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Tradition and role of SE Poland as the cradle of the world oil industry

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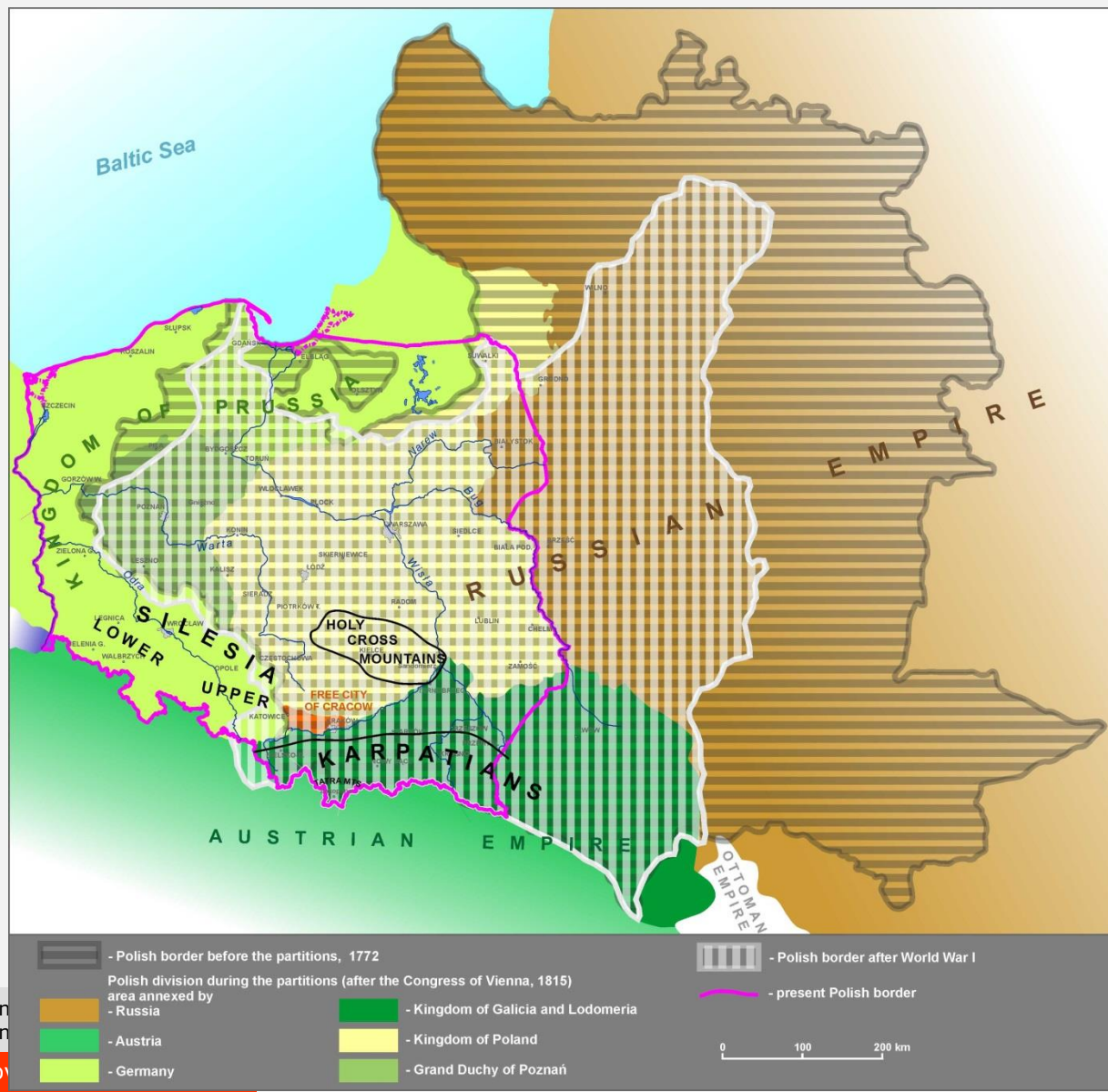
**III Meeting of Polish Comm. On the History of
Geological Sciences, Polish Geological Society
18 September 2015, Warsaw**

Agenda

- Milestones in history of Poland in 19th c.;
- The earliest printed reference to rock oil;
- Knowledge of oil and its uses in 18th to mid-19th century;
- Who was the first to distill kerosene?
- Oil boom at the turn of the 19th and the 20th centuries – from the Beskid Niski Range to Borysław Basin;
- World's leading oil experts of Polish origin;
- Proposal of Polish Commission on History of Geological Sciences



Sketch of the Polish borders from 1772 (before the partitions) to the present



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The earliest references to oil occurrences in area of Poland:

The 16th century chronicles describe a funny event from gold prospecting operations conducted by **Seweryn Boner** (1486-1549), a treasurer to the King Sigismund the Old. In 1530, prospecting excavations made in area of the Ropa (=oil in Polish) village under the slopes of Chełm Mount became flooded with rock oil. After that, Bonner became a target of humour at the King's court:

„He looked for gold in Ropa
to become doused in pitch”.



**Seweryn Boner tomb.
Mariacki Church, Cracow**

Krzysztof Kluk (1739-1796)

Catholic priest and notable naturalist, the author of several important books on wonders of nature and agriculture. The most important of those is multivolume „*Dictionary of Plants*”. He published also a two-volume book on mineral resources of Poland.



Krzysztof Kluk (1739-1796)

In his book on „*Mining matters, especially useful ones - exploration, recognition and utilization*” (1781, vol. 1, part IV), Krzysztof Kluk differentiated two classes of so-called earthy fats:

- **Class I, comprising liquids:** naphta (Lat. *naphtha*), rock oil (lat. *petroleum*), rock fat (Lat. *mumia*) and rock balsam (Lat. *bitumen*);
- **Class II, comprising compact materials:** “Jewish pitch” (*asphaltum*), jet (*gagas*), amber (Lat. *succinum*), ambra (Lat. *ambra*), kopal (Lat. *copal*), sulphur (Lat. *sulphur*), mineral coals (Lat. *lithantrax*) and peat (Lat. *turfa*).

He listed also numerous occurrences of these earthy fats, mainly in the Carpathians Flysch (south-eastern Poland).



Baltazar Hacquet (1739-1815)



**French naturalist and mineralogist,
Professor of Lvov and Cracow
Universitates**

Hacquet in his four-volume **"Neuste physikalisch-politische Reisen" (1791 – 1794)** described examples of oil seepages exploited at Nachajowice (present-day Ukraine). These seepages were exploited with digging of open-air pits a few meters, in which 15—20 workers were concentrating oil to a grease for axles of horse-drawn wagons.



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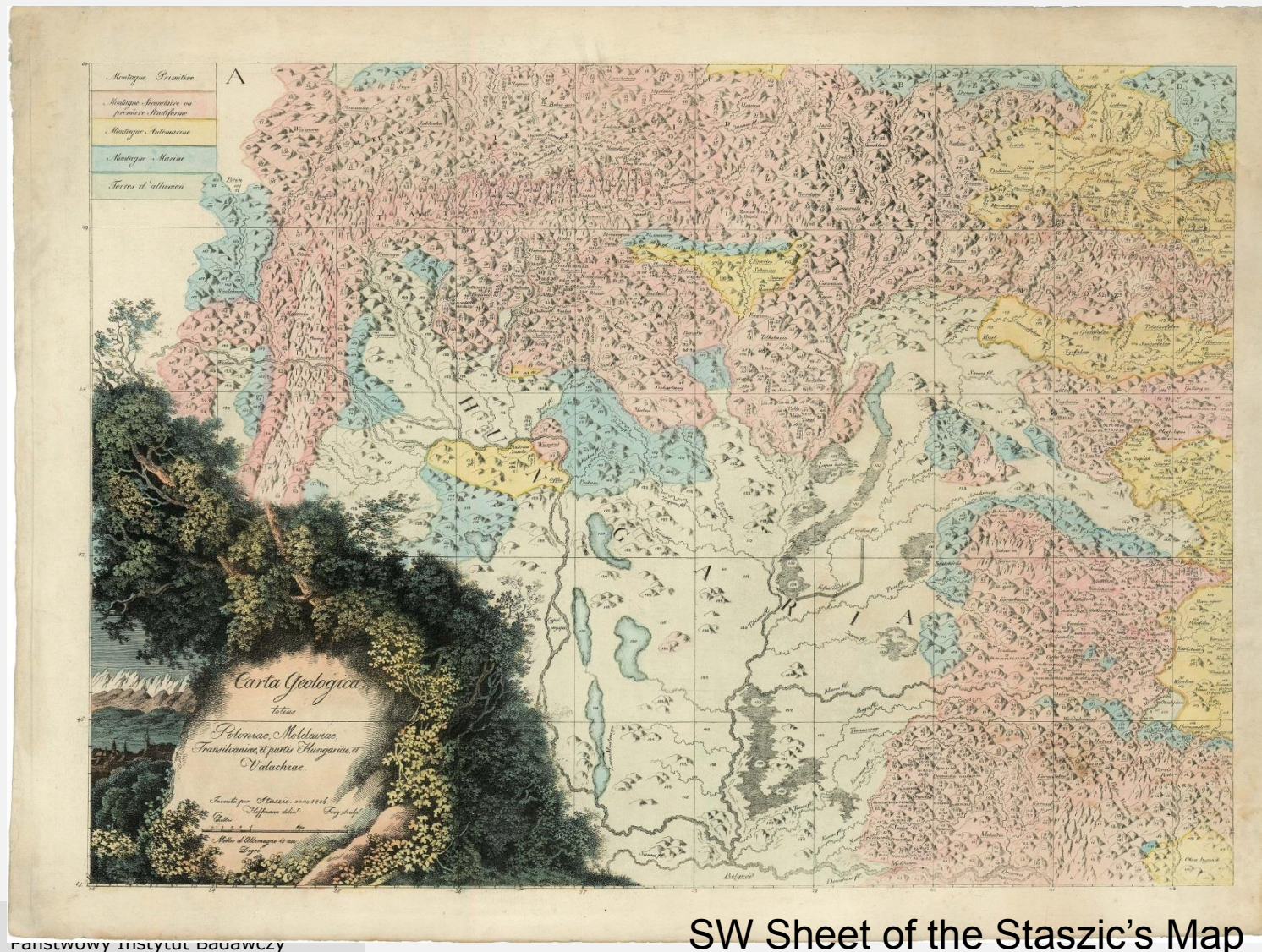
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Stanisław Staszic (1755-1826)

An outstanding activist of the Enlightenment in Poland, philosopher, political writer, journalist and naturalist. Minister of Education of the Kingdom of Poland. Staszic is seen as the father of Polish geology. He is the author of the first large book on geological structure of Poland - „*On the earth-formation of the Karpaty Mountains and other mountains and plains of Poland*” (1815).



Stanisław Staszic was also the author of a unique map entitled in 1815:
„**Geological Map**” - *Carta Geologica totius Poloniae, Moldaviae,
Transylvaniae, Hungariae et Valachiae*



SW Sheet of the Staszic's Map

Stanisław Staszic (1755-1826)

- In Part VIII of his monograph, widely recognized as the first extensive study of geology and mineral resources of Poland, Stanisław Staszic described pits exploiting “seeping rock oils”, along with techniques of exploitation and uses. These pits were to be over three fathoms (equaling around 6 m) deep.
- Staszic noted a close relationship between occurrences of “rock oils” and salts and brines.
- He noted occurrences of „rock oils” in vast areas stretching from Wieliczka near Cracow as far as Pokucie and Maramureș County (present-day in Romania).



Who was the first to distill kerosene?

In Poland we know that:

Ignacy Łukasiewicz (1822-1882) was the first in the world to distill clear kerosene from seep oil (invention patented in 1853). His achievements include the invention of the first modern kerosene lamp (1853).

But....



Who was the first to distill kerosene?

Canadians regard **Abraham Pineo Gesner** (1797-1864), a Canadian physician and geologist from Nova Scotia, as the man who invented kerosene. He developed a method to distill a product called kerosene from coal and patented it in 1846. In Canadian opinion, Ignacy Łukasiewicz was only an inventor of the first modern kerosene lamp.



Filip Neriusz Walter (1810-1847): He was the first!!

Filip Neriusz Walter (1810-1847), an outstanding Polish chemist born in Cracow, who established high position in French scientific circles in Paris. His main achievements were related to studies on products of distillation of plant resins, rock oil, waxes and plant oils. Most probably he should be given priority in discovery of method of distillation of rock oil and recognition of its properties as he did it around the year **1837**. He also discovered such compounds as toluene, nitrotoluene and biphenyl.



Time of rapid development of oil industry

When first oil well in United States was drilled at Titusville (Pennsylvania) in 1859, about 30 oil wells were in operation in the Borysław area and seeping oil was also exploited throughout the Galician region in dozens of wood cased pits, that is wells down to about 20 m deep.

**Oil well „Anna”
from 1854.–
Lipinki
near/Gorlice.**

Photo 2014





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**Oil pump on borehole Lipa 1 drilled in 1860.
Lipinki near/Gorlice. Photo -2014**

Władysław Długosz (1864-1937) – first Polish oil driller and the man who discovered the Borysław oil field

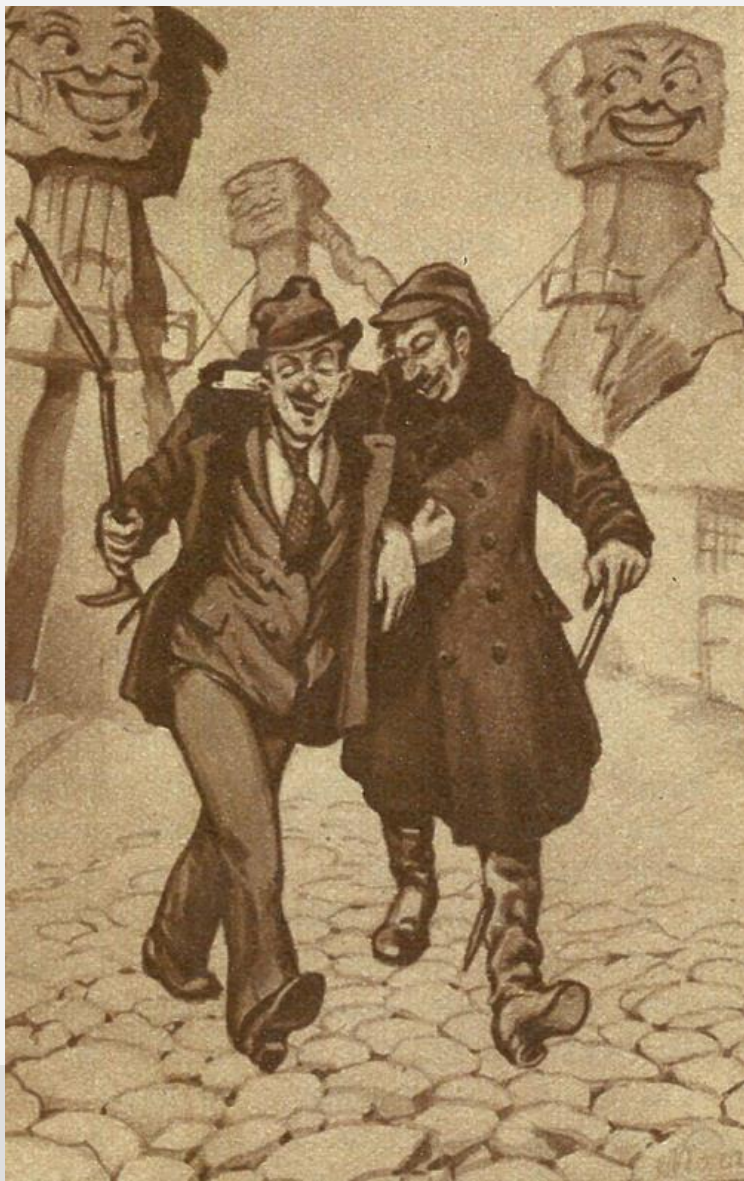


- 1896 r. – „*Na Potoku*” borehole – oil production of 40 tons/24 h; introduction of iron drilling rods for the first time in oil industry
- 1904 r – „*Wilno*” borehole – production of 400 tons/24 h,
- „*Litwa*” borehole – production of 800 tons/24 h,
- 1908 – „*Oil City*” borehole at Tustanowice with production of 2500 tons/24 h – the highest in the Borysław oil field



Social contrasts in the *Polish Klondike* as the Galician Oil Basin used to be called:

Cartoons showing drunk rich owners of oil fields at the background of smiling oil wells and a poor worker sweeping streams of crude oil with a broom.



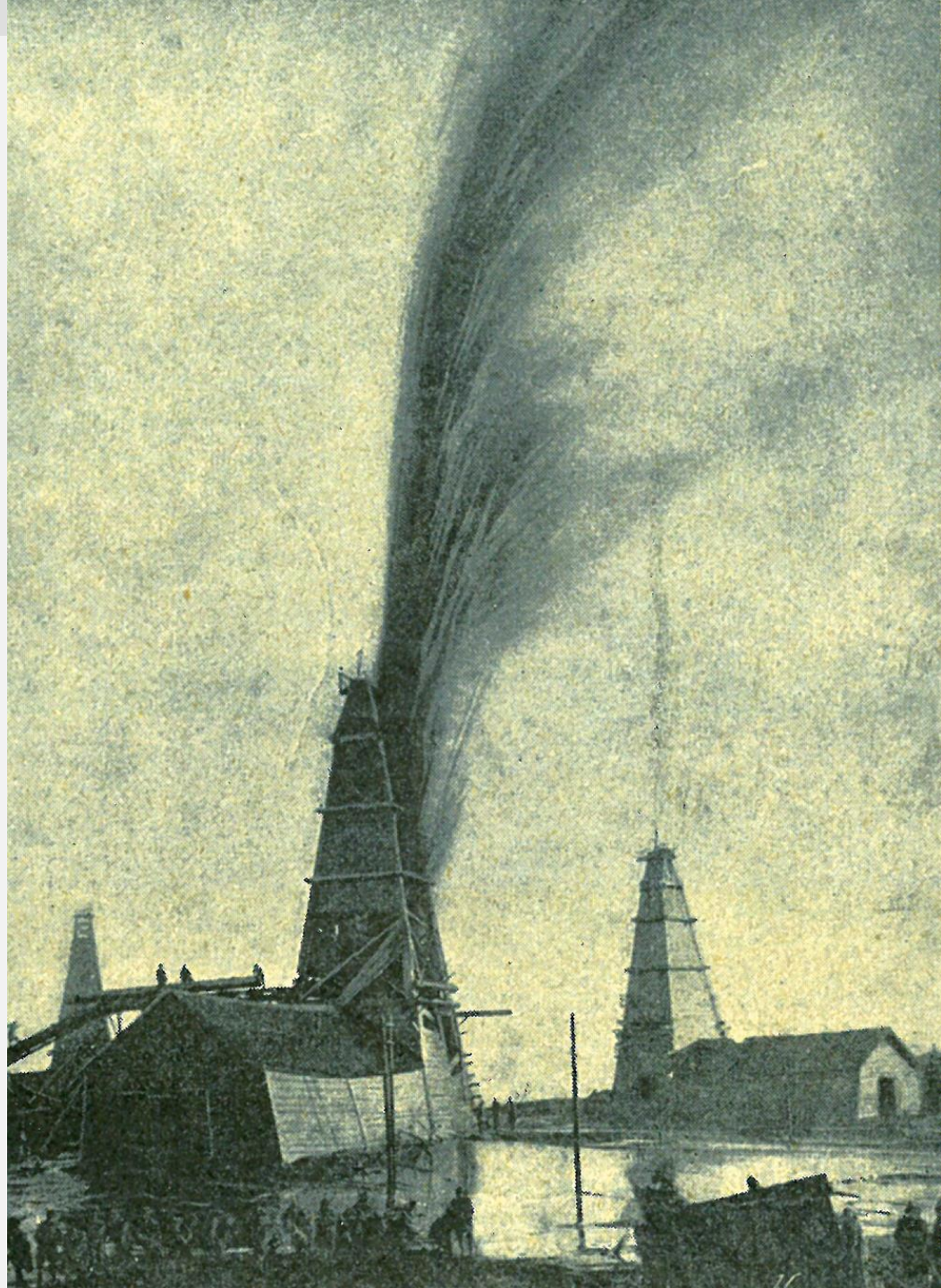
Rig fires were a fairly common sight at these times also in Galicia. The largest fire was that of „Oil City” well, raging for 6 weeks in 1908.



„Oil Fountain”

Photo from Magazine
„Tygodnik Ilustrowany”

Warsaw, 1899.



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Destruction of oil fields was one of methods to achieve a military advantage during the First World War. An illustration from German *Illustrierte Zeitung* from 1915 shows wild fires of oil rigs in the Borysław Basin



Polish oil geologists from the turn of the 19th and 20th centuries – leading world experts

Rudolf Zuber (1858 - 1920) - a leading petroleum geologist, author of a monumental monograph “*Oil and Flysch*” and numerous papers on oil fields of Poland and other countries and co-founder of monumental Geological Atlas of Galicia. From 1886 to 1913, he worked as an expert in Argentina, Bolivia, Chile, Venezuela, Caucasus, Romania, Spain, Mexico, Canada, USA, Trinidad, Nigeria, Ghana, Ivory Coast, Western Guinea and India (Pendjab).



Polis oil geologists from the turn of the 19th and 20th centuries – leading world experts

Władysław Szajnocha (1858 – 1928) – author of monographs *Mineral Springs of Galicia* (1891) and „*Mineral Resources of Galicia* (1893-1894) and many other papers. He studied oil fields in Central Asia, Austria, Norway and Sweden.



WŁADYSŁAW SZAJNOCHA. Fotografia ze zbiorów Muzeum Uniwersytetu Jagiellońskiego w Krakowie



Polis oil geologists from the turn of the 19th and 20th centuries – leading world experts



Józef Grzybowski (1869 – 1922) – author of about 30 papers on geology of the Carpathian Mts and oil prospecting, founder of micropaleontology applied to stratigraphy of oil-bearing rock series in petroleum geology; founder of the Geological Station in Borysław in 1912.



Polis oil geologists from the turn of the 19th and 20th centuries – leading world experts

Emil Habdank-Dunikowski (1855 – 1924) – highly appreciated for his studies on oil fields in the Bieszczady Range (Carpathian Mts), co-author of monumental Geological Atlas of Galicia, oil expert working in Algieria, Tunisia, USA and Mexico. Made a fortune and was the owner of one of the most beautiful palace in Lviv at the turn of the 19th and 20th centuries.



Polis oil geologists from the turn of the 19th and 20th centuries – leading world experts



Józef Zwierzycki (1888 – 1961) – Exceptionally talented and versatile geologist. In 1914-1938, he worked for the geological survey of the Dutch East Indies (nowadays Indonesia), to become its director (1933-1938). He conducted studies in Sumatra, Java, Celebes, Borneo and New Guinea, primarily aimed at oil prospecting and production. When Germany invaded Poland in 1939, he was appointed director of the Polish Geological Institute in Warsaw because of his perfect knowledge of the German language and strong international recognition. He is regarded as co-discoverer of famous Polish copper deposits (Kupferschiefer Formation, Upper Permian).



Polish oil geologists from the turn of the 19th and 20th centuries – leading world experts

Wawrzyniec Teisseyre (1860 – 1939) – An outstanding and versatile geologist. The first to draw the course of SW boundary of the East-European Platform known nowadays as the Teisseyre-Tornquist Line. In 1895-1910 he conducted prospecting for oil in Romania to be awarded the Order of the Crown.



An open-air museum of the Cradle of the Petroleum Industry?

At present in areas of Polish part of the former Galician oil basin there are preserved dozens or even hundreds of elements or more or less complete original installations for oil production. Some of these installations still produce a few barrels of oil per week.



An open-air museum of the Cradle of the Petroleum Industry?

Polish Commission on History of Geological Sciences approached local authorities and the Polish Oil and Gas Company, which is the legal owner of these installations, with an initiative to establish a historical Geological-Industrial Park – an open-air museum of the Cradle of the Petroleum Industry.

We sincerely hope that in a few years we will be able to invite you to visit that Geological-Industrial Park.



Conclusion

- If someone will ask you:

Where is the Cradle of the World Petroleum Industry?

- There is only one correct answer

In South – Eastern Poland in Carpathians
Flysch!





**Here Ignacy
Łukasiewicz lighted
an oil lamp for the
first time.**

Gorlice - Zawodzie

**Thank you
for your attention**