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History of Petroleum and Natural Gas Exploration in Hungary from the Beginning till 1920

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Petroleum and natural gas have been known already since early historical times, yet it was not utilized in large scale before the mid-nineteenth century. Then came the technical revolution bringing with also the fast development of petroleum industry with DRAKE's drill in Pennsylvania (USA) as a start in 1859.

Oil and natural gas seepages were known also in Hungary since several centuries. They are first mentioned by cardinal M. OLÁH in his book: „Hungaria" published in 1536, and also by G. AGRICOLA in his book: „De natura fossilium libri X" published in 1546. The gas seepages in Transsylvania, especially those occurring around Magyarsáros and Bázna and called by the local population: „roarers" were first described by V. F. FRANKENSTEIN, royal judge at Nagyszeben (1690.). The burning natural gas seepages at Bázna are also described by General L. F. MARSIGLI, Italian scientist and military engineer, who visited Transsylvania in 1695, in his book: „Danubius pannonico–mysicus", published in 1726. J. EHRENREICH-FICHTEL, royal counsellor at Nagyszeben published his book: „Beitrag zur Mineralgeschichte von Siebenbürgen" in 1780 mentioning for the first time the petroleum seepages at Sósmező (Eastern-Carpathians). The crude oil occurring at Bányavár (Peklenica in Muraköz) is first examined and distilled by J. J. WINTERL, professor of chemistry at the university of Buda, in 1788. This was one of the earliest chemical analyses of crude oil in the world. The asphalt occurrences in Bihar county at Tataros–Derna are first described by K. A. ZIPSER („Versuch eines topographisch-mineralogischen Handbuches von Ungarn, 1817.") and by F. S. BEUDANT in his renowned book: „Voyage mineralogique et geologique en Hongrie" (1822.).

Petroleum exploration and exploitation began in Hungary around 1850, i.e.: some 125 years ago. The history of Hungarian hydrocarbon production, adjusted to some major political changes, can be divided into three major periods. The first period (1850–1920) includes the activity carried out over the area of historical Hungary till the end of World War I. The second period (1921-1945) is the time of activities concluded over the present area of Hungary and mainly by the help of foreign capital. The third period is a completely new chapter of Hungarian hydrocarbon production, beginning after World War II.

Exploration first began around 1850 in the vicinity of long before known oil and asphalt seepages in the Flysch of the Carpathians (e.g.: Sósmező in the Eastern-Carpathians); and in the Necgene basins of Muraköz and Croatia (e.g.: Bányavár=Peklenica).

The first period, expanding over nearly 70 years can be divided into two parts, from the economical point of view. The first half till 1893, is the period of

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random exploration, without any scientific knowledge, any technical competency, and any significant results, conducted by individual prospectors. This first sub-period may be called the epoch of pioneers. Especially the Carpathians were considered as most promising with respect to the succesful work completed in Galicia and Roumania. T. POSEWITZ, a geologist gives a first account of the conditions summarizing the results of exploration during the first 50 years in his book: „Petroleum and Asphalt in Hungary" (1906). According to him till 1880 small-scale prospectors were searching for oil by primitive methods, by hand dug shafts and only exceptionally by hand borings in the vicinity of surface seepages. The deepest wells reached 70 m, yielding a few barrels of petroleum. Some fields to be mentioned are: Mikova, Luh, Kőrösmező, Dragomérfalva, Sósmező, Zsibó, Bányavár, Mikleuska.

Between 1880—1893 the new customs law favourized indigenous petroleum production and refining. The situation improved somewhat; some companies were founded financed by banks, providing more capital. Technical knowledge also developed, yet results remained still rather unsatisfactory. Technical know-how was first imported. Several Polish, and Austrian geologists, mining engineers took part in geological mapping, or rendered consulting services. Drillers came mainly from Galicia. The first American drilling rig was imported in 1881. The number of wells reached some 140, the deepest being some 600 m (Ludbreg-Croatia). The most important new exploration areas being: Zemplén, Izaszacsal, Recsk, Szelence and Ludbreg. Two other petroleum occurrences of different character shall be mentioned in addition: the asphaltic oil-sand deposits in the Upper-Pannonian at Tataros—Derna (Bihar County), and the Jurassic bituminous shales at Stájerlakanina (Transsylvania). Oil was produced at both places between 1850—1920. According to POSEWITZ about 90% of Hungarian petroleum production came from this areas till 1906.

1893 represents the beginning of a new period in indigenous petroleum exploration. The government decided to support the individual prospectors, but at the same time the Hungarian Royal Geological Institute, established in 1869 was charged with the direction and control of the activity under the geologist J. BÖCKH, director of the institute. J. BÖCKH and his geologists performed the geological mapping of the most important areas and their petroleum-geological interpretation. Unfortunately the results could not be improved even by governmental support, yet the scientific principles of petroleum exploration and the science of petroleum-geology have been developed also in Hungary. During this period some 81 wells were completed, the deepest reaching 1070 m (Szukó in the Northern-Carpatians). With respect to the unsatisfactory results J. BÖCKH suggested in 1906 that petroleum exploration should be carried out by the State. His views and suggestions were published in his book: „Recent Status of Petroleum Exploration in the States of the Hungarian Holy Crown" (1908). In consequence governmental support was withdrawn and national take over was decided on. This decision was promoted to a great extent by the discovery of big amounts of natural gas in Transsylvania in 1909. The State monopolized the petroleum and natural gas by the Mining Law No. VI./1911.

The last and most successful chapter of the first period began in 1907. According to some suggestions by L. LÓCZY SEN., Professor in Geology, exploration for Potassium salts was started by the Hungarian Fiscus in the Transsylvanian-Basin in 1907. The Kissármás No. 2. well located by L. LÓCZY and K. PAPP to explore Potassium salt deposits, discovered in 1909 a huge gas field, the biggest

in Europe at that time. To exploit this unexpected result the Fiscus asked H. Böckh, geologist and professor at the Mining-Academy at Selmecbánya to organize and to carry out systematic prospecting in the Transsylvanian-Basin by geological mapping and drilling. The most prominent Hungarian geologists were involved in this large scale work rendering solid and reliable data for the drilling program, started by F. Bőhm, a mining engineer.

Summarizing the results: H. Böckh and his men, applying the well known „anticline theory" stated the folded structure of the Neogene basin mapping 36 sealed anticlines (brachyanticline). Till the end of 1918 some 38 exploration wells were drilled in a total length of 9 500 m. Depths varied between 100 to 1282 m. Natural gas is stored in numerous sand/sandstone layers of Sarmatian and Tortonian (Miocene) age. Methane makes 99% of the gas. Local marketing began very soon and in 1916 the Hungarian Natural Gas Company was established with foreign capital to start the development of the Hungarian gas industry. The farsighted plans were interrupted by the end of World War I.

The geologist team headed by H. Böckh achieved some more success also in other parts of the country, having discovered the oil and gas field at Egbell (Gbely, now in Czechoslovakia) in 1914, and an other oil and gasfield at Bujavica (Croatia) in 1918.

Between 1907—1920 altogether some 276 wells were completed, the deepest of them reaching 1282 m (Marosugra in the Transsylvanian-Basin).

The structure at Egbell, showing also some hydrocarbon seepages, was mapped by S. Papp and oil was discovered in shallow depth (163.5 m) by well No. 1. located by H. Böckh, and V. Lázár. The reservoir is in Sarmatian sandstone layers. This discovery gave impetus to petroleum exploration in the Vienna-basin some 20 years later. Thus,Egbell was the first sistematically explored oil field in historical Hungary.

Above results could not be fully exploited by the Hungarian government, since all these areas were detached form Hungary by the Trianon Peace Treaty after World War I. This marks the end of the first period on the history of petroleum in Hungary.

While interpreting the first period, three areas should be specially considered reflecting the conceptions and principles of contemporary exploration: Izaszacsal, the Transsylvanian-Basin, and Egbell.

At the end of the 19th century it was generally accepted that exploration should be concentrated on the Carpathians due to some good seepages in the Iza-Valley (Máramaros county) and to numerous oil fields in the Flysch-zone of the Outer-Carpathians producing in Galicia and Roumania. No attention was given whatever to the basin areas of the country from the point of view of petroleum exploration. Several geological maps, geological data, geological studies were available already at that time about the Carpathians; even J. Böckh himself ascribed the greatest perspectivity to the Izaszacsal area. However, the results were very poor because the conditions of oil and gas accumulation could not be easily recognized at the given very complicated tectonical circumstances.

Making use of his experience gained in the Transsylvanian-Basin, H. Böckh was the first to recognize that petroleum exploration in the Inner-Carpathians was a misconception. It was he, who, correctly, called the attention to the young (Neogene) basin fillings. As early as 1911 he declared that the results obtained in the Transsylvanian-Basin, the numerous traces of hydrocarbons at

the eastern margin of the Great Hungarian Plain as well as the Derna — Tataros asphalt occurrence justify petroleum and gas exploration in the Great Plain. H. BÖCKH was in possession of a novel method, technique indispensable for the exploration of deep basins. This was the torsion balance invented by the Hungarian physicst R. EÖTVÖS. In fact, H. BÖCKH was the first in the world to apply the torsion balance to petroleum exploration — in 1915, on the Egbell field discovered in the provious year. He proved succesfully that this instrument is appropriate to detect such structures which may be hydrocarbon reservoirs. This was the very beginning of geophysical method in oil and gas exploration.

Postwar conditions confined Hungarian petroleum exploration to the remaining areas, most of them being covered by the sediments of the Great and Little Hungarian Plains.

In 1917 torsion balance measurements were started over the NE part of the Great Hungarian Plain, initiated by H. BÖCKH, putting in charge D. PEKÁR, one of the fellow-researchers of R. EÖTVÖS.

Based upon the results of above geophysical measurements the exploration drilling Nagyhortobágy No.-1. was located by H. BÖCKH and S. PAPP in 1918, beginning the exploration for hydrocarbons in the Great-Plain. This marks at the same time the beginning of the next period.

While reviewing the first period of the history of Hungarian oil and gas exploration we can recognize several great characters of geological science in Hungary: J. BÖCKH being the first to apply scientific principles in Hungarian petroleum exploration, L. LÓCZY, SEN. iniciating Potassium-salt prospecting in the Transsylvanian-Basin and K. PAPP. playing a decisive role in Transsylvanian natural-gas prospecting. H. BÖCKH is the best known pioneer of Hungarian petroleum exploration, considered by the Hungarians as the father of Hungarian petroleum exploration. Under his leadership and management excellent prospecting team was developed, conssiting of geologists, geophysicists and engineers. This formed the nucleus of the second generation, of which especially S. PAPP, and F. PÁVAY-VAJNA became outstanding during the next period between the two World Wars.