

## Some data to the history of Hungarian petroleum exploration between 1920–1945.

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By the Trianon peace treaty following World War I. Hungary lost two third of her territory. Most of the remaining area is underlain by 500 to 6000 meters of Tertiary strata in interconnected basins, geologically scarcely known at that time. About the geological sequence in the Great Hungarian Plain sparse information was obtained by some relatively shallow artesian wells. Yet Hungarian geologists were confident to find hydrocarbons as it is shown by contemporary literature.

Because all drilling equipment were lost in the detached areas, and also no money was available, the only way left was to call foreign capital to help. On the 20th, October, 1920 a contract was signed with the Anglo–Persian Oil Company to form an affiliate called Hungarian British Mineral Oil and Natural Gas Company. Anglo–Persian conducted some prospecting also before in the Iza-valley and in Muraköz. Managers of the new company were Major L. W. BIRD, and Ministerial counsellor F. БОРМ. Head of the geological team consisting of the geologists S. PAPP, F. PÁVAY-VAJNA, A. VENDL and D. PANTÓ, was H. БӨККН.

The company spent some 150 000 for exploration, though devaluated by some 35% due to heavy inflation. Only three wells were drilled: Budafa-1, Kurd-1, and Baja-1, in addition to geological mapping and gravity-mesaurements.

By actual standards the work of the company can be considered but some kind of general surveying due to very poor preparatory work. Anyway it is irony of fate that the well Budafa No-1. missed the in 1937 discovered oil field only by a few hundreded meters.

Some politicians objected the calling in of foreign capital, though the activity of Anglo–Persian promoted the development of Hungarian hydrocarbon prospecting and also the specialists of Anglo–Persian got acquainted with the practical application of the torsion balance in petroleum prospecting. It is interesting to mention the letter of L. W. BIRD, dated on the 8th, May, 1921, asking for information about the torsion balance. Following, the method was studied by J. C. TEMPLETON and by the American geophysicist D. C. BARTON having purchased also some instruments. During the following years the EÖT-vös-instrument was widely used world over till 1928, when it was gradually replaced by the gravity meter. When the activity of Anglo–Persian ceased in Hungary, some of the Hungarian geophysicists, geologists and engineers had a chance to accept assignments abroad. Many of them worked in the U.S.A., Canada, Venezuela, Chile, Italy, Albania, Persia, India and in the Far-East.

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Eötvös, as a scientist did not protect the torsion balance by patents and gave a licence to the „Askania Werke G.m.b.H.”, Berlin, to manufacture the balances, thus giving away all material benefits of his invention.

The Hungarian affiliate of Anglo—Persian ceased functioning in 1923, and gave up her concessional rights in 1926. From this year on petroleum exploration was continued by the Hungarian Fiscus only, and in small scale. Some exploratory drillings were sunk on the „gaseous areas” of the Great Hungarian Plain in the surroundings of Hortobágy, Hajdúszoboszló, Karcag, Debrecen, Tiszaórs, Tisztaberek, yielding mainly hot artesian water and some natural gas. The wells were located generally on positive gravitational anomalies and on brachyantoclines mapped by surface, or near surface dip-measurements in hand dug shallow shafts.

Being the efforts unsatisfactory over the Great Plain, exploration was shifted to the foot hills on the Northern border of the Great Plain, offering better conditions for the application of surface mapping methods. The decision was made by Prof. K. TELEGDY-ROTH. Soon Z. SCHRÉTER mapped a promising structure in the vicinity of Bükkszék and already the first two wells yielded some crude oil. By further wells the structure was proved to be strongly fractured with only poor petroleum accumulations, preventing large scale exploitation.

Exploration was interrupted in Transdanubia for some ten years. It was assumed again when a contract was signed on the 28th, July, 1933 with the European Gas and Electric Company (EUROGASCO). Exploration began with up to date equipment, scientific methods and with sufficient capital funds, and with an excellent team, consisting of A. VENDL, L. LÓCZY, JR; M. KRETZOI, L. STRAUSZ geologists, and V. SCHEFFER, SZ. OSZLACZKY, L. FACSNAY, I. EGYED geophysicists, headed by the then well experienced S. PAPP, who served meanwhile in many countries abroad.

The petroleum possibilities in Transdanubia were first summarized by F. PÁVAY-VAJNA in his partly published, partly unpublished reports (1925, 1927, 1930). In his opinion Neogene sediments are slightly folded in Transdanubia and contain hydrocarbons similarly to the Neogene sediments in Transsylvania and Croatia. This opinion was generally accepted, only the way how to locate these folds were much discussed upon.

The Budafa anticline was fairly proved by some surface dip measurements. The strongly dissected geomorphological shape of the terrain set heavy obstacles to the application of modern geophysical methods.

Budafa was proved in 1937 as the first prolific oil field in Hungary and the rights of EUROGASCO were transferred to the Hungarian—American Petroleum Industrial Company (MAORT) an affiliate of Standard Oil Company of New-Jersey (U.S.A.). Soon Lovászi oil field was discovered (1940), followed by Hahót, Pusztaszentlászló and Ederics.

The Germans, realizing the successes of MAORT requested concessional rights for the territory of the country outside the MAORT concession. After long and complicated negotiations a consortium consisting of five German companies and headed by Wintershall A.G. obtained concessional rights for the SE-ern part of the Great Hungarian Plain on the 26th, August, 1940. Soon this rights were transferred to the Hungarian—German Mineral Oil Works, Ltd. (MANÁT), an affiliate of the above consortium.

After some areas of historical Hungary were rejoined with Hungary, also

the Italians (an other member of the Axis powers) obtained some concessional rights in the Carpathians and Muraköz. Exploration was carried out by the Italian—German Mineral Oil Industrial Company (ONÁRT).

Exploration on the MANÁT concession was carried out with the most modern methods then available. In addition to torsion balance and magnetic measurements the total area (including the later added Bácska and part of Bánság) was covered by gravity meter measurements. On the most prominent gravitational anomalies up-to-date seismic measurements were completed yielding some reliable results. Also some shallow structural drillings of continuous coring (counter-flush) were employed. Geophysical prospecting was carried out by the Hungarian Royal R. Eötvös Geophysical Institute (torsion balance, magnetic, and some experimental seismic measurements), and by SEISMOS G.m.b.H and PRAKLA, both Germans (seismic and gravity-meter measurements). Well logging was completed by the Schlumberger Company (working also for MAORT). In the interpretation of sample materials also the Hungarian Royal Geological Institute and the Geological departments of some universities took part. At the hight of the activity 3 medium heavy, and 1 heavy drilling rigs were active having completed 26 deep wells in a total length of 35000 m. In addition a number of shallow wells were completed with two light drilling rigs. The structures Tótkomlós—Battonya, Biharnagybajom, Körösszegapáti, Kismarja and Ferenczállás (Algyő) were outlined and in addition a number of shallow structures in Bácska and Bánság. Some oil and big amount of natural gas was discovered at Tótkomlós and Körösszegapáti, and some nat-gas indications at Ferenczállás. MANÁT spent altogether some DM 30 million for exploration. These results lead to the discovery of significant oil and gas pools in the area after World War II.

The greatest achievement during the decades between the two World Wars was the development of up-to-date geological and geophysical principles, their proper interpretation and application for the discovery of hydrocarbons in the Tertiary basins of the country.

Relating the geological conception the most important development is the possibility to determine the big units of migration and accumulation. In each unit the source area of migration and the regional zones of accumulation can be outlined. The indication of accumulation zones promotes the concentration of exploration on the most promising areas.

The Hungarian oil men, working between the two World Wars proved, that despite extremely hard geological conditions good results could be obtained also in the area of post-war Hungary, by systematic, up-to-date exploration based on proper scientific principles.