POSSIBLE HORIZONS FOR OIL AND GAS IN NORTHEASTERN ILLINOIS

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During the last twenty months an interest in drilling for oil and gas has developed in several places in the northeastern part of the state. Companies have been organized, leases have been taken, and some actual drilling has been done. The greatest interest has been near the northern edge of Cook County, the southern edge of Lake County, and in western McHenry County. It consequently seems proper on this occasion to outline briefly the horizons in which there is a possibility of the occurrence of oil or gas. Beginning with the latest formations, these horizons may be listed as follows:

1. *Glacial Drift.* Lying below the most recent or Wisconsin drift there is frequently an old soil zone or a zone containing large amounts of vegetable material, especially remains of trees. Probably more than one such horizon is present in some localities. Wells have been sunk to one of these zones rich in organic matter, and gas has been obtained from a great many such wells. The gas pressure at first is occasionally quite strong, but usually soon declines so that it is only a few pounds per square inch and eventually this pressure may disappear altogether. However, in a number of places such gas wells have furnished and undoubtedly will continue to furnish for years to come local supplies which can be used in farm houses or possibly in small communities. Showings of oil in these same horizons have also been reported.

2. *Devonian Shales.* In a few places in the eastern part of the state, either in cracks in the Niagara limestone or in small masses probably detached in the drift, remains of Devonian black shale occur. This shale is frequently highly carbonaceous and might form a source for oil or gas, but the lack of any extensive bodies of this material under a suitable non-porous cover makes it im-

probable that oil and gas will be obtained from this horizon.

3. *Niagara Limestone.* In a number of localities small asphaltic residues have been found in the more porous parts of the Niagara limestone, especially near its top, and in certain places wells have encountered considerable pockets of gas and sometimes a little oil in the bottom of the drift and in the top of this limestone. In places the oil is sufficient in amount to spoil water wells, but has not been found in sufficient quantity for economic use. Early reports of borings in the Niagara limestone state that a few barrels of oil were obtained from that formation. Locally a thin sandstone may occur at the base of the Niagara, and this is a possible oil and gas horizon.

4. *Maquoketa Shale.* While this formation is composed largely of clayey shales passing into impure limestones, in a few horizons small carbonaceous layers have been reported, and a few well borings have reported some oil showings in these shales.

5. *Galena Dolomite.* This heavy dolomitic formation underlies the northeastern portion of the state and has been penetrated by many wells. Only a few very meagre oil showings have been reported from this horizon. However, in the northwestern part of the state, i. e., in the upper Mississippi Valley lead and zinc district, at the very base of the Galena dolomite is a peculiar chocolate-colored shale known locally as the "oil rock". This is very rich in carbonaceous material,—in fact from it oil and gas can be distilled and dry splinters of the shale burn with a smoky flame. This peculiar carbonaceous shale is confined mainly to the lead and zinc district and exists, if at all, only in small quantities in the northeastern part of the state. There is still a possibility, but not a probability, that thicknesses of this material sufficient to furnish small supplies of oil and gas may be found in that part of the state.

6. *Platteville Limestone.* The upper part of this formation in the northwestern part of the state also sometimes contains very thin seams of the oil rock, while the lower part of the formation is dolomitic and more porous. Rocks of this same age have furnished large quantities of oil and gas in both Indiana and Ohio, but not in Illinois.

Geological Structure. The northeastern part of the state consists of a low monocline dipping very gently to the east or a little south of east, and is the eastern limb of the main structural axis of the state, i. e., the LaSalle anticline. Local irregularities may, and probably do, occur in this monocline, but in order to furnish proper structures for the accumulation of oil and gas there should be well defined domes. While such structures may possibly exist, they have not yet been found and their locations, if they do occur, would be attended with much difficulty and uncertainty because of the heavy covering of drift in most of the district. Sandstone lenses would also be very difficult to locate.

Well borings. Mention has already been made of a number of shallow wells which have obtained gas from the glacial drift or from the upper part of the Niagara limestone. Large numbers of deep borings for artesian water both to the St. Peter sandstone and the Potsdam sandstone,—the two main aquifiers of the district,—have been made. Many of these wells have penetrated one or more of the horizons noted above, and most of these wells furnish fresh water of good quality, while a few are somewhat charged with salts, but none have found the decidedly briny waters which are so commonly associated with oil and gas.

SUMMARY

Summing up the above, it may be said that small local supplies of gas can be looked for in the drift and in the upper part of, and perhaps at the base of, the Niagara limestone, but the chances of finding large amounts of either oil or gas in these horizons are not encouraging.

While possibly structures favorable to the accumulation of oil and gas may be found in the northeastern part of the state, the chances of locating such structures are small and there is no convincing evidence that such structures, if located, would carry considerable quantities of either oil or gas. Thus the district as a whole offers very little encouragement to prospecting for oil and gas, and the chances for success in such prospecting are very small, while the chances for failure are very large.