The Question of Geological Exploration of Precambrian Crystalline Rocks
(Kuybyshev Region)

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The possibility of oil pools in crystalline rocks is examined. To be considered here are the results from Minnibayevo well 20,000, which is located in the Romashkino oil field on the Tatar arch. This well bottomed at 5099 m after having passed through 1884 m of the sedimentary cover and 3215 m of Archean crystallines. Flows of water were recovered from fracture zones in the 2531-2537, 3077-3078, and 4500-5099 m depth intervals. The waters in the crystalline basement are the same chemically as those of the sedimentary cover. The Kola super-deep hole has penetrated intervals of fractured rock in the crystalline basement that contain highly metamorphosed waters and dissolved gases. Both hydrocarbon and inert gases are present.

A very important factor for any accumulation of hydrocarbons in the crystalline basement would be a zone of cementation close to the basement surface which could act as a seal. Such seals in Venezuela and California control oil pools. The zone of cementation in Minnibayevo well 20,000 is comparatively thin. 30 m according to the acoustic log and 150-200 m according to cores.

A map was compiled showing thickness of the zone of cementation in the Kuybyshev region. See Fig. 1. In the central part of this region is a broad arch 100 km in diameter. The zone thickens in all directions outward from this arch. Further seismic surveys are recommended, to be followed by deep drilling to evaluate possibilities for oil and gas.