Relationship of Structural Plans on the Astrakhan Arch

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The Astrakhan arch is located in the southwest part of the Peri-Caspian depression. Commercial flows of gas condensate have been recovered here from Middle Carboniferous limestones.

In the sedimentary cover are two structural stages: subsalt, composed of a thick Paleozoic section; and a halogen-clastic section from the Kungur to the Quaternary, inclusively. This upper stage is divided into three parts: Permo-Triassic, Jurassic-Paleogene, and upper Pliocene-Quaternary.

The Astrakhan arch is 175 by 150 km and is complicated by highs that are 10-15 by 4-10 km with closures of 100-300 m. Salt tectonics has been more intensive in the north than in the south. See Fig. 1.

A series of structural maps of various stratigraphic levels in the supra-salt complex were compared with the surface of the Bashkirian limestones. The structure of the sub-salt sediments is in good agreement with that of the Akchagyl stage.

The degree of inheritance of structures was analyzed by computer processing, and a coefficient of correlation was determined between horizon P\textsubscript{2} (Upper Permian) and the Jurassic, Aptian, Upper Cretaceous seismic horizon, and Akchagyl stage. See Fig. 2.

The coefficient of correlation in the zone of intensive manifestation of salt tectonics is negative, indicating a reverse convergence (i.e., divergence) of structural plans of the sub-salt and the Meso-Cenozoic sediments.

Structures in the Akchagyl can be used as a guide to finding corresponding highs in the sub-salt sediments.