Buried Oil-Gas Traps in the Volgograd Region

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The Volgograd region is located on the southeast margin of the Russian platform of the European craton. See Fig. 1. It is on the southeast flank of the Voronezh regional high, and within it is the Lower Volga oil-gas region, a part of the Volga-Ural oil-gas province.

Two large structural stages are present. The upper includes sediments of the Mesozoic, Carboniferous, and part of the Upper Devonian. Within it are present largely inversion structures. The lower structural stage includes the lower Frasnian and Middle Devonian and is characterized by inherited forms. The following are general conclusions with respect to these stages.

1. There is a practically complete correspondence in outlines of tectonic elements recognized in the upper and lower structural stages. Downwarps and depressions in the lower stage correspond with positive elements in the upper. Highs on the lower stage do not have a clear reflection on the upper and are in this respect buried.

2. The main structural elements of the sedimentary cover are linear dislocations - flexures, at the crests of which occur all the local highs. There are ancient flexures which correspond in plan with young flexures having the opposite inclination. Associated with these are all the presently known oil and gas deposits in the sediments of the Carboniferous and clastic Devonian. There are other ancient flexures which are buried and are not reflected in the upper structural stage.

3. The transition complex between the two structural stages is largely upper-middle Frasnian. It is characterized by gradual attenuation of inversion elements downward along the section and subsequent appearance of structural forms of the lower stage and their intensification with depth.

4. Using these relationships, detailed study of the upper stage gives information on the lower.

Paleotectonic analysis now has permitted the recognition of Devonian, Late Paleozoic, Late Permian-Mesozoic, and Cenozoic-Recent stages in the geologic history of the region.

The Devonian stage was characterized by intense differential tectonic movements, reaching a maximum in the last part of middle Frasnian time. The Late Paleozoic stage, beginning with the Famennian, was a time of abrupt attenuation of the differentiated tectonic movements. Such movements were not renewed during the Carboniferous and into the Permian. Then differential movements again took place during the Late Permian-Mesozoic stage. During the Cenozoic-Recent stage, small highs coalesced into broad highs and small lows into large ones.