

Surface structures are known, especially in the western part of the state, and also around the Black Hills and along the Missouri River. Some structures have been drilled.

In comparison with the great potential area for oil finding in South Dakota, only scattered drilling has so far been accomplished, and few wells have tested the deeper possible oil and gas zones.

At present more wells are being drilled, seismic information is being accumulated, and surface parties are evaluating the areas of exposed Cretaceous and Tertiary rocks. Interest is high and this frontier may soon become another oil state.

13. SWEETGRASS ARCH, GEOLOGIC FRONTIER.

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The Kevin-Sunburst, Pondera, Cut Bank, and Bannatyne oil fields are located along or across some part of the Sweetgrass arch. Oil has been produced from these fields since the 1920's. Relatively little is known and clearly understood of the importance stratigraphy and subsurface geology play in the accumulations of oil and gas in this province. Numerous wells have been drilled and are still being drilled in the continued search for oil and gas in this area. However, few electric or radioactive logs are run and few if any samples of the cuttings are taken for geologic study. Consequently, much valuable geologic information is going to waste.

East-west stratigraphic cross sections show a pre-Middle Jurassic positive area east of the present Sweetgrass arch in the Chinook-Bearpaw mountain area. Between Middle and Upper Jurassic time

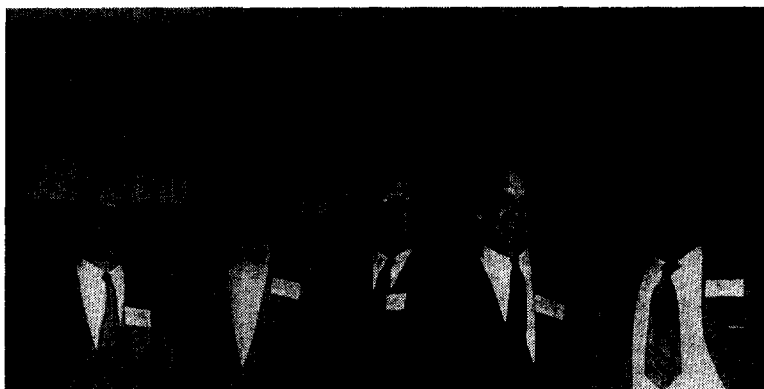


FIG. 2.—Radio-panel members: E. W. ELLSWORTH, business manager, A.A.P.G., Tulsa; FRANK D. GORHAM, JR., Pubco Development, Inc., Albuquerque; A. I. LEVORSEN, Tulsa; MAURY GOODIN, Petroleum Information, Denver; SHERMAN A. WENGERD, University of New Mexico, Albuquerque.

this positive area was depressed and the Belt Island positive area came into being. The present northwestward plunge of the Sweetgrass arch was probably established at this time.

Periods of erosion and truncation of sediments followed by redeposition have caused numerous wedge belts of porosity in sediments from Lower Mississippian to Lower Cretaceous. Changes in facies from the predominantly clastic sediments of the Big Snowy group (Upper Mississippian) into the limestone and dolomites of the miogeosyncline west to the present Sweetgrass arch offer multiple stratigraphic trap possibilities for the accumulation of oil and gas. Relatively little has been done to explore these stratigraphic traps or wedge belts. The wedge edge of the Middle Jurassic Sawtooth sandstone and limestone remains unexplored. Changes in tilt and hydraulic gradient may have caused oil accumulation off the top of structurally high areas forcing a re-evaluation of formerly condemned structures. The area is further complicated by thrust faulting along its western margins.

The Sweetgrass arch area offers a challenge to the petroleum geologist to solve its stratigraphic and structural complexities. Rewards will be high—the oil is here, find it!

14. CEDAR CREEK ANTICLINE, EASTERN MONTANA.

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The Cedar Creek anticline is an elongate northwest trending flexure approximately 100 miles long and 10 miles wide located in eastern Montana on the northwest flank of the Williston basin.

As expressed in surface beds of Upper Cretaceous age, the structure is an asymmetric fold with