

outlines of the depression may have been formed in Miocene(?) time, but its present configuration is chiefly the result of late Pliocene(?) deformation. Structurally, the depression is a series of north-trending grabens arranged en echelon north-northeasterly.

Slides showing possible thickness and distribution of the Cambrian-Ordovician-Silurian, Devonian-Mississippian, Pennsylvanian, Permian, and Triassic-Jurassic-Upper Cretaceous in the area are presented; also a schematic stratigraphic section north-south across the area and a map showing Laramide and younger tectonic features.

#### 6. SIGNIFICANT EXPLORATORY DEVELOPMENTS OF 1953.

PHILIP C. INGALLS, Socony-Vacuum Oil Company, New York City.

Within the United States there are extensive little-tested areas believed to offer untold potentialities for the development of truly big oil and gas production. Outstanding in this respect are the Rocky Mountains, the Great Plains, and the southeastern states. But not to be overlooked are the apparently thoroughly prospected areas with "bottomless" sedimentary basins, and areas where complex faulting, numerous wedge-outs, or rapid lateral facies changes have slowed the accumulation of information needed for scientific wildcatting.

The year 1953 saw the completion of many wildcat discoveries in the United States which further



FIG. 1.—ROBERT H. DOTT, executive director, A.A.P.G., Tulsa, Oklahoma; GRAHAM B. MOODY, vice-president-elect, A.A.P.G., San Francisco, California.

broadened and brightened exploratory thinking. Some of these discoveries were in the wide-open spaces, others hugged or were within areas of big production; some were completed as significant producers, others made only small wells but afforded a positive indication of an area's potentialities.

#### 7. EXPLORATION FRONTIERS IN WESTERN CANADA.

W. B. GALLUP, Royalite Oil Company, Limited, Calgary, Alberta.

This paper stresses problems concerning exploration in the western part of the Western Canada sedimentary basin, especially in the Alberta syncline and foothills belt. Some reference is made to certain problems elsewhere in the basin.

The area is seen as a true frontier both with respect to geography and geologic thinking. Problems of access and various exploration techniques peculiar to the wilderness areas are described. Geological thinking with respect to the syncline and foothills is changing rapidly and these approaches are also discussed.

#### 8. WILLISTON BASIN DEVELOPMENTS, 1951-1953.

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The phenomenal rate of development in the Williston basin can best be visualized by remembering that at the end of 1950 there was not one producing oil well within the basin parts of North Dakota, South Dakota, Montana, Saskatchewan, or Manitoba. During three years of unprecedented exploratory drilling which followed the first commercial production of oil in the Williston basin (Viriden field, T. 10 N., R. 28 WPM., Manitoba, Canada), 55 oil fields, 20 field extensions, and 4 gas fields have been discovered. During this period, production has been established from 16 different formations. One of the most spectacular discoveries during this period came in August, 1953, when