Part II, The Habitat of Some Oil

Recently, a detailed statistical study was made of 236 or all the free world's major oil fields (those with 100,000,000 barrels or more ultimate recovery). These fields account for 217 billion barrels or 82.5 per cent of the ultimate reserves discovered to date outside the Soviet orbit. According to the results obtained, the bulk of the oil occurs: (1) on the stable side of basins, (2) in anticlines, (3) in sandstone and carbonate reservoirs, (4) from formations of Mesozoic age or younger, (5) from a depth range of 2,000 to 8,000 feet.

Most of the discovered free world ultimate oil is 30° API gravity or lighter, with mixed asphaltic-base oils predominating. Both the number of fields and the volume of reserves have been cyclic with ten-year intervals starting in 1917.

9. GREGORY K. ELIAS, Gulf Oil Corporation, Durango
Tectonics of Paradox Basin and Its Relation to Oil Occurrence

The Paradox basin is defined as the areal extent of the Pennsylvanian evaporitic Paradox formation in the Four Corners area.

Two areas of uplift, the Fort Defiance and San Luis, influenced sedimentation throughout the entire Paleozoic. The Uncompahgre uplift developed during early Pennsylvanian time and remained active through the Permian.

Possible stratigraphic traps are postulated for the Devonian and Mississippian sediments in the proximity of the Fort Defiance and San Luis uplifts. Tectonism during the Pennsylvanian has given rise to potential reef production in beds bordering the evaporite basin. Stratigraphic porosity trends within the Paradox evaporite basin have yielded oil and gas. The major duty of the stratigrapher will be to determined the porosity belts. Sand pinch-outs may be expected in proximity to the uplifted areas in both Pennsylvanian and Permian sediments.

10. PHIL A. MUNDT, Mobil Producing Company, Billings
Paleotectonic Control of Carboniferous Sedimentation in Central Montana

In central Montana the accumulation of oil in the so-called "Heath" and "Amsden" formations is controlled by complex stratigraphic relationships. These relationships, however, are clarified by an analysis of the effect of tectonic elements upon depositional patterns. A revision of stratigraphic units is necessary in the process; such a revision is here proposed.

The "Amsden" formation of the central Montana area consists of three lithologic divisions—an upper light-colored cherty carbonate member, a middle brown ostracodal limestone unit, and a lower sequence of red shale and sandstone beds. The upper dolomite unit is lithologically, stratigraphically, and paleontologically equivalent to the carbonate portion of the Amsden formation at its type locality in northern Wyoming. The Amsden dolomite overlaps the underlying two units which pinch out southward and are not laterally continuous with Amsden beds in Wyoming.

The Amsden dolomite of Atokan age is unconformable with the underlying brown limestone unit which is probably of Chester age but may be very early Pennsylvanian, in part or altogether. This brown limestone was named the Alaska Bench formation by Freeman and his terminology is recommended for future use.

Since the "Heath" formation includes two lithologically distinct units which are separated by an unconformity, the term Heath is herein restricted to beds below the unconformity. The term Tyler is revived to apply to beds above the unconformity. The Tyler formation includes a lower sequence of dark gray shales and channel sands, a tongue of marine limestone, and an upper "red shale member." The channel sands in the lower part of the Tyler formation form excellent oil reservoirs at the prolific Northwest Sumatra and other central Montana fields.

The unconformity at the top of the restricted Heath formation is the result of tectonic instability at the end of Heath time; this instability is reflected in the depositional types of the Tyler formation. Paleogeologic maps illustrate that the "ancestral Sweetgrass arch" and its un-named counterpart on the south side of the Big Snowy trough were the principal effective tectonic elements. Where the Amsden dolomite onlaps the southern un-named element, excellent oil possibilities exist, and several oil fields have been discovered along the trend.

11. VINCENT C. KELLEY, University of New Mexico, Albuquerque
Tectonics of Colorado Plateau

The Colorado Plateau structural province consists of seven principal basins, nine principal uplifts, and several intermediate tectonic divisions such as platforms, slopes, sags, and broad saddles. Long monoclinal flexes between uplifts and basins are the principal lines of deformation in and marginal to the Plateau.

The Plateau may be divided roughly into northeastern and southwestern parts which differ considerably as to the magnitude and form of the principal tectonic elements. The northeastern part includes the major basins (Uinta, Piceance, and San Juan), the Paradox fold and fault belt, and up-