FOR EDITOR (1971–1973)

FRANK E. KOTTLOWSKI, Socorro, N.M.

Biographies of the candidates will be published in the December *Bulletin*. Ballots will be distributed to the active membership on or about January 15, 1971. The balloting will close on March 15; ballots postmarked thereafter will not be counted.

AAPG DISTINGUISHED LECTURE TOUR ABSTRACTS

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PETROLEUM POTENTIAL OF UNITED STATES

Important oil and gas fields continue to be found in unusual and surprising geologic environments. Each discovery improves the petroleum geologist's understanding of the habitat of oil, and sharpens his oil-finding ability. An adequate supply of domestic petroleum in the future depends on unique discoveries to a greater extent than in the past.

The existence of many more unusual accumulations and others at customary or greater depths in both the less explored and more thoroughly explored areas is not doubted by the authors of the Association's Memoir 15, "Future Petroleum Provinces of the United States." They have approached the problems of the country's petroleum potential positively, not negatively, and have expressed their opinions qualitatively and generally quantitatively. An enormous amount of old and new geologic and other exploratory data has been assembled which should provoke alternate opinions lending to additional discoveries.

The extent to which the vast proved reserves of petroleum resources are reduced depends on the impact of ever-changing economic and political events on the rising tide of technologic competence and knowledge. The role of the petroleum geologist as earth scientist, explorer, and salesman is destined to grow in importance, particularly onshore in the conterminous United States where a significant percentage of the visualized undiscovered crude oil and natural gas is in stratigraphic traps, combination stratigraphic and structural traps, reefs, and complex structural situations.

Clearly, a great deal more exploratory drilling is needed, not only to explore such traps, but to provide much needed geologic and production data for the large undrilled areas. To the extent industry and government policies militate against expanded exploration, particularly drilling, a large part of the petroleum resources will lie uselessly in the ground.

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GEOLOGY OF MIDDLE EAST

A coincidence of sedimentologic, stratigraphic, and structural conditions is the reason for the occurrence of more than 10 supergiant petroleum fields in the Arab countries bordering the Gulf of Arabia. Of the known petroleum reserves of the world, 60% are in the large asymmetric Mesozoic-Cenozoic basin northeast of the Arabian shield. Marine shale; siltstone; sandstone; limestone; evaporites, including salt, dolomite, gypsum, and anhydrite; and nonmarine strata make up a complex stratigraphic section ranging from Cambrian to Holocene. The large petroleum reserves are in Mesozoic and Cenozoic sandstone and limestone where traps may be controlled both by sedimentary facies and structure. A wide variety of faulting and folding have accompanied the formation of the basin and of special note are the great overthrusts with large-scale plastic deformation. Salt intrusions are abundant in the southern part of the Gulf of Arabia and in the southern Zagros Mountains.

The Gulf of Arabia is along the border and parallel with the edge of the Arabian shield where it abuts the Tethys fold belt. Plate-tectonic concepts suggest a squeezing together (compression) of the Arabian shield and the main mass of Asia. Possibly this particular structural, stratigraphic, and sedimentologic geologic model should be a guide to geologists seeking other future petroleum provinces.

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ANCIENT DELTA SYSTEMS OF GULF OF MEXICO BASIN

Thick, offlapping, terrigenous clastic wedges make up the principal fill of the Gulf basin. Proximal parts of these wedges consist of paralic deposits formed either as large-scale high-constructive delta systems (with related strike systems) or as a series of smaller high-destructive delta systems. Distal parts accumulated as continental slope deposits associated with salt-diapir fields at the terminus of prograded paralic systems.

High-constructive delta systems (*e.g.*, lower Wilcox, Yegua, and Jackson) are comparable in scale and facies to Holocene Mississippi deltas. They were supplied by rivers with large-volume sediment discharge; fluvial facies are concentrated locally along the basin margin. These deltas consist dominantly of fluvial and fluvially influenced deposits, with extensive coal-bearing delta-plain facies, thick progradational delta-front sand facies, and very thick, organic-rich prodelta mud facies. Progradational sand facies show either lobate or elongate patterns in plan. Delta systems of this type supported extensive strike-fed systems comparable to strandplain and barrier-bar systems of the Holocene northwestern Gulf Coast.

High-destructive delta systems (*e.g.*, upper Wilcox and Frio) are analogous to the Rhône and other Holocene deltas with significant marine modification (chiefly wave action) of fluvially introduced sediments. These deltas were supplied by numerous, relatively small rivers with moderately high sand load; updip fluvial facies persist along the entire basin margin. High-destructive deltas are composed of a series of sand bodies with thickness axes roughly parallel with regional strike. Each delta consists of local progradational sand facies (channel and channel-mouth bars) flanked marginally by extensive sand units reworked from channel-mouth bars. Associated prodelta mud facies is moderately thick to thin. High-destructive deltas supported local rather than an extensive strike-fed system.

Principal oil and gas reservoirs in high-constructive deltas occur in the progradational delta front sands with trends controlled by geometry and distribution of these lobate or elongate sand bodies. Vertical stacking of sand bodies is common, resulting in multipay fields. Trends within these delta systems are discontinuous along strike as facies between main prograded lobes consist mostly of mud and "tight" sand. Attendant growth faulting, salt doming, and mud intrusion cause structural traps. In related barrier-bar and strandplain systems trends are regionally persistent and stratigraphic traps are common. Oil and gas trends in high-destructive deltas are defined by local cuspate-trending