

MEETINGS

DOUBLE PRESENTATION—DECEMBER 10, 1986

URBAN S. ALLAN—Biographical Sketch



Urban S. Allan received a BS in Geology from LSU in 1955 and his Masters from Columbia University in 1956. In 1961, he joined Shell in Lafayette, Louisiana later moving to New Orleans and the Offshore Division in 1965. From 1970 to 1973, Mr. Allan worked in Calgary, Alberta with Shell Canada in the exploration of offshore Nova Scotia. Later assignments include Alaska Exploration, Head Office, Manager of various Rocky Mountain districts, Manager of Geology of the Rocky Mountain Division and presently Manager of Geology of the Pacific Frontier Division which includes Alaska.

MODEL FOR HYDROCARBON MIGRATION AND ENTRAPMENT

A model relates faulting to migration and entrapment. The basic assumption of the model is that a fault is neither a seal nor a conduit. Therefore, the effect of faulting on both migration and entrapment depends on the rock properties of strata juxtaposed by the fault and the structural attitude of the juxtaposed fault blocks. The fault plane section used with structure maps gives a three-dimensional view of migration and illustrates the interplay of three critical parameters: (1) closure style - unfaulted anticline, faulted anticline, or nose; (2) cross-fault geometry - the throw and change of throw along a fault; and (3) stratigraphic geometry - the thickness and spacing of permeable and impermeable units. Two types of spill points become apparent. Cross-fault spill points occur at loci of juxtaposed permeable units at the fault plane. Cross-fault spill points define limits of trapping potential for each permeable unit and paths for vertical migration. Synclinal spill points occur when a permeable unit encounters no cross-fault spill point within the limits of structural closure. Synclinal spill points define tops of vertical migration paths and egress points for lateral migration.

Any charge model can be integrated and tested with this model. Migration timing can be evaluated by doing the analysis in paleostructural modes. The validity and importance of exceptions to the basic model assumption can be clarified by comparison with model predictions.