EVENING MEETING—SEPTEMBER 10, 1984

ROBERT R. BERG—Biographical Sketch

Dr. Berg is Professor of Geology and holds the Michel T. Halbouty Chair at Texas A&M University. His academic experience was preceded by industrial experience totaling 16 years. From 1951 to 1956 he was employed as a geologist by the California Company (Standard Oil Company of California), from 1957 to 1959 by Cosden Petroleum Corporation, and from 1959 until 1966 he was a consulting geologist in the Rocky Mountain area. Industrial work was primarily exploration for oil and gas which included interpretations from subsurface data and geophysical surveys. In 1967 he became Professor and Head of the Department of Geology at Texas A&M University, and in July, 1972, he was named Director of the Office of University Research, a position he held for 10 years. Dr. Berg's studies have included petroleum geology, subsurface stratigraphy and sedimentology. Publications describe geophysical interpretations and origins of Rocky Mountain structures; studies of reservoir sandstones in California, Montana, Wyoming, Mississippi, West Texas, New Mexico, and in the Texas Gulf Coast; and the role of hydrostatic and hydrodynamic pressures in oil accumulation.

He received his B.A. and Ph.D. degrees in Geology from the University of Minnesota (1948, 1951). He has served as President of the Rocky Mountain Association of Geologists (1966) and as Secretary-Treasurer (1969) and President of the American Institute of Professional Geologists (1971). He is Fellow of the Geological Society of America, a member and Certified Petroleum Geologist of the American Association of Petroleum Geologists, and a Certified Professional Geologist (no. 35) of the American Institute of Professional Geologists. He has been a Distinguished Lecturer of the AAPG, has received the Association's A. I. Levorsen Memorial Award, and for the past 10 years has been a lecturer in the Continuing Education Program of the AAPG. He has also been a consultant for more than twenty corporations, both major companies and independents, for evaluation of sandstone reservoirs. In 1981 he was awarded the AIPG's Ben H. Parker Medal for "Outstanding Service to the Profession", and in September, 1982, he was appointed to the Michel T. Halbouty Chair in Geology at Texas A&M University.

ORIGINS OF ABNORMAL PRESSURES IN THE LOWER VICKSBURG, McALLEN RANCH FIELD, SOUTH TEXAS

The Vicksburg Formation consists of an upper member of shale about 2000 ft (610 m) thick and a lower member of interbedded sandstones and shales about 4000 ft (1220 m) thick. The entire section is abnormally pressured, and gradients range from 0.85 to 0.94 psi/ft (19.2 to 21.2 kPa/m). Pressures within the section were established by extrapolation of shut-in buildup pressures and by estimation of pressures from conductivity logs. Hydrostatic heads were then calculated and displayed in a vertical potentiometric profile. Head distributions suggest that hydrodynamic flow is taking place from areas of high pressure to an underlying major, listric normal fault and then updip along the fault plane. There is also upward flow from Jackson Shale below the fault. The top of abnormal pressures occurs at a depth of 7500 ft (2286 m) and at a temperature of about 210° F (99° C) where there is an abrupt decrease in smectite within the mixed-layer illite-smectite clays. Pressure increase with temperature does not follow isodensity lines for water as in the case of aquathermal pressuring. Therefore, it is concluded that abnormal pressures are largely the result of clay transformation below a depth of 7500 ft (2286 m), perhaps accompanied by pressuring due to hydrocarbon generation below 11,000 ft (3353 m).

A second zone of abnormal pressures with gradients to 0.74 psi/ft (16.7 kPa/m) occurs at about 6000 ft (1829 m) in the lower Frio Formation. In this zone, pressure increase with temperature follows isodensity lines for water, and it is concluded that aquathermal pressuring is the major casue of abnormal pressures. Shale densities suggest that nonequilibrium compaction may have played a minor role in creating abnormal pressures in the Frio.