LUNCHEON AND EVENING MEETINGS—FEBRUARY 29, 1984

THOMAS E. EWING—Biographical Sketch

Thomas E. Ewing is a Research Associate with the Texas Bureau of Economic Geology in Austin. He received his Bachelor of Science degree in Geology from Colorado College in 1975, his Master of Science degree in geochemistry at New Mexico Tech in 1977, and his Ph.D. in Geology at the University of British Columbia in 1981. He began work with the Bureau in October 1980.

Prior to moving to Texas, Dr. Ewing mapped a volcanic-filled basin in British Columbia, interpreted volcanic petrologic data, and engaged in regional mapping and tectonic interpretation. At the Bureau he has been working chiefly with the timing and evolution of Tertiary growth faults along the Texas Gulf Coast. He is also coordinator of a working group for the Tectonic Map of Texas.

Dr. Ewing is a member of the AAPG, the GSA, and the GAC (Canadian), and has served as secretary of the Austin Geological Society.

GROWTH FAULTS AND SALT TECTONICS IN THE HOUSTON DIAPIR PROVINCE—RELATIVE TIMING AND EXPLORATION SIGNIFICANCE

Oil and gas accumulation in Gulf Coast Tertiary strata is mainly controlled by regional growth faults and by salt-related structures. Salt forms the most prominent set of structures in the Houston diapir province of southeast Texas. Recent work in three study areas shows that the Tertiary growth-fault trends so well displayed along strike to the southwest continue through this salt basin as well, but have been deformed by later salt movement.

In the Katy area, seismic data disclose early (pre-Wilcox) salt pillows downdip of the Cretaceous reef trend. Progradation of the lower Wilcox Rockdale delta system created a linear growth-fault trend above and seaward of the pillows. Salt stocks were injected upward from the pillows in Claiborne time and were flanked by deep withdrawal basins and turtle structures. Major oil accumulations occur over an inferred turtle structure and over deep-seated salt domes. The lower Wilcox growth-fault trend deformed by the later salt flowage is virtually unexplored, although geopressured gas production from these low-permeability deltaic reservoirs exists in adjacent areas.

In Brazoria County, a major lower Frio growth-fault trend affecting the Houston delta system was deformed by later salt domes, by a salt-withdrawal basin, and by a possible turtle structure at Chocolate Bayou. A productive geopressured aquifer exists in the salt-withdrawal basin bounded by the previously formed growth faults. In Jefferson County, in contrast, salt tectonic activity and growth faulting appear to have been coeval. Early salt-cored ridges continued to rise throughout Frio deposition; growth faults occur both updip and downdip. Salt diapirism may have occurred throughout Frio time at Orange and Port Neches salt domes, but other domes such as Spindletop formed in post-Frio time. Hydrocarbons accumulated over the salt domes in growth-fault anticlines and in stratigraphic traps. Contemporaneous, low-intensity growth faulting and salt movement may be ascribed to the minimal loading imposed by the sand-poor lower and middle Frio section.

Recognition that shelf-margin growth faulting preceded the development of the present pattern of domes and basins has important implications for hydrocarbon exploration. Growth faults may be migration paths for hydrocarbons; futhermore, early-formed traps, distorted by salt movement, may still be found to contain hydrocarbons.