LUNCHEON MEETING—DECEMBER 10, 1984

JOHN W. SNEDDEN—Biographical Sketch

John W. Snedden is a Ph.D Candidate in geology at Louisiana State University, Baton Rouge, Louisiana. He received his bachelors degree from Trinity University, San Antonio, Texas in 1977. In 1979 he received his M.S. from Texas A&M University. His thesis delt with the paleoenvironment of lignites in the Jackson Group of South Texas. From 1979 to 1983 he was employed by Mobil Producing Texas and New Mexico, INc. (Houston, Texas) in its South Texas exploration and West Texas production groups. In 1983 he took educational leave to pursue research upon the dynamics of sediment transport on the South Texas continental shelf. John's presentation was named as a runner-up in Matson award competition at the 1984 AAPG National Convention in San Antonio. The text will apear in Volume 34 of the GCAGS Transactions.

VALIDITY OF THE USE OF THE SPONTANEOUS POTENTIAL CURVE SHAPE IN THE INTERPRETATION OF SANDSTONE DEPOSITIONAL ENVIRONMENTS

The spontaneous potential curve shape is frequently used in the interpretation of sandstone depositional environments. The "cylinder-", "funnel-", and "bell-shaped" SP profiles are among the most frequently employed. According to the advocates of this technique, the "cylinder" represents a clean sandstone, the "bell" a sandstone with a fining upward texture, and the "funnel" a sandstone which displays a coarsening upward texture. However, the validity of this commonplace practice has never been thoroughly established.

Theoretical and experimental work and actural field examples suggest that the vertical trend of the SP deflection does not display a direct relationship with the vertical trend of variables known to be controlled by the sandstone paleoenvironment. The vertical trend of quartz grain size shows a low linear correlation with the vertical trend of SP deflection. The vertical trend of clay content shows a higher correlation, but changes in clay type and cation exchange capacity can have more impact upon the SP than the simple volume of clay.

Field examples drawn from the Upper Cretaceous and Tertiary of the Gulf Coast show that hydrocarbons, local variations in the mud filtrate salinity, and regional differences in formation water salinity can greatly alter the SP curve shape. This can result in erroneous interpretations of sandstone origin.

Curve shapes derived from the microresistivity measurements of the dipmeter tool are suggested as an alternative to the SP curve shape. The greater sensitivity of the dipmeter tool, its immunity to the problems of hydrocarbons and Rmf/Rw contrasts, and the relationship of microresistivity to primary rock properties are factors favoring the use of microresistivity curve shapes for the interpretation of sandstone depositional environments from subsurface data.