MEETINGS

HGS DINNER MEETING—JANUARY 8, 1990

W. C. (RUSTY) RIESE—Biographical Sketch

Dr. Riese received his BS in geology from the New Mexico Institute of Mining and Technology in 1973, and both his MS and PhD in geology from the University of New Mexico in 1977 and 1980 respectively. His work experience includes both the mineral (Gulf Mineral Resources Co., 1974-1981, and Anaconda Minerals Co., 1981-84) and petroleum (ARCO Exploration Co., 1984-to date) industries. He is the author of numerous articles on minerals geochemistry and seismic stratigraphy.

WILLIAM A. HILL—Biographical Sketch

William A. Hill received his Bachelor of Arts degree from La Salle University (Philadelphia, Pennsylvania) in 1979. He completed his Master of Science in Geology at Texas Christian University (Fort Worth, Texas) in 1981.

Mr. Hill is employed by ARCO Oil and Gas Company, Southern District, Houston Texas (1981-current). He has worked as a geologist in exploration and development activities in Offshore Texas and Louisiana. This work has lead him to author and co-author articles on Gulf Coast geology.

RASHEL N. ROSEN—Biographical Sketch

Rashel N. Rosen holds a BS degree from the University of Tehran, a MS degree from Ohio State University and a PhD degree from Louisiana State University. Rashel has worked as biostratigrapher in the Gulf Coast area, onshore and offshore, and has extensive experience in the Middle East, Africa, South America, Java and China. She has 22 years of industry experience including working with the Geological Survey of Iran, Texaco Inc. in New Orleans, Deminex German Oil Company in Dusseldorf and the Middle East, Robertson Research U.S., and since 1983 working with ARCO Oil and Gas Company in Houston as District Stratigrapher/Exploration Advisor. She has extensive experience in developing stratigraphic frameworks, establishing facies relationships, and correlating sections on both a regional and local scale.

SEISMIC-STRATIGRAPHIC ANALYSIS OF THE MIOCENE SYSTEM, OFFSHORE TEXAS - MODELS AND IMPLICATIONS

The application of traditional seismic-stratigraphic models to the Miocene System of offshore Texas was tested and found to be inadequate for the description of this section. Although the basic principles inherent in the application of seismic stratigraphy are useful, there are significant deviations from the model geometries of system tracts in the Miocene System. The most significant of these discrepancies is the apparent absence of lowstand wedges and shelf margin wedges.

Problems with applying the traditional seismic stratigraphic models to the interpretation of this section have been recognized by others, and alternative ramp and growth models have been suggested. These, too, appear to be inadequate for interpretation of this section: the ramp model fails to account adequately for outer neritic bathymetries in apparent outershelf settings during lowstands; the growth fault model fails to adequately explain downthrown expansion of predominantly shale intervals.

The alternatives proposed here postulate a fundamental difference in global, or at least basinal, water budgets for Miocene time relative to the Pleistocene or Recent: eustatic levels in the Gulf of Mexico during the Miocene were apparently several hundred feet higher than during the Pleistocene and therefore erosion of the shelf during lowstands was minimal. It may also be inferred that surface gradients on the Texas shelf were steep during the Miocene and there was no pronounced continental shelf-slope break; without such a break there is no steep surface against which to onlap the updip reaches of shelf margin wedges or low stand wedges, thus accounting for the absence of these geometries in our seismic data. This accounts for the presence of depositional fans in outer neritic, apparently shelfal settings during lowstands.

Expansion of shale-prone section downthrown to growth faults is accounted for by noting the proximity of what must have been a broad zone of structural foundering on the "outer shelf" to cold, nutrient-rich, deep-basin waters. As sea levels rose during highstands of sea level to further transgress an already submerged shelf, upper bathyal ecozones were brought onto the "shelf", expanding the geographic limits of cold water organisms. More critically, this brought nutrient-rich waters to a broader reach of photic-zone organisms. It is the proliferation of these organisms that accounts for the expansion of shale-prone intervals along growth faults: these sections are enriched in fossil content.