MEETING

HGS DINNER MEETING—
DECEMBER 9, 1991
Social Period, 5:30 p.m.,
Dinner and Meeting, 6:30 p.m.
Post Oak Doubletree Inn

MARK L. BUTLER—Biographical Sketch

Mark L. Butler is presently a Research Associate with Amoco Production Research in Tulsa, Oklahoma. He is assigned to the Sequence Stratigraphic Research Group and is currently studying sequence stratigraphic and clastic depositional problems in the North Sea. The primary goal of these studies is the development of enhanced lithology prediction methodologies.

Prior to Mr. Butler's transfer to Amoco Production Research in 1989, he worked for several years in Amoco's Denver exploration office as a Sr. Staff Geologist with the California Exploration Group. Since 1977, he has been with several companies in the petroleum industy: UNOCAL as an Exploration Geologist, Hamilton Brothers Oil Co. as a Senior Geologist and Lear Petroleum as a Division Geologist. He received his B.S. (1975) and M.S. (1977) in geology from Ohio University.

The following two abstracts focus on different aspects of a single project. These papers were originally presented by Mark L. Butler and Greg A. Self at the 1991 AAPG Annual Convention in Dallas. For the purposes of this HGS meeting the two papers have been consolidated into a single presentation, and will be presented by Mark L. Butler.

PRECISION SEQUENCE STRATIGRAPHY OF THE PLIO-PLEISTOCENE, GULF OF MEXICO: DIGITAL INTEGRATION OF SEISMIC, LOG, PALEONTOLOGIC, AND OXYGEN ISOTOPE DATA

by G. A. Self, M. L. Butler, and R. W. Scott

An empirically based, versus a model-driven, methodology was developed based on digital integration of seismic data with lithologic, paleontologic, and oxygen isotope data within a computer workstation environment. This flexibility allows the interpreter to visualize the full dynamic range of the seismic data and to manipulate both the temporal and spatial domains.

Seven depositional sequences were defined within the Plio-Pleistocene clastic section of the northern Gulf of Mexico basin, offshore Louisiana. Six of these seven sequences are associated with major falls in sea level that occurred at about 200ka, 500ka, 900ka, 1.5Ma, 2.0Ma, 2.7Ma, 3.0Ma and 4.5Ma. Graphic correlation of oxygen isotope stages and foraminiferal climatic assemblages demonstrates that these sequence boundaries developed during third-order cool climatic stages and low sea level.

The most sand-rich section was deposited during a significant climatic warm period that developed during the middle Pliocene, prior to the onset of glaciation of the North American continent. During this period, a large delta system prograded across the shelf and deposited significant amounts of sand onto the slope. This occurred in spite of an estimated 35m sea level rise, above present day.

Significant deposition of potential reservoir sands in the slope environment occurs during every subsequent phase of sea level fluctuation, the result of the interaction between sea level fluctuation, climatic variations, sedimentary processes, salt tectonics and basin geometry. The combination of these factors cause wide variation in the timing of, as well as the process by which sediments are shed into the slope environment.