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CLYDE H. MOORE—Biographical Sketch

Clyde H. Moore is presently Director of the newly formed Basin Research Institute and Professor, Department of Geology, L.S.U., Baton Rouge, LA. He has been with LSU since January 1966 as an Assistant, Associate and Full Professor. During his tenure at LSU. Dr. Moore has been a consultant to a number of major oil companies, has been active in the continuing education program of the AAPG and was named an AAPG Distinguised Lecturer in 1978. Before joining LSU, Dr. Moore was a Research Geologist with Shell Development Co. in Austin, San Angelo, Houston and Ventura, California. He received his PhD and MS degrees from the University of Texas at Austin and his BS from LSU. His research interests are carbonate petrology, geochemistry, burial diagenesis, sedimentology, and stratigraphy. He has been actively engaged in research in the Mesozoic of the Gulf Coast, St. Croix, Grand Cayman, Jamaica and the Bahamas in the Caribbean, and Eniwetok in the central Pacific.

REGIONAL JURASSIC SMACKOVER DOLOMITIZATION: IMPORTANCE, ORIGIN AND CONTROLS

One of the most important reservoir types in the Jurassic Smackover consists of oomoldic dolomite. These dolomite reservoirs can exhibit excellent commercial porosity and permeability while their limestone counterparts are consistently tight. Dolomitization of upper Smackover lime grainstones occurred in three major episodes: an early episode associated with oomoldic porosity development, a long-term subsurface event associated with progressive pressure solution, and a dolomite cementation event associated with subsurface brines. The early dolomitization event tied to oomoldic porosity is regional in distribution and is the major economic porosity type in the Smackover of East Texas, Alabama and Florida. The later subsurface dolomites act to occlude, rather than enhance, porosity and permeability in the upper Smackover.

The distribution of early Smackover oomoldic dolomites seems to be tied to the occurrence of massive evaporites in the Haynesville Buckner member directly overlying the Smackover. Progressive increases in the percentage of early dolomite occurring in the upper Smackover adjacent to the overlying Buckner evaporites further tie Smackover dolomitization to these Buckner evaporites. In detail, patterns of early dolomitization are controlled by primary porosity (distribution of grainstones) in the Smackover.

The model for early Smackover dolomitization consists of the following elements:

1. Development of a fresh meteoric water system in the updip areas of the upper Smackover giving rise to oomoldic porosity, and partial calcite cementation.
2. Development of a rimmed carbonate shelf margin during a rising sea level at the beginning of the Kimmeridgian, forming an evaporite lagoon overlying the Smackover platform.
3. Reflux of heavy evaporite brines (with high Mg/Ca) into porous upper Smackover ooid grainstones below, mixing with the Smackover regional meteoric water system, triggering a mixing dolomitization event.

This model is consistent with regional facies patterns and sedimentation history of the units involved, geochemistry of the dolomite and the observed burial history of the Smackover. The Buckner lagoon mixing model should be a valuable predictive exploration tool for those seeking favorable upper Smackover reservoir trends.