Wednesday, March 19, 2003

Anadarko Petroleum, 1201 Lake Robbins Drive, The Woodlands, TX
From I-45N, exit Woodlands Parkway (exit 76-b), turn right onto Woodloch, then right onto Lake Robbins Drive.
Social 11:15 a.m., Lunch 11:45 a.m.

Cost: $25 Preregistered members; $30 Nonmembers & Walk-ups

Make your reservations now by calling 713-463-9476 or by e-mail to Joan@hgs.org (include your name, meeting you are attending, phone number, and membership ID#).

HGS Special
Luncheon Meeting in The Woodlands

by ***Robert K. Goldhammer***
Assistant Professor of Geology
The University of Texas at Austin

The Influence of Syndepositional Salt Tectonics on Carbonate Platform Development and Stratal Architecture:

Examples of (1) coeval diapiric uplift (Paleocene La Popa platform, northeast Mexico) and (2) gravitationally-driven extension and rafting (Aptian-Albian carbonates of the south Atlantic Basins, Upper Jurassic of the GOM)

One of the most underestimated factors influencing carbonate platform development and its internal architecture is the role of syndepositional tectonics, either in the form of high-frequency, regional tectonic "flexing", for example, tectonic reversals within strike-slip settings, or local uplift/subsidence related to underlying movement of mobile lithologies such as evaporites or shale. In many, if not all, passive margin settings, thick layers of evaporite (principally halite or "salt") accumulate above the regional break-up unconformity above the syn-rift section, such as the divergent Mesozoic margins of the Gulf of Mexico, west Africa (Angola/Congo) and South America (Brazilian margin).

In many passive margin settings, thick layers of evaporite accumulate above the regional break-up unconformity above the syn-rift section, and widespread carbonates overlie these evaporites.

In all of these Mesozoic divergent margin examples (and many Paleozoic examples as well), widespread carbonates overlie these evaporites, for example: (1) the Upper Jurassic Smackover/Buckner/Haynesville ramp carbonate complex of the US Gulf of Mexico rests upon mobile Middle Jurassic Louann salt; (2) the Albian carbonate systems of both west Africa (Congo and Kwanza Basins offshore Angola) and Brazil (Santos and Campos Basins) overlie thick Lower Aptian salt associated with the breakup of Pangaea.

Inspection of offshore seismic data is replete with numerous examples of syn-depositional salt tectonism that was active during the development of the carbonate ramp and rimmed shelf systems. Typically, two modes of salt-influenced activity occur:

(1) Pillowing and diapiric uplift of mobile salt can create topographic highs that are favorable sites for carbonate accumulation (high-energy grainstones and reefs; e.g., the Holocene of the Persian Gulf);

(2) Gravitationally driven extension and downdip lateral migration of incipient thin carbonate deposits that occur over the mobile salt unit in the form of "raft tectonics."

In both scenarios, carbonate sedimentation is active while the local substrate is affected by salt-induced uplift, enhanced subsidence, and/or lateral sliding. The common occurrence of such phenomena in many Mesozoic divergent margins indicates that the role of syndepositional salt tectonics is very much a factor controlling the evolution of carbonate systems, something that is almost universally excluded in summaries of carbonate depositional models and stratigraphic evolution. ■

Biographical Sketch

ROBERT K. GOLDHAMMER received a PhD from The Johns Hopkins University in 1987. He is currently professor of geology at the University of Texas at Austin, where he instructs undergraduate and graduate level classes that focus on the origin and evolution of carbonate rocks and associated evaporite and siliciclastic ➢

continued on page 21

HGS Special Luncheon continued from page 19

deposits. His current research emphasizes field-oriented carbonate sequence stratigraphy and sedimentology integrating quantitative stratigraphic techniques and regional basin analysis with tectonics and structural geology to address large-scale regional problems. His research has incorporated large subsurface data sets (well-logs, cores and seismic data) to tackle problems in areas of active hydrocarbon exploration and production, such as offshore Angola (West Africa). Past research efforts have focused on the integration of all aspects of carbonate and mixed siliciclastic-carbonate stratigraphy. His interests include the cataloguing of carbonate platform evolution throughout geologic time in the context of different tectonic settings (convergent vs. divergent margins) and different climatic regimes (icehouse vs. greenhouse periods).

Goldhammer served as an associate editor for the *Journal of Sedimentary Research* (1992–1996) and has chaired several oral and poster sessions at society meetings (AAPG, SEPM). He has led over a dozen field trips for geologic conventions (AAPG, SEPM, GCAGS, HGS) to areas such as northeast Mexico, northern Italy, West Texas, and southeast Utah.