# MEETINGS

## HGS DINNER MEETING— OCTOBER 9, 1989

### JOHN VAN WAGONER—Biographical Sketch

John Van Wagoner received his Bachelor of Arts degree from Wooster College in Wooster, Ohio, in 1972, and his Master of Science and Doctoral degrees from Rice University, Houston, Texas between 1973 and 1976.

Dr. Van Wagoner is employed by Exxon Production Research Company where he conducts research in siliciclastic facies and sequence stratigraphy.

### HIGH-RESOLUTION SEQUENCE STRATIGRAPHY USING WELL LOGS AND CORES

Sequence stratigraphy is the study of sedimentary rocks within a framework of genetically related facies bounded by chronostratigraphically significant surfaces. Using the concepts of sequence stratigraphy, it is possible to construct a high-resolution chronostratigraphic framework from well logs, cores, and outcrops for the analysis of reservoir, source, and sealing rocks at a reservoir to regional scale.

The sequence is the fundamental stratal unit for a sequence stratigraphic analysis. Sequence boundaries are areally continuous surfaces within a basin, interpreted to form as a result of a eustatic fall (Vail et al, 1977). The sequence boundary is overlain and underlain by rocks of different ages; but all of the rocks above the boundary are younger than all the rocks below the boundary, so the boundary has time-stratigraphic significance.

There is a distinct break in deposition and a basinward shift in facies across the unconformable portion of a type-1 sequence boundary, making it a natural surface for separating facies above and below. Recognition of sequence boundaries on well-log cross sections is essential for accurate lateral and vertical facies analysis leading to reservoir mapping and distribution prediction.

Parasequences are the building blocks of the sequence. Aggradational, progradational, and retrogradational stacking patterns of parasequences are used to subdivide the sequence into systems tracts. Parasequence boundaries are locally continuous surfaces interpreted to form as a result of a relative rise in sea-level, and are ultra high-resolution chronostratigraphic surfaces used to correlate time and facies from well logs within a sequence framework.

Integration of sequence and parasequence correlation concepts provides techniques to look at basins in fresh ways resulting in: 1) definition of new play types, opening up heavily drilled basins for new exploration, 2) improved ability to define and locate subtle, but potentially profitable stratigraphic traps, and 3) a more integrated stratigraphic framework for risking new plays.