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HOUSTON GEOLOGICAL SOCIETY
JOINT MEETING
GEOPHYSICAL SOCIETY HOUSTON

- Speaker:** Dr. Peter R. Vail
Exxon Production Research Co.
Houston, Texas
- Title:** "Eustatic Cycles from
Seismic Data for Global
Stratigraphic Analysis"
- Place:** Hyatt Regency Hotel
Imperial II Ballroom
- Time:** Wednesday, October 29, 1975
Cocktails: 11:30-12:00, \$1.30
Luncheon: 12:00, \$5.50
- Parking:** Parking is available in Regency
Southwest Garage, with entrances on
Louisiana and Clay. Use 3rd floor
skywalk to 2nd floor of hotel.

I will attend and will have _____ guests.

Signed _____

Must be posted by Friday, October 24, 1975. Final
reservations due to Hyatt by Monday noon,
October 27, 1975.

For late reservations or
cancellations call 223-9309.

DR. PETER R. VAIL

Since 1965, Dr. Peter R. Vail has been at the Exxon Production Research Laboratories in Houston. He is research advisor and supervisor of seismic interpretations, global tectonics, structure, geochemistry applications and computer applications. For nine years before that he was at the Jersey Production Research Laboratories in Tulsa, Oklahoma.



Dr. Vail received his AB degree from Dartmouth College in 1952 and his M.S. and Ph.D. from Northwestern University, finishing in 1956.

He is currently an AAPG Distinguished Lecturer and the paper that he is presenting is the one that he is giving on the lecture tour.

EUSTATIC CYCLES FROM SEISMIC DATA FOR
GLOBAL STRATIGRAPHIC ANALYSIS*

Eustatic cycles are evident throughout Phanerozoic time because many relative changes of sea level determined from the stratigraphic record of different continents are simultaneous, and because the magnitudes of the relative changes generally are similar. These regional cycles are determined from sequences with coastal onlap, seen best on seismic sections with age and environmental control.

Coastal onlap is the progressive landward onlap of littoral and/or nonmarine coastal deposits. Coastal onlap indicates a relative rise of sea level; a seaward shift of coastal onlap for the next sequence indicates a relative fall. Sea level changes can be measured using either the vertical or horizontal components of coastal onlap (coastal aggradation or encroachment) provided that adjustments are made for divergence and/or slope-angle.

A *eustatic cycle* is defined as a relative rise, stillstand, and fall of sea level on a global scale. Single cycles are asymmetrical with a gradual rise to stillstand and an abrupt fall, but the causes for such asymmetry are not fully understood. Eustatic cycles are grouped into thirteen eustatic supercycles showing the same asymmetry, but on a larger scale. Megasequences (*stratigraphic* units corresponding to supercycles) correspond approximately to the original "sequences" of Sloss.

Ages and durations of eustatic cycles are essentially documented. Although their amplitudes are still being determined, examples from nearly all continents have been analyzed. The eustatic cycle "clock" is an excellent worldwide time scale for dating significant events in geological history.

*Co-authored by R. M. Mitchell, Jr., J. D. Sangree, and S. Thompson, III.