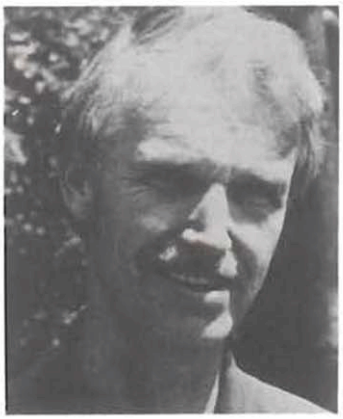
LUNCHEON MEETING—DECEMBER 14, 1978

JOHN S. SCHLEE—Biographical Sketch



John S. Schlee was born on September 27, 1928. He received his B. S. from the University of Michigan in 1950, and his Masters from U.C.L.A. in 1953. In 1956 he received his Ph. D. from Johns Hopkins University. Dr. Schlee spent two years mapping uranium deposits near Laguna, New Mexico for the U.S.G.S. In 1958 he joined the faculty of the University of Georgia as an Assistant Professor. After four years in academia Dr. Schlee returned to the U. S. Geological Survey, serving as a Research Geologist at the Office of Marine Geology at Woods Hole, Massachusetts. He has devoted the greater part of his time to the study of the geology of the oceans, with special emphasis on the geology of continental shelves of the U.S.

STRUCTURE, STRATIGRAPHY AND DEVELOPMENT OF THE WESTERN NORTH ATLANTIC CONTINENTAL MARGIN (Abstract)

Analysis of more than 15,000 km of contract multichannel seismic profiles taken across the U.S. Atlantic continental margin shows that it has undergone a rifting phase (during the separation of North America and Africa) and a broad subsidence phase during the past 185 m.y. As a result, sedimentary basins containing as much as 14 km of sediment have formed adjacent to block-faulted platforms. Maximum subsidence was during the rifting and early subsidence phases (Late Triassic and Jurassic) when as much as 4 to 8 km of presumed nonmarine and marine sediments accumulated in the basins.

The main structural elements are basins and platforms. The basins are broad seaward-thickening features as much as several hundred kilometers long and 150 to 400 km wide (Georges Bank basin, Baltimore Canyon Trough, Blake Plateau Trough). Studies of magnetic and gravity data indicate that seaward edges of the basins may be bordered by thickened zones of oceanic crust, over which carbonate deposits as young as Early Cretaceous have accreted. The central parts of the basins appear to be built over a zone of rifted continental or transitional crust. Adjacent to the basins are block-platforms (La Have, Long Island, Carolina) where a thinned wedge of Mesozoic and Cenozoic rocks has been deposited. Seaward of the platforms, the sedimentary section thickens to several kilometers within narrow troughs. A discontinuous reef-platform complex formed the ancestral continental slope just as it formed adjacent to basins, although places the shelf break was formed by a balance of clastic sedimentation, erosion, and subsidence.

Studies of the acoustic stratigraphy show that the sedimentary section can be divided into as many as eight units using the reflectors to outline major bounding unconformities. Analysis of reflector characteristics and interval velocities for each unit indicates that the earliest stages of basin development (Late Triassic and Early Jurassic) were marked by the deposition of as much as 8 km of nonmarine sediment and evaporite deposits. During the remainder of the Jurassic, as much as 4 km of nonmarine clastic sediments was deposited in the landward parts of the basins, and marine carbonate and evaporite deposits accumulated in the seaward part. In the Cretaceous, the pattern changed to dominantly marine and non marine clastic sediments off the northeastern United States as the shelf was prograded over the older reef-platform complex to build a gentle slope into the basin. Carbonate sedimentation continued during the Late Cretaceous off the southeastern United States, but scour by the ancestral Gulf Stream shifted the main area of slope development 300 km to the west.

Continued subsidence, coupled with termination of the reef complex and diminished sedimentation during the Late Cretaceous and Cenozoic, has created a broad deep-water plateau (Blake Plateau) in the south. During the same interval off the northeastern United States, deposition was mainly on the shelf *or* the continental rise, as the slope was eroded back intermittently 10 to 30 km.

Structures of potential economic interest beneath the shelf are drape structures over irregular basement blocks or over an intrusive plug, buried reefs, and diapirs. Future interest in deep-water areas may center on the seaward flank of the Cretaceous and Jurassic reef-platform complex where deeply buried anoxic shales rich in organic material may interfinger with flank debris from the platform, beneath the continental slope.