

## LUNCHEON MEETING—MARCH 30, 1988

### PHILIP LOWRY—Biographical Sketch



Philip Lowry is a geologist with Shell Offshore Inc. in New Orleans, Louisiana. He was born and educated in Belfast, Northern Ireland, receiving his B.Sc. (Hons.) and M.Phil. degrees from the University of Ulster, Coleraine, Northern Ireland in 1978 and 1982 respectively. The subject of his Masters thesis was the recent stratigraphy and numerical modelling of a barrier island system on the north coast of Ireland.

In 1980 he enrolled at Florida State University in Tallahassee to begin a Ph.D. in geology which was to focus on modern coastal depositional systems. In 1982 he transferred to Louisiana State University in Baton Rouge to work on a Ph.D. which would encompass both modern and ancient depositional systems. The subject of his dissertation concerned the regional stratigraphy and numerical modelling of stratigraphic sequences in the Wilcox Group in central Louisiana. While at LSU he taught historical geology and worked on projects on the Mississippi River delta and the continental shelf of the Alaskan Beaufort Sea. He served as a summer intern with Mobil Oil, working on a regional evaluation of the Paluxy in Louisiana.

In 1987 upon completion of his graduate studies he began work for Shell Offshore Inc. and is involved in the exploration for Neogene 'deep water' reservoirs in the Gulf of Mexico.

### STRATIGRAPHIC FRAMEWORK AND DEPOSITIONAL FACIES OF AN ANCIENT SHELF MARGIN COMPLEX, DEEP WILCOX TREND, SOUTH-CENTRAL LOUISIANA

The subsurface component of the Wilcox Group (Paleocene-Eocene) within Louisiana exhibits two well-defined trends of oil and gas production. One trend is located in the 'shallow' subsurface (900 to 1800 m: 2953 to 5905 ft) which is in the area that has been the subject of the majority of previous Wilcox studies. The second production trend is located downdip from the shallow trend and is coincident with the approximate location of early Cretaceous and early Tertiary shelf-margins. The section of the Wilcox which corresponds with the location of this downdip trend is an example of an early Tertiary shelf-margin.

Up to seven stratigraphic sequences can be recognized in the Wilcox shelf-margin trend. These sequences are bounded by regionally extensive shale horizons. The vertical succession of sequences reflects an apparent balance between basin subsidence and deposition throughout the period of Wilcox deposition. Basinward migration of the shelf-margin during Wilcox deposition therefore was relatively minor.

The Wilcox shelf-margin exhibits three regions of structural stability. Two of the regions are located in western and eastern central Louisiana and exhibit relatively stable shelf-margins as manifested by the minimal occurrence of syndepositional-faulting (growth-faulting). Between these two stable regions, the shelf-margin is structurally unstable due to the preponderance of large-scale growth-faults. The stable shelf-margin regions occur where Wilcox sediments did not prograde significantly beyond the previous maximum advance (Tuscaloosa shelf-margin).

A thick ubiquitous shale interval (the Big Shale) which was believed by previous workers to represent the occurrence of a major marine transgression midway through Wilcox deposition is not readily apparent on regional well-log cross-sections. However, localized thickening of this interval is apparent within the Wilcox shelf-margin. The discordant relationship with underlying strata and a channelized form suggests that a period of extensive downcutting occurred during the middle Wilcox. The channel is almost 24 km (15 mi) wide and up to 300 m (984 ft) thick and is interpreted to have formed close to the shelf-margin by fluvial downcutting during a sea-level low-stand. New, deep (4,600-6,000 m: 15,000 - 20,000 ft) hydrocarbon exploration targets potentially exist in the low-stand system tracts associated with the formation of this channel.