EVENING MEETING—MARCH 12, 1979

DORIS M. CURTIS—Biographical Sketch

Doris Curtis was born and brought up in Brooklyn, New York and obtained her education at Brooklyn College and Columbia University, where she completed work on a Ph.D. in Geology in 1949. She has worked for Shell more than 25 years, but took time out for teaching at the University of Houston and the University of Oklahoma, and for research at the Scripps Institution of Oceanography. Most of her work has been in Gulf Coast geology. In recent years, however, she has become involved in "sourcery" and has been learning to speak geochemistry. This paper, which will be her SEPM Presidential address at the coming AAPG-SEPM Convention on April 2, is an attempt to marry the Gulf Coast Tertiary geology with geochemistry.

SOURCE OF THE OILS IN THE GULF COAST TERTIARY: WHY LOOK A GIFT HORSE IN THE MOUTH (Abstract)

Our understanding of the system in which oil is trapped in Gulf Coast Tertiary reservoirs is quite elegant: there is an orderly, systematic, predictable relation of environment of deposition, stratigraphy, structure, and hydrocarbon accumulation. The one essential element in the source-reservoir-trap-seal system for which we do not yet have definitive data is source. To predict distribution and volumes of undiscovered reserves and to use the Gulf Coast Tertiary basin as an analogue for prediction in similar geologic settings elsewhere, we would like to have a realistic understanding of the source element of the system.

Oils in Gulf Coast Tertiary reservoirs have a wide range of chemical and physical characteristics, some of which are related to the characteristics of the source rocks from which they originated. Using both geological and geochemical criteria, workers have identified possible source rocks in a variety of Cretaceous and Tertiary shallow- to deep-water settings.

To generate hydrocarbons, a source rock must have sufficient organic richness and sufficient maturity. Paleogeographic settings for depositional environments where anoxic conditions could have caused accumulated organic matter to be preserved are widespread along the Gulf margin in the Cretaceous and can be postulated at least locally in several parts of the Tertiary. Minimum richness values needed to generate hydrocarbons are still a matter of dispute.

The level of maturity of possible source rocks has been assessed by a wide range of criteria. With the generally low geothermal gradients in the Gulf Coast sediments, relatively deep burial is indicated. However, in the absence of agreement on criteria, general agreement regarding the identification of mature source rocks is lacking.

The question of possible source(s) for oils in Gulf Coast Tertiary reservoirs is related to the question of early vs. late migration. What was the time relation between generation, migration, reservoir deposition, and trapping? Combinations of inferences, interpretations, and facts suggest several possible scenarios consistent with the geology and the geochemistry, indicating that the oils were probably derived from more than one source. The integration of geochemistry with geology is leading us to a better understanding of the entire system, and is showing us the value of looking this gift horse in the mouth.