

## NOON MEETING—NOVEMBER 29, 1978

### PAUL J. CERNOCK—Biographical Sketch



Dr. Paul J. Cernock received his B.A. in Geology from De Pauw University, Greencastle, Indiana in 1964. His "roots" in Texas began after receiving his M.S. and Ph.D. in Geological Oceanography from Texas A&M University in 1967 and 1970, respectively. Dr. Cernock began his working career with Texaco Inc. in New Orleans, Louisiana and has held various assignments in development and exploration

geology in Texaco's Offshore and Onshore Divisions. His interest in organic geochemistry was stimulated by a quest for the identification of the source of oil trapped in shallow Pleistocene reservoirs in offshore Louisiana. Dr. Cernock left Texaco in 1974 to join GeoChem Laboratories, Inc., where he is currently Vice President and Chief Geologist in charge of operations and services in the Eastern Region, U.S.A. He is also co-founder and President of an affiliated company, Reservoirs, Inc., which completes the marriage between reservoir and source rocks.

Dr. Cernock's primary interest has been in source rocks of petroleum, crude oil characterization and crude oil/source rock correlation. He has written numerous proprietary well reports, and initiated and coordinated regional studies in the Southeastern States, Permian Basin, Georgia and Apalachicola Embayment areas. He is a member of AGU, HGS and NOGS.

### CRITICAL REVIEW: MATURATION CRITERIA UTILIZED IN THE EVALUATION OF SOURCE ROCKS (Abstract)

The interrelationships between petroleum and source rocks can be understood only if the important geochemical and geological data of both systems are known and correctly interpreted. In evaluating suspected source rocks, the geochemist has primarily focused attention on the organic richness (quality), organic matter type (gas, condensate or oil prone) and state of thermal maturity of the organic matter within these rocks. Various geochemical techniques have been proposed and accepted over the years to define organic richness, matter type and maturity. However, there have been questions and apparent contradictions in the industry primarily with establishing the thermal maturity of various source rocks. The geochemical data have been, in most cases, correct; unfortunately, the available geological data have often not been properly utilized to construct a valid geochemical/geological interpretation.

A critical review will be presented of various maturation criteria which are generally utilized in source rock evaluation studies, and the pitfalls which can trap the unwary if the geological data are not properly incorporated into the final maturity interpretation. Maturity may be defined by the color of dispersed organic matter (kerogen) viewed in transmitted light and/or by the vitrinite reflectance technique, which compares the reflectivity of the maceral vitrinite with a scale

based on coal rank. Any change in the level of maturation caused by an increase in geothermal history (time-temperature) results in a corresponding change in color of the dispersed kerogen and by changes in reflectivity ( $R_o$ ) of polished faces of the vitrinite materials.

This review will show that identical samples of rock can produce "kerogen" and "vitrinite" data which can be (mis)interpreted several ways, because the corresponding geological data have not been properly utilized.