NOON MEETING MAY 25, 1977

ARTHUR GREEN—Biographical Sketch

Arthur R. Green was born in California but moved to Tacoma, Washington at an early age. He majored in mining geology at Washington State University where he received a B.S. degree in 1957. After graduation, he was commissioned in the Air Force and upon completion of flight school he served three years as a bomb group navigator in the Strategic Air Command at numerous arctic stations. He then studied geology at the University of Oregon where he earned a Masters degree in 1962. He joined Exxon U.S.A. as an exploration geologist in Houston, Texas the same year. Assignments with Exxon U.S.A. included oil and gas exploration in Mesozoic and Cenozoic trends of the Gulf Coast, salt dome sulfur exploration, marine geology, and a period of production geology in Beaumont and Tomball, Texas. He joined Exxon Production Research Company in 1969 where he has conducted numerous on-site regional studies which have collectively covered much of the earth's surface. His research has been oriented toward a better understanding of the complex interaction of stratigraphy and tectonics in sedimentary basin development. Mr. Green is a member of AAPG, AGU, and Sigma Xi.

THE EVOLUTION OF THE EARTH'S CRUST AND SEDIMENTARY BASIN DEVELOPMENT (Abstract)

By: Arthur R. Green

The earth's crust is a thin, dynamic shell that changes in both thickness and composition through time. It is postulated that the changes that alter the crust are primarily the result of subcrustal processes and lateral interactions of crustal plates. The type of crust that underlies a sedimentary basin determines the physical framework, stability, manner of structuring, and conditions of sedimentation and environment throughout the evolution of the basin. Thus, as sediments are deposited, they record the tectonic history of the basin. These stratigraphic data can be used to develop conceptual, genetic models that put the evolution of oceanic, continental, and transitional types of crust into perspective. An orderly cycle of crustal evolution is proposed which suggests that oceanic crust is thickened and continental crust is thickened and thinned by a number of natural processes. The resulting transitional crustal types, which represent intermediate steps in the continuum, occupy a realm between thin, basic oceanic crust and thick, acidic continental crust. These transitional, somewhat unstable crustal types host most of the world's sedimentary basins. An attempt is made to step back from the detail of the complex interplay involved in the process of crustal genesis and sedimentary basin development and look at the overall natural system. A set of hypothetical, genetic models depicting the proposed origin of various crustal types is presented so that geophysical data can be compared and tested against them.