NOON MEETING—MAY 24, 1978

RICHARD D. McIVER—Biographical Sketch

Dr. Richard D. McIver, Director of Research for Geochem Research Incorporated, Houston, Texas, is currently directing research on the assessment of conventional and unconventional fossil-fuel resources. Prior to this he was a Senior Research Associate with Exxon Production Research Company. In his 23 years with Exxon, he held a variety of assignments with their U.S. and foreign affiliates, working in exploration, research, exploration economics and planning, minerals, coal, and oil shale; but his primary interest has been in the organic geochemistry of petroleum. He received a PhD in chemistry from Ohio State University and a B.A. in chemistry from John Brown University.

He has written extensively on kerogen, crude oil chemistry, source rocks of petroleum, natural gases (including gas hydrates), and the organic geochemistry of Deep Sea Drilling Project cores. He is a member of AAPG, the Geochemical Society, and the American Chemical Society. He serves as an Associate Editor of the AAPG *Bulletin*, a member of the Advisory Committee on Organic Geochemistry of the JOIDES Deep Sea Drilling Project, and a member of the Committee on Organic Geochemistry of the International Association of Geochemistry and Cosmochemistry. He also served as Chairman of the Organic Geochemistry Division of the Geochemical Society in 1973, and is currently Chairman of the 1978 Gordon Conference on Organic Geochemistry.

HYDRATES OF NATURAL GAS—IMPORTANT AGENT IN GEOLOGIC PROCESSES (Abstract)

Solid, ice-like mixtures of natural gas and water, called "gas hydrates" or "clathrates," have been found under the permafrost in Arctic basins; and they are almost certain to occur in the first few hundred meters of some sediments under deep (>300 m) water in the oceans.

Gas-water clathrates may be important in explaining some geologic phenomena because they are ice-like; thus hydrated formations retain their water, and normal consolidation cannot take place. Hydrates can also act as barriers and prevent movement of other fluids through them; they may form reservoir seals and traps where there is neither structure nor facies change. Moreover, hydrates decompose when increased temperatures or decreased pressures render them unstable, and the large supply of gas released may help maintain formation pressure when contiguous reservoired hydrocarbons are produced.

When the pressure-temperature regime of a hydrated formation is disturbed by deeper burial, change of sea level, etc., and the hydrate decomposes, the once-solid sediment contains anomalous volumes of water and large volumes of gas, and the internal pressure is increased. If the volume of decomposed hydrate is large, enormous stresses may be imposed on surrounding sediments and may trigger movement of overlying sediments as mudslides or turbidites down slopes, or of the unconsolidated sediment as diapirs, mud volcanoes, etc., at points of weakness.