

INTERNATIONAL EXPLORATIONISTS GROUP EVENING MEETING—MARCH 20, 1985

ARTHUR R. GREEN—Biographical Sketch



Arthur R. Green is a research scientist at Exxon Production Research Company involved in managing integrated basin analysis projects on a worldwide basis and in research planning for the laboratory. Art received his B.S. in geology from Washington State University in 1957. After receiving a commission in the United States Air Force he entered flight school and graduated as a navigator. He then joined the Strategic

Air Command flying from various Arctic Stations, crisscrossing the Arctic Ocean many times until completing his service as a captain. He entered graduate school at the University of Oregon in 1960 and graduated (M.S. Geology) with honors in 1962. After graduation he joined Humble as an exploration geologist and worked in many areas of the United States and Canada. He later worked in various production districts in Southeast Texas.

In 1969 Mr. Green joined Exxon Production Research Company in Houston, Texas. During the first two years at EPR he was co-scientist in charge of oceanographic vessel conducting submarine geologic studies in the Caribbean and the Gulf of Mexico. In the following six years he traveled extensively, conducting a series of on-site basin analysis studies in Libya, Venezuela, Australia, and Norway (North Sea to Barents Sea). In 1978 he became a section manager of the Basin Analysis research group, involved in an integrated tectonics and sedimentation. While in this position he managed research projects and on-site integrated basin analysis studies in China, Argentina, S.E. Asia, the Gulf of Mexico, the U.S. Pacific Coast, northern Alaska, the Canadian Arctic Islands, and the Labrador Sea. Since 1983 he has been a research scientist, continuing to be involved in managing basin analysis projects and research planning.

Art Green has written a number of internal Exxon research reports on tectonics, crustal analysis and regional sedimentation, covering areas such as the Norwegian Offshore, the West and Southwest Pacific and the Northern Indian Ocean, the Pelagian Basin (offshore Libya), Venezuela, and the MacKenzie Delta of the Beaufort Sea. Mr. Green has contributed to many industry-wide publications, among which include AGU Memoir No. 20, Proceedings of the World Petroleum Congress, Paris, 1980 and London, 1983, proceedings of the Offshore Northern Sea Conference, Norway, 1982, and presentations at the International Union of Geodesy and Geophysics, Hamburg, 1983 and the William E. Pratt Memorial Conference on Future Petroleum Provinces of the World, December, 1984.

Mr. Green is a member of the JOIDES Drilling Safety Panel and a member of the new Ocean Drilling Program. He is a member of the Princeton University Advisory Council and the Ad Hoc Committee on the Antarctic as well as the AAPG Committee on Marine Geology. Art has completed a term on

the U.S. National Science Foundation Research Council. He was recently appointed as a member of the Sub-Committee on Arctic Research of the Inter-Union Commission on the Lithosphere and has been appointed as a member of the U.S. Geodynamics Committee. In addition, Mr. Green is a Fellow of the Geological Society of America where he serves on the Nominating Committee, a member of Sigma Xi, the American Association of Petroleum Geology, the American Geophysical Union, and the Houston Geological Society.

THE GEOLOGICAL FRAMEWORK AND HYDROCARBON POTENTIAL OF SEDIMENTARY BASINS OF THE ARCTIC

The Arctic Ocean basin, which separates the Eurasian and North American continents, is more than 4 km. deep, covers more than 13 million square kilometers, and contains over 30 sedimentary basins and many of the world's least understood major physiographic features. The shelves that surround the deep oceanic basin are some of the widest of the world. Nearly 60 percent of the Arctic Ocean is less than 1 km. deep, and over 80 percent of the ocean is less than 3 km. deep. The sedimentary basins of the Arctic contain thick sedimentary sections of Precambrian, Paleozoic, Mesozoic, and Tertiary sections.

The crust beneath the sedimentary basins of the Arctic has a long and dynamic history. During much of the Phanerozoic, convergent plate motion caused thrust faulting, magmatism, subduction and the accretion of deep marine sediments and suturing of exotic terranes to the continents around the Arctic. Sedimentary basins were formed within this complex crustal setting by large-scale rifting, shearing and compression. A disproportionate number of interior rift basins have formed in the Arctic with their large basement-evolved traps, widespread high-quality reservoirs, moderate to warm heat flow, good seals and effective plumbing systems.

Paleolatitudes have ranged from near the equator to the present polar position, with climates varying from tropical to arid to boreal. In a number of the sedimentary basins the positive paleoenvironmental factors which influence source rock deposition and reservoir quality have combined with the favorable tectonic setting of interior rift basin formations to create a number of productive sedimentary basins with exciting potential.

The presentation will systematically review a series of time slice maps from the late Devonian to the early Tertiary which depict the tectonic, stratigraphic and paleoenvironmental evolution of the sedimentary basins of the Arctic. This will be followed by an analysis comparing contrasting the basins and a summary of the known oil and gas occurrences in the Arctic to date.

Although the Arctic is one of the most climatically hostile and financially demanding areas of the world, it is also one of the most exciting and promising hunting grounds that remains to be explored.