

INTERNATIONAL EXPLORATIONISTS GROUP EVENING MEETING—APRIL 17, 1985

JOSEPH T. FORREST—Biographical Sketch



Joseph T. Forrest is President of Exploration Methods Inc. He holds a Bachelor's degree in geology from Middlebury College and a PhD in geology from Rice University. After spending a year and a half as a post-doctoral fellow at the Swiss Federal Institute of Technology in Zurich, Joe went to work for Amoco International in Chicago in 1974. With that company, he worked mainly on the Caribbean/Central American

region and the North Sea. In 1977, he moved to Houston to work for Allied Chemical in their international exploration group. Main areas of responsibility there included the North Sea and the Far East. In 1979, Joe joined the exploration arm of Texas Eastern Corp., where he was involved at different times with both that firm's U.S. and international programs.

In early 1985, Mr. Forrest and a colleague from Texas Eastern, Mr. W. H. Lang, formed their own company, Exploration Methods Inc. EMI is presently preparing a regional exploration study of the North Slope of Alaska and the Beaufort-Mackenzie Basin of Canada. This study is being marketed to industry on a nonproprietary basis.

Mr. Forrest is a member of the Geological Society of America, the American Association of Petroleum Geologists, the Society of Exploration Geophysicists and the Geophysical Society of Houston in addition to the Houston Geological Society.

The paper Mr. Forrest will present is a modified version of a paper coauthored with Dr. E. L. Horstman and presented to the Wallace Pratt Conference on Future Petroleum Provinces in Phoenix in December 1984.

THE NORTHWEST SHELF OF AUSTRALIA - A GEOLOGICAL AND EXPLORATION OVERVIEW

The Northwest Shelf of Australia extends over 1000 mi (1600 km) in a northeast-southwest direction and averages more than 200 mi (320 km) in width; it can be divided, from southwest to northeast, into the Carnarvon basin, the offshore Canning basin, the Browse basin, and the Bonaparte basin. Each of these is further divided into subbasins based on stratigraphic and structural boundaries. Sedimentary thicknesses are probably in excess of 30,000 ft (9000 m).

Structurally, the entire Northwest Shelf is dominated by Early to Mid-Jurassic rifting. Although the tensional tectonic style predominates, compressional features are present, probably resulting in part from rebound of the tensional stress and possibly from strike-slip movement in the basement. In the Bonaparte basin, salt movement has created both piercement and deep-seated salt structures.

Proven petroleum reservoirs of the Northwest Shelf are Permian, Triassic, Jurassic, and Cretaceous sandstones. The major petroleum source is Upper Jurassic shale, which has generated both oil and gas in the Carnarvon and Browse

basins. Gas in Permian sandstones in the Bonaparte basin probably has a source within the Permian.

By the end of 1983, approximately 200 exploratory wells had been drilled on the Northwest Shelf, for a drilling density of less than one well per 1000 sq mi (2600 sq km). Over 100 of those wells are in the Carnarvon basin, which covers less than 20% of the total area of the shelf. Significant discoveries have been made in the Carnarvon, Browse, and the Bonaparte basins, but only the Carnarvon is currently producing; its proved reserves are estimated at 462 million bbl of oil and condensate, 155 million bbl of LPG and 11 tcf of gas (1982 statistics).

Except for the Carnarvon basin, where well density is still low, the Northwest Shelf is essentially unexplored. All of the basins are indicated to have most of the elements required for the generation and accumulation of petroleum. Recently announced discoveries in widely divergent areas of the shelf have generated renewed interest in this large unexplored offshore area and may stimulate the exploration activity necessary to make the Northwest Shelf a major petroleum province of the future.