GUEST NIGHT AND AWARDS BANQUET JUNE 13, 1983

JOHN B. ANDERSON — Biographical Sketch

John B. Anderson is an associate professor of geology at Rice University. He received his B.S. degree in geology from the University of South Alabama in 1968, his M.S. degree in geology from the University of New Mexico in 1970, and he Ph.D. degree in geology from Florida State University in 1972. He was an assistant professor of geology at Hope College, Michigan, from 1972 until 1975, when he joined the faculty at Rice University.

Dr. Anderson's research interests are in clastic sedimentology and marine geology. Specific areas of interest include Antarctic marine geology, glacial marine sedimentology, and grain-size analysis. Since 1978, he and his students have conducted marine geologic investigations over much of the Antarctic continental margin, using the United States Coast Guard icebreaker *Glacier* and the U.S.-Argentine research vessel *Islas Orcadas*.

THE ANTARCTIC CONTINENTAL MARGIN

Antarctica will surely be the last continent in the world to be exploited for its oil and gas, if indeed these resources are ever exploited. Yet, the knowledge we gain from geologic research on the continent and in the seas that surround it will help us reconstruct ancient plate configurations, sea levels, and paleo-oceanographic and paleoclimatic conditions. Furthermore, ongoing studies of marine sedimentary processes that occur on the continental margin of Antarctica can be used to interpret ancient glacial marine sequences, which are widespread in time and space.

The continent is almost entirely (97%) covered by its ice sheet, which is thousands of meters thick. Drainage from the continent is not too unlike that of other continents, except ice streams, rather than rivers, are the recipients of most of this drainage. As these ice streams approach the sea they converge to form large ice shelves and ice tongues. The ultimate repository for sediments stripped from the continent are the seas surrounding it, particularly those continental shelves which bound large ice shelves and ice tongues. Most of this sediment is transported to large depocenters, which, like fluvial deltas, are characterized by extensive and thick prograding sequences. However, sands are rather rare components of these sequences. Along those portions of the continental shelf where glacial drainage is limited, the supply of terrigenous sediment to the sea floor is very slow, and, in fact, glaciers typically have eroded more sediment than they have deposited.

Sedimentation on the Antarctic continental margin also is unique compared to other continental margins of the world. The continental shelf averages 400 meters in depth, has extremely rugged glacial topography, and typically slopes *toward* the continent. Consequently, waves and wind driven currents play only a minor role as sedimentary agents, and it is the impinging deep sea currents and sediment gravity flows which are the primary agents controlling the distribution of sand. Turbidites are common on both the shelf as well as the deep sea floor and several large submarine fans occur around the continent. The largest of these is the Weddell Abyssal Fan, which is probably in excess of a million square kilometers. Just how these fans are supplied with sediment, given the present great depth of the shelf, is one of our most intriguing, but as yet unsolved, questions.