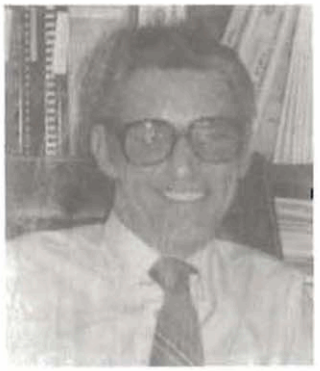
DINNER MEETING—APRIL 9, 1984

ARNOLD H. BOUMA—Biographical Sketch



Arnold H. Bouma is Chief Scientist in charge of the Lithostratigraphy Group at Gulf Research and Development. He has been Geologist-in-charge, U.S.-G.S. and Professor of Geological Oceanography, Texas A&M. Dr. Bouma received his B.S. in 1956 from University Groningen, and his M.S. (1959) and Ph.D. (1961) from University Utrecht, both in the Netherlands. His research interests include: deep sea fans, turbidites, seismic stratigraphy, and sedimentary environments in general. He has published over 130 books, articles and abstracts. Dr. Bouma holds membership in AAPG, SEPM, GSA, AAAS, IAS, and the Royal Dutch Geological and Mining Society.

DSDP LEG 96, MISSISSIPPI FAN

The Mississippi Fan is built by a number of elongate fan lobes that are stacked slightly laterally and they also prograde basinward. Each fan lobe is basically a channel-levee-overbank system that can be divided longitudinally into an upper fan-lobe, a middle fan-lobe, and an outer fan-lobe. Each fan lobe is connected to a different submarine canyon: the youngest lobe being connected to the Mississippi Canyon.

The Mississippi Canyon was formed 20,000 to 25,000 years ago by retrogressive slumping. The upper fan-lobe is characterized by a large erosive channel that is nearly filled. The northern part is confined between diapirs, the southern part contains a central channel in its fill. The middle fan-lobe is convex upward, about 400m thick, and has a 3-4 km wide sinuous channel at its apex. This channel is migratory in nature and the channel fill contains gravel at its bottom (top of an acoustically high-amplitude zone). The lower fan-lobe is also aggradational, the channel becomes smaller and less sinuous and it changes character from migratory to frequent shifting laterally. The channel has a short life span and may show bifurcation at its downcurrent end just before this shallow channel changes into a sheet-sand type deposition.

The source material for the fan has a very low sand/clay ratio. The central channel acted as a conduit for coarser sediment leaving part behind as a lag deposit and dumping the remainder on the outermost lower fan where we found sand deposits up to 10m in thickness and net sand percentages in two units of 47% and 65%. These percentages represent two major depositional events during the last Wisconsin glacial. Little sand and coarse silt accumulated on the levees and overbank areas.

Accumulation rates are extremely high: nearly 12m/1000 years on the mid fan (both channel and overbank) and 5-7m on the lower fan.

The distribution of sediments found on the Mississippi Fan may be representative of many major fans. However, it differs from models presented in the literature. The main reason may be that outcropping ancient turbidite sequences were deposited in active margin settings rather than passive margins.