

lithologic criteria for distinguishing these two environments were evident in the surface sediments or in core samples taken 3 feet and 6 feet below the surface.

Foraminiferal biofacies, however, do differentiate clearly the estuarine and the nearshore neritic environments. The species and their percentages in the bottom sediments of Sabine Lake differ from those of the Gulf of Mexico, and from those in the core samples from 3 and 6 feet. The biofacies of the core samples from under the lake are similar to those of the present Gulf, indicating greater circulation of saline waters from the Gulf of Mexico before the south end of Sabine Lake was restricted.

25. CHENIER PLAIN AND ITS STRATIGRAPHY, SOUTHWESTERN LOUISIANA, John V. Byrne, Duane O. LeRoy, and Charles M. Riley, Humble Oil and Refining Company, Houston, Texas.

The Chenier Plain of southwestern Louisiana is a low coastal marshland characterized by numerous relict beach ridges, or cheniers, which parallel the shore and rise generally 5–10 feet above the marsh level. From analyses of cores along a north-south line of section through Creole, Louisiana, it has been possible to identify four faunal zones and seven distinct sedimentary facies in the post-Pleistocene deposits which underlie the plain. The faunal zones, named after the dominant foraminifers, are: the *Streblus*, *Streblus-Elphidium*, *Quinqueloculina*, and *Trochammmina* zones. The sedimentary facies consist of varying proportions of sand, silt, and clay which, together with their contained fauna, clearly reflect the environments of deposition, including marsh, bay, mudflat, open gulf, and beach.

The relict beaches or cheniers are lenticular sand and shell bodies similar to certain shoestring sands of older rocks which commonly serve as oil reservoirs; thus, they hold special interest for the petroleum geologist. They are biconvex in section, average less than 1,000 feet across, and extend as uninterrupted coastwise ridges up to 30 miles in length. They average about 10 feet in thickness and are characterized by a smooth, generally arcuate seaward front and irregular landward margin. These deposits rest on shallow gulf-bottom mud and are overlapped by organic marsh clay. Should the ridges eventually be buried by such deposits, they will form potential stratigraphic traps. The characteristic shape, trend, and dimensions of the chenier sands, together with their distinctive sedimentary and faunal properties should aid materially in identifying similar potential reservoirs in the subsurface.

26. GEOLOGIC HISTORY OF CHENIER PLAIN, SOUTHWESTERN LOUISIANA, H. R. Gould and E. McFarlan, Jr., Humble Oil and Refining Company, Houston, Texas.

Studies of the surface features and underlying Recent sediments of the Chenier Plain have made it possible to trace its geologic history and the events which immediately preceded its development. Through radiocarbon dating of more than 100 surface and subsurface samples, it has been possible to develop a sound chronological framework of these events.

The wedge of Recent sediments records the final stage in postglacial rise of sea-level followed by a subsequent stillstand at its present elevation. The basal part of the wedge consists of transgressive brackish and marine deposits laid down on the underlying Pleistocene surface as the sea rose from –18 feet 5,600 years ago to its present level about 3,000 years ago. Coincident with or shortly before reaching this level, the longshore influx of sediment, chiefly from the Mississippi River, brought about a general outbuilding of the coast; in the western part of the area this material rests on a seaward-thickening accumulation of gulf-bottom sediments that form the upper part of the sedimentary wedge. At times of abundant sediment supply, the shore moved rapidly seaward through the accumulation of marsh-capped mudflat deposits, while during periods of slight sediment influx, wave attack slowed or halted the advance and locally brought about shore retreat. It was during these periods of relative shoreline stability that the beach ridges or cheniers, which now stand as relict “islands” in the marsh, were developed. Ranging in age from 2,900 to less than 300 years, these ridges record progressive changes in configuration of the shoreline as it advanced locally more than 10 miles to its present position.

27. SIZE, SORTING, MINERALOGY, AND CHEMICAL COMPOSITION OF RECENT SANDS OF NORTHERN GULF COAST, K. Jinghwa Hsu, Shell Development Company, Exploration and Production Research Division, Houston, Texas.

An investigation was completed to determine the origin and the major transportation paths for the Recent beach sands of the northern Gulf Coast and to relate the texture and mineralogy of the Recent sands to their depositional environments. About 200 Recent sand samples were collected from the rivers and beaches of the Gulf Coast states. Mechanical analyses were made to determine the grain size and sorting. Spectrochemical methods were used to determine chemical composition, and thin-section Rosiwal analyses for mineralogical composition.

The major conclusions of this investigation follow.

1. The Recent beach sands east of the Mississippi River Delta are mature quartz sands, which contain practically no feldspar and which contain a mature heavy-mineral suite rich in staurolite and kyanite. The Recent beach sands west of the Mississippi River are feldspathic. The feldspar abun-