Three prominent periods of Mesozoic carbonate-shelf development in the Gulf Coast are represented by the Smackover-Haynesville, the Hosston-Sligo, and the Glen Rose-Edwards-Georgetown. In spite of obvious differences in character of shelves of these three intervals, certain similarities of depositional pattern should be helpful in predicting stratigraphic trends in unexplored areas or at untested depths. The most useful parameters for mapping were found to be percentages of the carbonate section having (1) dolomite and (2) oölites. Regionally the depositional patterns and consequent porosity patterns were dependent on climate and supply of clastics as well as on water depths and the distribution of the Louann Salt. Smackover depositional and structural patterns were affected by faults involving the pre-Mesozoic rocks. Reefs and shellbanks became more important in determining depositional patterns in the Cretaceous. Reef distribution appears to be related to the extent of the salt dome basins.

As additional subsurface control becomes available, patterns of reefing will be found to be more complex than can be demonstrated at present, with a possibility of echelon arrangement of some barrier reefs, and with more of the reefing demonstrably related to salt movement. There is also a possibility that some of the earliest salt movement may be related to loading by growth of thick carbonate shelves, as well as to triggering by movement on major faults.

The present economic limitations in some of the carbonate trends will be overcome by improved deep drilling techniques, more effective seismic methods, particularly at great depths and in the salt dome basins, and by new knowledge of the regional geology as a factor in determining porosity patterns.

DAVID W. SCHOLL, U. S. Naval Ordnance Test Station, China Lake, Calif.,[1] AND FRANK C. CRAIGHEAD, Everglades Natl. Park, Homestead, Fla.

RECENT GEOLOGIC HISTORY OF WEST COAST OF FLORIDA: COASTAL MANGROVE SWAMPS, AND FLORIDA BAY

The Recent (last 10,000–11,000 years) geologic history of the northeastern corner of the Gulf of Mexico, *i.e.*, western and southern continental shelves of peninsular Florida, is recorded by the character and stratigraphy of outer-shelf and nearshore deposits. These deposits chiefly reflect the interplay of a generally rising sea level and the proximity of sources of terrigenous detritus, especially detrital quartz. For example, seaward of west-central Florida the outer shelf is essentially a bedrock surface overlain by a thin veneer of bioclastic sediment and biogenic reef growths that initially formed in a shallow nearshore environment. In contrast, the inner part of the shelf is flooded with shelly quartz sand or silt. Some of this detrital debris has been transferred to the shore to form prisms of quartzose beach sand, tracks of prograding beach ridges, and high coastal dunes. The quartz is chiefly derived from reworking of residual shelf and terrace deposits and drowned coastal plain sediments of Pleistocene age. Sources of detrital quartz disappear toward the south; consequently the inner belt of quartzose deposits narrows and becomes increasingly mixed with shell debris and finer calcilutaceous components in this direction. As an important constituent of shelf sediments, detrital quartz essentially vanishes by the latitude of Cape Sable (25°15'N). Attesting to this, the carbonate content of unconsolidated sediment in Florida Bay (just south of the cape) averages nearly 90 percent. This sediment is primarily composed of comminuted molluscan, foraminiferal, and algal debris, 80–85 percent of which consists of "metastable" aragonite and high-magnesian calcite.

The calcarenitic and calcilutaceous deposits of Florida Bay are as much as 4 m thick and overlie a thin stratum of fresh-water peaty and calcareous sediment resting on a karsted bedrock surface of Pleistocene age. The basal fresh-water deposits have a radiocarbon age of approximately 4,000 years, which implies that sea level at this time was about 4 m lower than its present position. Also beginning about 4,000 years ago marine water slowly inundated the western margin of the fresh-water swamps of the Everglades, thereby providing the necessary paralic environment for the growth of the magnificent coastal mangrove forest and swamps of southwestern Florida. Strata underlying submerged waterways, intra-forest bays, and tidal channels of the swamps form a simple transgressive sequence consisting of a basal fresh-water unit of peat and calcitic mud, a middle unit of paralic and brackish-water peat, and an upper marine unit of organic-rich quartzose sediment or shell debris. Deposits underlying the floor of the mangrove forest, or associated salt-grass marshes, range from peaty and calcareous quartzose sand and silt to compact, fibrous autochthonous peat. These organic-rich units also indicate approximately 4 m of marine submergence during the last 4,000 years. Concomitant with this submergence a complex sequence of peaty and calcareous sediments accumulated along the western margin of the Everglades.

If lithified, the modern shelf and coastal deposits of the northeastern corner of the Gulf of Mexico would be mapped as a somewhat discontinuous and slightly time-transgressive stratigraphic sequence consisting of a variety of shallow-water facies composed of mixtures of three lithologic end members: (1) calcarenite and calcilutite, (2) quartzose sandstone and siltstone, and (3) coal. These facies, and their stratigraphic relations, duplicate some of the essential aspects of Paleozoic cyclothems.

[1] Present address: U. S. Geol. Survey, Menlo Park, Calif.

KENNETH O. SEEWALD, Mobil Oil Corp., Midland, Tex.

STRATIGRAPHY OF UPPER CRETACEOUS AUSTIN GROUP, CENTRAL TEXAS

The Austin Group in central Texas represents a distinct cycle of carbonate deposition that consists predominantly of soft, white, sparse to well-packed, pelecypod and foraminiferal biomicrite, popularly called chalk. The abundance of biomicrite and the general absence of biosparite suggest deposition below wave base on a broad carbonate shelf.

Between Dallas and San Antonio the Austin Group can be divided into four geologically distinct areas based on facies changes and thickness. These changes reflect the presence of two slightly positive areas, the San Marcos arch and the Belton high, that represented a more stable part of the shelf than the adjacent, more rapidly subsiding areas. The negative area between the San Marcos arch and the Belton high has been named the Roundrock syncline and the negative area north of the Belton high is referred to as the Dallas basin.

In the Roundrock syncline, from the type area in Travis County north through Bell County, the Austin Group ranges in thickness from 350 to 550 ft and is