in the sediments is primarily pelecypod shell fragments. Concentration of carbonate material is a function of currents and wave activity. A few species of Foraminifera and Ostracoda which can tolerate severe fluctuations of salinity comprise the microfauna.

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Quartz Microtextures as Indicators of Subaqueous Density Flow

Quartz samples from density flow deposits from the Colombia basin (Caribbean Sea) were analyzed for surficial microtextural associations using the scanning electron microscope. Microtextural abrasion patterns were found to vary in the "A" division of turbidites, grain-flow deposits, debris-flow deposits, and in material resulting from washover on the Magdalena deep-sea fan. The observed microtextural patterns are useful criteria for the identification of the transport mechanisms of other deposits assumed to have resulted from density flows.

Relative distances of travel of contemporaneous turbidites could be ascertained from impact densities on "A" division sand grains. The limiting conditions on such analyses are a minimum of postdepositional alteration of the mechanical textures of the grains and a lack of intense abrasion features received during episodes of predensity-flow transport.

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Geology of Suwannee Basin Interpreted from Geophysical Profiles

The Suwannee basin developed in Mesozoic time as a broad syncline on a smoothly eroded Paleozoic terrane. It is in the eastern Gulf Coast area and includes parts of Florida, Alabama, and Georgia. Its axis extends northeasterly from Apalachicola, Florida, into southwestern Georgia.

Deep drilling in the eastern Gulf Coast region has penetrated the Tertiary and Mesozoic section, but wells seldom have extended very deeply into pre-Mesozoic rocks. Geophysical Service Inc. conducted a survey in the Suwannee basin consisting of reflection-seismic profiles plus gravity and magnetic readings. The seismic sections provided the basic framework for a geologic interpretation. Drilling information helped to establish control for the upper part of the sections, and also aided in verifying interval-velocity determinations. Velocity analyses were spaced one mi apart, with about 14 interval determinations at each point. These computations permitted display of the sections in depth as well as time. Models of gravity and magnetic fields were generated by computer programs which permitted comparison of interpreted and observed fields. Thus the geologic interpretation could be altered to test various hypotheses, and refinements continued until data were reconciled.

Our interpretation shows Tertiary and Cretaceous sedimentary rocks lying upon a remarkably smooth unconformity developed across Paleozoic and Triassic rocks. The unconformity dips southward from a depth of 2,560 m near the Alabama-Florida boundary to about 3,600 m near Panama City, Florida. Below the unconformity is a folded and faulted sequence of lower Paleozoic rocks and Triassic continental strata accompanied by volcanic flows or intrusives. Paleozoic rock types appear to include volcanics, quartzite, and a sandstone-shale sequence. Individual structures are large and varied, and include broad anticlines developed above thrust faults. The Paleozoic rocks are correlated with African counterparts, and it is suggested that their hydrocarbon potential warrants further investigation.

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Stratigraphic Relations and Petroleum Potential of Smackover-Buckner Sequence (Jurassic), Clarke County, Mississippi

In eastern Mississippi, the upper member of the Smackover Formation and the lower member of the Buckner Formation represent a major regression of the Jurassic shoreline. The upper Smackover carbonate strata were deposited under shallow open-marine conditions, and the vertical sequence indicates progressive shoaling and basinward progradation of environments. The overlying lower member of the Buckner Formation consists of thick units of nodular anhydrite with interbedded dolomite, and is inferred to be the supratidal equivalent of the upper Smackover marine carbonate rocks.

The principal reservoir rocks in the Smackover Formation are oolitic grainstones with primary depositional interparticle porosity. The high-energy oolitic deposits formed by tidal action on shoals which were aligned roughly parallel with the coastline. An understanding of the structural and sedimentologic factors which controlled the location of the oolite shoals is critical to exploration in adjacent areas. The oolitic deposits appear to have built up as a consequence of the intersection of wave base and a gently sloping sea floor, as there is no indication of a controlling shelf break.

Although there is strong evidence of penecontemporaneous growth of salt-cored anticlines during deposition of the upper Smackover sediments, these structures are not thought to be the principal factor in controlling the location of the high-energy shoals.

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Early Cretaceous Stuart City Shelf Margin of South Texas: Its Depositional and Diagenetic Environments and Their Relation to Porosity

The Stuart City trend, South Texas, represents a climax biogenic development along the Early Cretaceous (late Aptian, Albian, and early Cenomanian) shelf margin. Landward of this trend, a wide variety of shallow-water shelf carbonate sediments accumulated on a broad, relatively flat platform. Seaward, the entire section consists of dark planktonic foraminifer-bearing argillaceous carbonate sediments. The sediments of the Stuart City trend make up the Stuart City limestone, which attains a total thickness of 2,000 to 2,500 ft. Time-equivalent rocks which crop out in central Texas are the Glen Rose and Edwards Formations. Between 1954 and 1961 many wells ranging in depth from 11,000 to 20,000 ft were drilled with the Stuart City Formation as their final objective. Of the 19 wells from which cores were obtained for this study, 12 were considered gas wells with initial production ranging from 1.5 to 36.5 MMCFGD. Six of these wells still produce gas. Depositional facies and environments and their relation to the diagenesis and porosity development provide a model for further hydrocarbon exploration along the Stuart City and the deeper Sligo trends.

The Stuart City carbonate rocks have been assigned to five major environments of deposition: shelf lagoon, shelf margin, upper shelf slope, lower shelf slope, and open marine. The shelf-lagoon facies include miliolid wackestone, mollusk wackestone, toucasid wackestone, and mollusk-miliolid grainstone. These facies accumulated in generally low-energy condition in water depths from 0 to 20 ft. In contrast, the narrow band of shelf-margin carbonate rocks is made up of coral-caprinid boundstone, requienid boundstone, and rudist grainstone, all of which accumulated in moderate to high-energy conditions and in less than 15 ft of water as a complex of reefs, banks, bars, and islands. Seaward of the shelf margin, the upper shelf-slope environment comprises the caprinid-coral wackestone and coral-stromatoporoid boundstone facies, the lower shelf slope, the intraclast-grainstone, echinoid-packstone, and echinoid-mollusk-wackestone facies. Farther seaward in water depths greater than 60 ft, the open-marine environment is represented by the planktonic-foraminifer wackestone basins.

Porosities in the carbonate rocks of the Stuart City trend are divisible into two main types, those which are fabric related and