western Gulf; 18 species (17%) appear to be undescribed in previous literature. Many of the newly reported species are abundant at West Flower Garden Bank and several other species, known only sparsely from other Gulf and Caribbean reefs, are important constituents of the West Flower Garden Bank foraminiferal community. These results emphasize the value of direct sampling techniques that recover hard reef substrates.

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Organic Geochemistry of Deep Well in Hinds County, Mississippi

Detailed organic geochemical analyses of the fine-grained rocks from the 6.9-km-deep McNair 1 well in Hinds County, Mississippi, include organic carbon, extraction and elution chromatography, gas chromatography and mass spectrometry of $C_{15}+$ saturated and aromatic hydrocarbon fractions, rock pyrolysis, and kerogen analysis. Rocks range in age from Paleocene to Early Jurassic. The well had an estimated bottom-hole temperature of 225°C, although paleotemperatures were probably higher.

Some data from this well are inconsistent with currently accepted organic geochemical hypotheses concerning the generation and thermal destruction of hydrocarbons. For example, appreciable (up to 1,550 ppm) $C_{15}+$ hydrocarbons are present in Jurassic rocks at temperatures of 200 to 225° C. Substantial amounts (80 to 180 mg/g) of pyrolyzable hydrocarbons remain on the kerogen in these same rocks. Temperatures and/or duration of heating appear to have been inadequate for complete peak generation and thermal destruction of hydrocarbons to have occurred in these rocks. In addition, unexpected trends (versus depth) are present in the $C_{15}+$ saturated hydrocarbons as well as in the kerogen composition. Mass spectrometric analyses show that the n-paraffins and iso-paraffins decrease with an increase in depth and that the three-ring to five-ring naphthenes increase with increase in depth; both trends occur over the depth range from 1.8 to 5.2 km. Further, elemental analyses of kerogen show that the H/C, O/C, and N/C atomic ratios of kerogen increase over the depth range from 5.3 to 7.0 km.

Significant changes in the organic geochemical characteristics of this well bore correlate with changes in lithology.

The data from this and other wells studied, suggest that some of the accepted concepts regarding generation and maturation of petroleum hydrocarbons may need further refinement.

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Origins of Permanent Inlets Separating Barrier Islands and Influence of Drowned Valleys on Tidal Records Along Texas Gulf Coast

Sedimentary and hydrographic patterns of western Gulf of Mexico barriers and barrier lagoons have been influenced by dominant southwestward longshore drift. This influence has been both direct and indirect as the drift deflected rivers southwest from their mouths.

The entrenched, drowned, filled, and undrained late Pleistocene river valleys pass diagonally under the Holocene lagoons and barrier chains at depths of 100 ft (30 m) or more. These drowned river valleys invariably follow deeply entrenched fault systems of Mesozoic origin.

Of the 40 or more historic storm washovers per 100 mi (160 km) of barrier chain, only seven natural passes have remained well established during the past 150 years. Five of the seven barrier breaks cut diagonally over broad submerged or subsurface valleys of present-day rivers. Two are located at downdrift bay ends.

Cyclic migrations and abnormally high relative sea-level-rise rates, indicated by tide gauges located at barrier inlets, suggest vertical instability. A recorded example of such instability is subsidence of 1.2 ft (0.4 m) during the past 47 years of the east end of the Galveston seawall, overlying the subsurface valley of the Trinity River. Tide-gauge records for the same period at Pensacola, Florida, presumed tectonically stable, reveal slight eustatic changes, but not the 1.2 ft (0.4 m) higher levels found at Galveston. The Galveston seawall subsidence antedates the onset of subsurface fluid extraction in the Houston-Galveston area.

The counterclockwise spiraling of hurricanes crossing the barrier chains produces surges through barrier gaps and topographic lows. Inlet migrations over unstable valley fill have been halted at the south against the large fans characteristically formed at inlets. These fans help segment lagoons into a series of bay basins. The inlet-fan morphology forms a funnel mouth for the ebb-tide jet flowing out of the inlet, dominating flow patterns of bays.

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Evidence for Post-Jurassic Tectonism in Eastern North America

The Gulf Coastal Plain province extends eastward along the North American continental margin, and makes up a large part of the terrain of eastern North America. Both the Gulf Coast and eastern North America have been regarded as regions quiescent since the Jurassic Period because there appears to have been no obvious tectonic activity there, or any reason for it to occur. However, recent investigations, especially in eastern North America, suggest that this view may be too conservative.

Post-Jurassic tectonic activity in eastern North America is indicated by widespread faulting, extensive subsidence and uplift which continue to the present, igneous activity, and a regional horizontal compressive stress. Much of this activity seems to be associated with compressional deformation, and vertical uplift and subsidence. The regional extent of these events is very large, though the magnitude of the diastrophism is less spectacular than in other regions generally associated with orogenic activity. Any model that attempts to explain post-Jurassic tectonism in eastern North America must account for these types of activity.

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