Btu. In Texas, air-quality standards (AAQS and PSD) could restrict the siting of future power plants. Future use in atmospheric fluidized bed combustion and medium-Btu gasification is probable. Underground gasification should be commercialized by 1990.

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Revision of Tampa Formation, West-Central Florida

The Tampa Formation of west-central Florida historically has been defined primarily from biostratigraphic and geochronologic criteria. Formation definitions based on these criteria are not in accordance with the American Code of Stratigraphic Nomenclature. Furthermore, a type section of the Tampa has never been established. Currently, the Tampa Formation is recognized by ill-defined and conflicting criteria with boundaries that are vague. At the originally described localities on Tampa Bay, there is an interval of rocks that is mappable, has recognizable boundaries, and is capable of being defined in accordance with the code. It is proposed that this unit be designated the Tampa Formation. The unit is generally a quartz sandy limestone, having at least 10% quartz sand and less than 1% phosphate. The boundary with the units above the Tampa is defined by phosphate-bearing (5 to 50%) dolomites, clays, and quartz sands. The lower boundary is marked by a relatively pure carbonate unit containing only trace phosphates or quartz sands. The Tampa has been indirectly correlated with the Oligocene Chickasawhay Stage of the Gulf Coast. A type section for the Tampa is established in the Ballast Point core held by the Florida Bureau of Geology. The core was taken at Tampa Bay, Florida.

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Suitability Studies of Salt Domes in East Texas Basin for Geologic Isolation of Nuclear Wastes

The suitability of salt domes in the East Texas basin (Tyler basin), Texas, for long-term isolation of nuclear wastes is being evaluated. The major problems concern hydrologic and tectonic stability of the domes and potential natural resources in the basin. These problems are being approached by integration of dome-specific and regional hydrologic, geologic, geomorphic, and remote-sensing investigations. Hydrologic studies are evaluating basinal hydrology and groundwater flow around the domes to determine the degree to which salt domes are dissolving, their rates of solution, and the orientation of saline plumes in the freshwater aquifers. Subsurface geologic studies are being conducted: (1) to determine the size and shape of specific salt domes, the geology of the strata immediately surrounding the domes, and the regional geology of the East Texas basin; (2) to understand the geologic history of the dome growth and basin infilling; and (3) to evaluate potential natural resources. Geomorphic and surficial geology studies are determining whether there have been dome growth and tectonic movement in the basin during the Quaternary. Remote-sensing studies are being conducted to determine (1) whether dome uplift has altered regional lineation patterns in Quaternary sediments and (2) whether drainage density and ruggedness ratios indicate Quaternary structural movement.

By means of the screening criteria of McClain and others, Oakwood and Keechi domes were chosen as possible candidate domes. Twenty-three domes were eliminated because of insufficient size, too great a depth to salt, major hydrocarbon production, or previous use (e.g., liquid propane storage or salt mining or brining). Detailed geologic, hydrologic, and geomorphic investigations are being conducted around Oakwood and Keechi salt domes.

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Equilibrium in Modern Coral Reefs, Western Gulf of Mexico—Role of Ecology and Ostracod Microfauna

Two groups of modern patch reefs are present off Veracruz, Mexico. Terrigenous sediments of the Rio Jamapa are being deposited between the two complexes. Longshore drift of these sediments is causing declining coral growth on the southern (Anton Lizardo) group, although corals on the northern (Veracruz) group are healthy. These differences in coral diversity should be reflected in the water chemistry and microfauna.

Environmental data collected (depth, salinity, pH, temperature, Eh, and dissolved oxygen) were treated as random samples from populations whose normality (or lack thereof) was established by chi-squared goodness-of-fit tests. Chi-square testing at the 0.01 level demonstrated that of the six sample populations, only depth, pH, and dissolved oxygen were normally distributed. Depth, pH, and dissolved oxygen data were assembled into two populations representing the Veracruz and Anton Lizardo groups, to test the null hypothesis that the variances of the respective populations were equal ($F = 0.005$ level). The variances were found to be equal. T tests (0.01 level) on the population means of depth, pH, and dissolved oxygen of both Veracruz and Anton Lizardo groups disclosed that there is no significant difference between the two groups of reefs in terms of these characteristics. Analysis of the dominant ostracod species in 33 samples collected on the reefs indicates two distinct biofacies. *Loxocorniculum tricornatum* Krutak dominates the Veracruz group; whereas *L.* cf. *L. postdorsoalata* "group" (Teeter) characterizes the Anton Lizardo stations. Two ostracod species, *L. tricornatum* and *Morkhovenia inconspicua* (Brady), are cosmopolitan, and are present at all 33 sampling stations. Rare species living on the two reef complexes are generally restricted to the Veracruz complex. Simple diversity analysis (number of species/station) demonstrates that the Veracruz reefs are more diverse than those of Anton Lizardo. However, this difference is statistically insignificant. Comparisons of Shannon-Weiner information function and equitability values between the two complexes show that these diversity measures are also insignificant and do not reflect observed environmental differences. Ostracod species abundance and dominance on the scleractinian bioherms at Veracruz and Anton Lizardo

are more sensitive indicators of reefal equilibrium than the measured environmental characteristics in overlying bottom waters.

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"Carrillo Puerto Formation" of Northeastern Quintana Roo, Mexico

The "Carrillo Puerto Formation" of the eastern Yucatan Peninsula is a biostratigraphic unit containing fossils ranging in age from Miocene to Holocene. Recent field work suggests the "formation" can be divided into several genetic units. Each unit was deposited during high stands of the Caribbean Sea, which have periodically inundated portions of the peninsula, and each is capped by a subaerially weathered crust (caliche) formed during low stands of sea level. Similar Quaternary caliche beds have been recognized in Florida, the Bahamas, and Barbados. Comparisons between these zones and those of the Yucatan Peninsula provide new information on the recent geologic history of the eastern platform margin.

At least five marine transgressions of late Tertiary to Holocene age are recorded in the rocks of eastern Quintana Roo. Along the coast, Holocene sediments and reefs overlie calichified upper Pleistocene (Sangamon Interglacial) beach-plain grainstones and coral-reef limestone. Underlying the upper Pleistocene limestone and cropping out farther inland is another Pleistocene(?) grainstone. Underlying this and exposed still farther inland is a unit of mollusk wackestones, packstones, and grainstones with coral boundstones. Still farther inland, the oldest unit exposed in Quintana Roo is a highly leached coral-head and mollusk wackestone.

The onlap of successive units has decreased with each transgression resulting in a seaward shift of platform grainstones, wackestones, and reefal limestones. "Carrillo Puerto" limestones of eastern Quintana Roo built progressively upward and outward over a block-faulted continental shelf margin during the late Tertiary and Quaternary.

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Outer Deep-Sea Fan Depositional Lobe Sequence from Jackfork Group of Southern Arkansas

Sediments accumulating on the lower parts of the continental slope and the adjacent rise have been shown to contain significant organic materials and are regarded as important prospective hydrocarbon source beds. It is likely that future technologic developments will result in important production from these environments. A search for stratigraphic traps will require an understanding of depositional processes on deep-sea fans, gained partly from study of ancient examples exposed on land. The Carboniferous sequences of the Ouachita Mountains of Oklahoma and Arkansas provide an outstanding opportunity for examination of sediments from these environments.

The outcrops of Jackfork Group turbidites (Pennsylvanian) exposed in the walls of the spillway at De Gray Dam, Arkansas, have been described by R. C. Morris. This sequence shows a rhythmic alternation between turbidite units with high sandstone/shale ratios (facies C of E. Mutti and F. Ricci-Lucchi) and units with low sandstone/shale ratios (facies D). Facies C is interpreted as material deposited on active fan lobes, and facies D consists of lobe-fringe and interlobe sediments. A pattern of frequent lobe shifting can be recognized analogous to the way the main distributary system switches from side to side of a delta. Individual lobes range in thickness from 3 to 70 m, with a mean of about 25 m. This association is characteristic of the outer fan environment of A. Bouma and T. Nilson.

The upper part of the De Gray section contains massive sandstones and pebbly sandstones interpreted as deposits of a major distributary channel. It is possible that buildup of the fan sediments had brought the area into the middle-fan environment by this time.

Many of the critical characteristics of these sediments would be recognizable on well logs, and the De Gray section is a good example of one association that might be drilled on the continental rise.

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Importance of Secondary Leached Porosity in Lower Tertiary Sandstone Reservoirs Along Texas Gulf Coast

Secondary leached porosity is common to dominant in near-surface to deep-subsurface lower Tertiary sandstone reservoirs along the Texas Gulf Coast. This secondary porosity is in the form of leached feldspar grains, volcanic rock fragments, carbonate cements, and carbonate-replaced grains. Leached porosity occurs in sandstones with compositions ranging from volcanic litharenite and lithic arkose to quartzose sublitharenite and quartzose subarkose.

A generalized diagenetic sequence indicates that leaching is a multistaged phenomenon occurring at or near surface, at burial depths of 4,000 to 6,000 ft (1,200 to 1,800 m), and at burial depths of 7,000 to 10,000 ft (2,100 to 3,000 m). Feldspar grains are dissolved during the first stage, whereas grains, cements, and replacement products are dissolved during the last two stages. Intensity of leaching in each stage varies in different formations and in different areas.

Plots of secondary porosity as a percent of total porosity versus burial depth show that secondary porosity is dominant beneath 10,000 ft (3,000 m) ranging from 50 to 100% total porosity. Above 10,000 ft nearly all samples have some secondary porosity, which is the most common porosity type in more than half of the samples. Similarly, individual plots for the Wilcox, Yegua, Vicksburg, and Frio sandstones all demonstrate the predominance of secondary leached porosity.

Primary porosity is destroyed by compaction and cementation with increasing depth of burial. If this were the only porosity type, no deep, high-quality reservoirs would exist. Leaching, however, resurrects reservoirs after primary porosity has been reduced. Most productive lower Tertiary sandstone reservoirs, especially deep reservoirs, along the Texas Gulf Coast exist only because