Reservoirs in these abandoned fields are Tertiary sandstones. The 44 abandoned fields in the upper Texas Gulf Coast (District 3) produced from a wide range of plays; those plays with the largest number of abandoned fields are Yegua and Frio deep-seated domes, Eocene deltaic sandstone, and Frio barrier/strand-plain sandstone. The 19 abandoned fields in the middle Texas Gulf Coast (District 2) produced mainly from Wilcox and Frio fluvial/deltaic sandstones and from Frio and Jackson-Yegua barrier/strand-plain sandstones. The lower Texas Gulf Coast (District 4) contains 75 abandoned fields that produced from Frio fluvial/deltaic and barrier/strand-plain sandstones and from Jackson-Yegua barrier/strand-plain sandstones.

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Crustal Structure of South Florida Bank Derived from Ocean Bottom Seismometer Refraction Profiles

In March 1982, 6 seismic refraction lines, 70-90 km (43-56 mi) long, were shot in the southeastern Gulf of Mexico using the advanced University of Texas digital ocean bottom seismometers. Five lines were on the South Florida bank region in water depths of less than 1 km (3,300 ft) and one was in water depth of about 2.4 km (7,900 ft) off the northern coast of Cuba. After data reduction, first arrival picks were made and least squares lines were fitted to the picks to obtain the apparent velocities and intercept times for the layers. Using these values, flat layer crustal models have been initially computed. The 2 most dominant deep refractors have apparent velocities of 5.6-5.9 km/sec (3.5-3.7 mi/sec) and 6.2-6.6 km/sec (3.9-4.1 mi/sec). The top of these refractors varies in depth 2-6 km (6,600-13,000 ft) from the sea surface. They are interpreted to represent the crystalline basement. Basement rocks have been reached at a depth of 3.4 km (11,200 ft) in a well drilled in the Pinellas County arch. In the South Florida bank area, the deepest refractor observed has an apparent velocity of about 7.5 km/sec (4.6 mi/sec) at a depth of about 25 km (15 mi). Absence of any mantle velocity in these long profiles confirms the continental nature of this crust. The only possible mantle arrival (velocity = 8.4 km/sec, 5.2 mi/sec) was observed in the line off the northern coast of Cuba at a depth of about 26 km (16 mi). Similar crustal thickness has been observed in a refraction profile just northwest of this line. This deep crustal structure complements the shallow crustal structures for this area.

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Ammonite Zonation in Condensed Zone, Middle Ozan Formation (Taylor Group, Upper Cretaceous) in Northeast Texas

Recognition of condensed zones is important because they may be marker horizons that are useful in exploration. Such a zone is demonstrated by the occurrence of ammonites belonging to 12 species and 9 genera from the middle Ozan Formation (lower Taylor Marl) in northeast Texas. The 1-foot (0.3-m) thick bed of bioturbated glauconitic biomicrite contains many specimens of disarticulated vertebrates, molluscs, remanié fossils (blackened phosphatic internal molds), and hiatus concretions. Four of 6 midcontinent ammonite range zones proposed by Cobban and others appear to be represented in the fauna, in ascending order, by *Baculites aquilaensis* Reeside, *Delawarella delawarensis* (Morton) (= zones of two unnamed species of *Baculites*), *Baculites obtusus* Meek, and *Trachyscaphites spiniger porchi* Adkins (= zones of *Baculites mclearni* and *B. asperiformis*). Young may be correct in assuming that the occurrence of *Delawarella delawarensis* and *Baculites aquilaensis* in the Ozan Formation may mean that rocks of the upper Austin Group and parts of the lower Taylor Group are the same age. If correlation with the midcontinent zonation is correct, then the sediments that formed the condensed zone slowly accumulated from 81 to 79 m.y. (mid early Campanian to early late Campanian). Several species of the fauna are preserved as both normal and remanié fossils, indicating that members of these species lived in the area for an extended period of time, perhaps as a relict fauna. The fauna includes a mixture of cosmopolitan and endemic species (indicating open shelf environment) with several types of heteromorphs (indicating moderate water depths).

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Subsurface Geological Data on a Microcomputer

Principal tasks in a subsurface geologic study include storing geologic data and selecting parameters such as depth, production, and total depth for posting on maps. These tasks can be carried out either with index cards, or with a system comprising a microcomputer, an off-the-shelf data-base program, a dot-matrix printer, and simple custom programs. The advantages of the latter approach are numerous, and include: (1) capacity to store thousands of pieces of information on just a few disks, (2) ability to sort and select data according to virtually any criterion (e.g., depth range, formation, etc), (3) capacity to combine selection criteria (e.g., depth of all penetrations of a particular formation in a certain area, that have certain production limits), and (4) removal of the possibility of introducing errors during the posting process. The system is limited either by the quantity and type of data that the geologist wishes to enter into the data base or by the quantity of money available to purchase the data in a form directly readable by the computer.

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Strong Transfer Function Links Thin-Section Data to Reservoir Physics

Thin sections carry considerable precise quantitative information concerning physical properties of the rock such as permeability, log response, and acoustic phenomena. This information is not obtained through conventional petrographic procedures such as point counting or simple linear measurements made with a graduated ocular. Instead, multispectral-image-analysis techniques are required. Critical parameters of such a system include: (1) selection of correct magnifications; (2) selection of proper spectral bands; (3) construction of a high precision digital filter able to define precisely grain and pore boundaries at the upper surface of the section; (4) identification of an algorithm to express in useful fashion the complex geometries of grain and pore as well as correctly identify minerals and mineral phases; and (5) development of software to analyze such data. Output data is copious—for example, more than 80 variables are used to describe pore size and geometry. The result, however, is precise estimation of such properties as permeability and identification of pore characteristics associated with enhanced or reduced permeability. The procedure at present requires minicomputer-level hardware for optimal data acquisition and processing.

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Pericollisional Strike-Slip Basins in Western Cordillera, Canada

The late Mesozoic-Paleogene evolution of the Canadian Cordillera was dominated by accretion of elongate crustal blocks against the North American craton. Geologic and paleomagnetic evidence suggest that these exotic terranes dispersed from volcanic arcs and oceanic platforms and approached North America along anastomosing right-lateral faults with great cumulative displacement. Obduction of oceanic allochthons was followed by transpressive thickening and regional metamorphism of the cratonic margin in the mid-Jurassic. Strike-slip motion and emplacement of plutonic rocks continued near relict sutures and reactivated deep faults. Sedimentary basins related to strike-slip faults formed by elongation of accreted terranes ("Stikinia" and "Wrangellia") and by shear within the deformed cratonic margin zone ("Rocky Mountain Trench"). Subsidence is reflected by northwest-southeast stretching along pull-apart structures, and by massive influx of turbidites from incipient collision zones and relict arc relief. It was interrupted and outlived by rotation of blocks, folding of basin sediments, and vigorous progradation of deltaic-fluvial clastics from rising collision belts. Transition from predominant transtension to prevailing transpression is diachronous from basin to basin. Near the Stikine-Wrangellia collision zone (Bowser basin), it occurred in the Late Jurassic; along the Stikine-Wrangellia border it occurred in the mid to Late Cretaceous. Only small nonmarine basins developed in the Rocky Mountain Trench system, which, in its southernmost part, was closed completely during Paleogene thrust faulting. The strike-slip basins of the western Canadian Cordillera were subject to high regional heat flow and also suffered from widespread intrusion of Paleogene granitoids. Therefore, they are generally poor oil and gas prospects.