the basin it overprints, the Northern New Guinea basin. Consideration of plate kinematics suggests convergence became increasingly oblique during the Cenozoic. We have calculated an average convergence of N6°E at 11.9 cm/year (4.7 in./year) during the Paleocene to Eocene, N60°E at 6.8 cm/year (2.7 in./year) during the Eocene to Miocene, and N60°E at 9.3 cm/year (3.7 in./year) during the Miocene to Holocene. Present-day Australian and Pacific plate vectors indicate predominantly left-lateral strike-slip motion in northern New Guinea.

The sinistral Northern New Guinea fault system defines this zone of plate interaction and represents a suture between continental crust to the south and intermediate crust to the north. The fault system extends more than 3,000 km (1,900 mi) from the Huon Gulf of Papua westward into eastern Indonesia, and is comprised of the Ramu-Markham (Papua) and Sorong (Indonesia) faults. This system is particularly well defined along the Ramu-Markham valley by recent earthquakes of focal depths between 41 and 300 km (25 and 186 mi). First motion studies of these earthquakes indicate both compressional and strike-slip events. Maximum compressive stresses delineated from conjugate shear fractures studied in the field closely agree with the first motion solutions. When combined with the trend analyses of surface fold axes and reflective seismic structural information, these data are consistent with the regional left-lateral deformation of this Tertiary basin.

Hydrocarbon exploration strategies within the Northern New Guinea basin must address not only sedimentation, but also must deal with the basin's complex structural and tectonic evolution. A static tectonic classification will not adequately define the Northern New Guinea basin. It is better described as an evolving basin being overprinted by wrenching.

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Microcomputer Geoscience Software

As an increasing number of geoscientists acquire microcomputers, it becomes evident that most geoscientists do not have time to learn to program or to write programs specific to their professional tasks.

Acting as a worldwide clearing house, GEOWARE solicits descriptions of geoscience software and will publish catalogs of private, commercial, and public domain software descriptions. The catalogs will include the name, address, and phone number of the owner of the software so he may be contacted directly to discuss the software, negotiate for purchase, or arrange for custom programming.

Geoprogrammers are encouraged to contact GEOWARE to receive forms for describing their software.

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Architecture and Production Characteristics of Strand-Plain Reservoir Facies, Matagorda County, Texas

The North Markham–North Bay City field, Matagorda County, Texas, is one of the major multiple-reservoir oil fields of the central Texas Coastal Plain that produce from stacked Frio barrier/strand-plain sandstones. The three principal oil reservoirs in the field are interpreted to be transgressed strand-plain (Carlson), progradational strand-plain (Cornelius), and composite progradational strand-plain/wave-dominated delta (Cayce) systems. Production characteristics of strand-plain facies are modeled using these reservoirs as examples.

Reservoir continuity is greatest in transgressed and progradational strand-plain sandstones where crosscutting channel facies are of minor importance. Hydrocarbon distribution is laterally continuous in both reservoir types. Broad edgewater incursion indicates an absence of internal facies barriers. Progradation of the Cornelius strand plain resulted in a composite reservoir in which the older sands and contained hydrocarbons pinch out against the overlying offlapping sequence.

In contrast, reservoir continuity in the Cayce is poor. Crosscutting fluvial sands produce oil at lower rates, act as conduits for early water influx, and provide facies boundaries against which hydrocarbons in adjacent progradational facies are pooled. Facies changes and pinchouts in heterogeneous reservoirs such as the Cayce are in part responsible for limiting ultimate recovery from major clastic reservoirs along the Texas Gulf Coast to approximately 50 % of the original oil in place.

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Dedolomitization and Calcitization of Gypsum in Mississippian Arroyo Penasco Group, North-Central New Mexico

The Espiritu Santo Formation of the Mississippian Arroyo Penasco Group represents the oldest Paleozoic stratigraphic unit preserved in north-central New Mexico. The Espiritu Santo Formation is a diagenetically complex carbonate unit that exhibits a well-developed cement stratigraphy reflecting changes from meteoric fresh to marine-phreatic environments. Recrystallization of the algal-laminated sediments occurred during subaerial exposure of the overlying Macho Member of the Tererro Formation, a collapse breccia produced by the dissolution and removal of gypsum. The breccia and recrystallized limestone are indicative of broad, low-relief topography and shallow water table.

Cathodoluminescent petrography reveals the presence of pseudomorphs of dolomite and gypsum throughout the Espiritu Santo carbonates. Typical dedolomite morphologies are: inclusion-rich cores surrounded by limpid rims; corroded Mn-rich rhombs within calcite pseudospar; highly zoned rhombs; and uniformly luminescent rhombs enclosed in gypsum pseudomorphs. Calcitized gypsum, occurring as bladed to hexagonal crystals and nodules, varies from highly zoned to uniformly luminescent crystals. The varying luminosity is a possible relict of the original trace-element distribution and/or the diagenetic environment.

Meteoric waters migrating from the Macho Member were enriched, but undersaturated, in dissolved $CaSO_4$ and have low Mg/Ca ratio. Thus these pore fluids within the Espiritu Santo carbonates dissolved gypsum and dolomite. The solution, supersaturated with respect to $CaCO_3$, precipitated calcite. Therefore, the dissolution of gypsum and dolomite and the precipitation of calcite occurred simultaneously during diagenesis. The reaction terminated once the supply of gypsum was exhausted.

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South American Sedimentary Basins

More than 64 sedimentary basins have been identified on the South American continent. According to their regional structural character and tectonic setting, they are classified in 4 super groups.

(1) About 20 interior or intracratonic basins occur on South American cratons (Guayanas, Brazilian, and Patagonian). In most cases, their sedimentary fill is Paleozoic or early Mesozoic. Rift or transverse grabens resulting from incipient sea floor spreading extend towards the continental margin.

(2) 17 basins are located along the Atlantic stable margin, and consist primarily of half grabens with downfaulted seaward blocks. These rifts (or pull-apart basins) were separated as results of the migration of the African and American continental blocks. Therefore the sedimentation is chiefly Cretaceous and Tertiary.

(3) On the western edge of South American cratons, almost 20 basins of downwarped blocks extend from Orinoco down to the Malvinas plateau in a relatively uninterrupted chain of retroarc basins, bordered by the Andean orogen. They lie on a flexured Precambrian and Paleozoic basement, and are highly deformed in the west (Subandean belt) due to the action of compressional forces caused by the tectonic influence of the Mesozoic Andean batholith.

(4) Westward, the Pacific margin is bordered by 27 foreland and forearc basins, which alternate from north to south on an unstable or quasi-stable margin, fringed by a trench and slope complex where the ocean crust is subducted beneath the continental plate.

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Episodic and Cyclic Sedimentation

At the 1982 meeting of the SEPM in Calgary, Robert H. Dott, Jr., of the University of Wisconsin gave a very thought-provoking presidential address on episodic sedimentation. He defined episodic sedimentation as punctuated or discontinuous deposition. He concluded that sediments are deposited episodically and are controlled by such factors as the local storms, floods, and tides. Considered by itself, the concept implies that one basin has no predictable relation to another. Thus, when applying the