biostratigraphy and geomagnetic polarity reversal patterns. The percentage distribution of warm- and cold-water planktonic species in the samples defines a warm late Pliocene (Plaisancian) *Globorotalia inflata* Zone, a cool Calabrian Stage (earliest Pleistocene), a warm Emilian Stage, and a cool Sicilian Stage. Occurrence of *Sphaeroidinella dehiscens* in late Pliocene suggests highest maximum temperature, and dominant left coiling *Globigerina pachyderma* in the Sicilian the lowest.

The paleomagnetic reversal pattern is partly obscured by covered and weathered intervals between the late Pliocene and Calabrian, and within the upper Emilian and Sicilian. The exposed late Pliocene and Calabrian strata show strong normal measured polarities, which suggest that the late Pliocene falls in the Gauss Epoch and that the exposed Calabrian falls either in the late Gauss Epoch or Olduvai event. Recommendations are made for the Committee on Mediterranean Neogene Stratigraphy to core the section continuously, to determine and define precisely the lithostratigraphic and biostratigraphic base of the Calabrian, and to record the complete paleomagnetic history in the type area of the Calabrian, earliest Pleistocene.

Plio-Pleistocene stages of the Mediterranean and Gulf of Mexico are correlated using planktonic foraminifers and climatic implications. The Nebraskan, Aftonian, and Kansan stages correlate with the Calabrian, Emilian, and Sicilian stages, respectively. Paleomagnetic correlations are not entirely clear at this time, except that late Pliocene strata of both regions seemingly fall within the Gauss Epoch.

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STORY OF BIG WELLS

Big Wells field is a rapidly developing oil field in northeastern Dimmit and southeastern Zavala Counties, Texas, approximately 75 mi southwest of San Antonio. Big Wells is a large and significant stratigraphic trap. Production is from a San Miguel sandstone of the upper Taylor Formation (Upper Cretaceous), a section noted for "tight" sandstone conditions and small —5–10 well—oil fields in anticlinal structures generally associated with small volcanic extrusives. This trend has been considered high risk for "economical" fields and therefore ignored by most operators, both large and small. Big Wells has instigated the expected flurry of activity when a "dead" trend suddenly springs back to life.

Ranging from 5,300 to 5,700 ft in depth, with a minimum of 200 ft or possibly 400 ft of oil column, the field was found by Sun Oil in January 1969. Development drilling began in the north part of the field where low-permeability sandstone was encountered casting doubt on the economics involved. Southward of the early drilling, much better sandstone reservoirs were found, resulting in full allowable flowing wells (142 BOPD in March 1971).

The sandstone reservoir is very fine grained, with an average porosity of 18–20% and permeability ranging from less than 1 md to 100 md, generally less than 5 md. The San Miguel sandstone in the Big Wells field area is a linear sandstone body interpreted to have been deposited as an offshore bar.

Today the field is 12 mi long and 3 mi wide. Nine rigs were operating in the field in March 1971. With 160 wells completed by the end of May 1971, the limits of the field are fairly well defined. Drilled on 80-acre spacing, approximately 200–250 wells are anticipated. Production in March 1971 was between 15,000–16,000 b/d of oil.

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STRATIGRAPHY OF *Cibicides carstensi* ZONE, MIOCENE OF LOUISIANA

The fundamental stratigraphic unit of Gulf Coast subsurface geology is the biostratigraphic zone. These zones are named after benthonic Foraminiferida and are widely used in a time-rock sense by most workers in the region. Zonal nomenclature has developed informally within competitive oil companies. The middle Miocene *Cibicides carstensi* Zone has been generally recognized for at least 15 years, but use of the name has been inconsistent, as no type section had been designated. The *C. carstensi* Zone of south-central Louisiana, at its type locality, consists of 4 subzones. Boundaries of the Zone and its components are defined on the basis of Foraminiferida-rich lentils and distinctive electric-log markers.

Percentage of foraminiferal tests per unit volume of sediment provides an index to rate of clastic deposition. Widely spaced lentils containing abundant Foraminiferida in a predominantly clastic sequence record episodes of relatively slow deposition. Abundance and composition of fauna in benthonic communities are controlled, in large part, by depositional rates and nature of substrate. Both of these factors are dependent upon tectonic history in the Gulf Coast. Stratigraphic thickness and sequence are closely related to faulting in this province. Episodes of fault movements can be dated accurately by their influence on depositional thickness and lithologies in equivalent strata on opposite sides of a fault. Stratigraphy, paleontology, and structural history are consequently inseparable. All 3 must be considered simultaneously in any geologic interpretation.

Hydrocarbons of the *C. carstensi* Zone accumulated in blanket sand bodies deposited under conditions of tectonic stability. Sandstones which have a sharp basal contact tend to be erratic and limited in areal distribution. These sands are thought to have been deposited on a steeply inclined or irregular submarine topography during or immediately following spasms of tectonic activity. Such sandstones rarely produce hydrocarbons.

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SEDIMENTS AND DEPOSITIONAL HISTORY OF SOUTHEAST LOBE OF COLORADO RIVER DELTA, TEXAS

Reconstruction of the depositional history of the Colorado River delta's southeast lobe is made possible by combining the delta's documented history, sedimentary and hydraulic principles, past and present depositional environments, and the present distribution of resultant sediment types.

Synthesis of these data makes possible reconstruction of the depositional history as follows.

1. Pre-1929 sedimentation was restricted to the slow accumulation of fine detritus in a reducing environment.

2. Deltation began in 1929, and by 1930 the initial delta lobe extended half-way across Matagorda Bay. Progressively siltier prodelta clays were deposited in the study area. Deposition of generally finer prodelta