times connected) depocenters of the miogeosyncline.

Ely Limestone (Pennsylvanian) exhibits rhythmic arrangement of skeletal to bioclastic, calcarenitic, matrix, and micritic limestones with some interbedded calcareous sandstones. The sedimentary cyclic pattern occurs in stratigraphic sections totaling 1,000 to 1,500 feet, particularly in the Burbank Hills, Confusion Range, and Leppy Range of western Utah, and in the Cherry Creek Mountains, Butte Mountains, Pequop Mountains, Diamond Range, and Pancake Range of Nevada.

Ferguson Mountain Formation (Wolfcampian) of northeastern Nevada and part of adjacent Utah is approximately 2,000 feet of alternating reefoid, bioclastic matrix, and micritic limestones arranged in a remarkable pattern in which this tetrad is repeated numerous times by patterned sedimentation. Farther south in east-central Nevada and west-central Utah the Riepe Spring Limestone and restricted Arcturus Formation (both Wolfcampian) aggregate 1,000 to 2,000 feet of cyclically arranged reefoid, bioclastic-lithoclastic, matrix, and micritic limestones with which occur interbedded calcareous quartzose sandstones.

The Leonardian-age Pequop Formation crops out in a large area of eastern Nevada and western Utah; essentially all sections studied display patterned or rhythmic sedimentation of bioclastic, skeletal, matrix, and micritic limestones. Butte Mountains and Pequop Mountains of Nevada contain finest stratigraphic sections; the one at Moorman Ranch near U.S. Highway 50 about 35 miles northwest of Ely is a remarkable arrangement of about 2,500 feet of criquinites, fusulinid coquinites, sandy matrix limestones, and micrites. A normal triad of criquinites with fusulinids, sandy matrix limestones, and micritic limestones typifies the section in rhythmic succession.

Marine strata of Guadalupian age in western Utah and eastern Nevada include, in ascending order, the Loray Formation, Kaibab Limestone, Plympton Formation, Indian Canyon Formation, and Gerster Formation. The Loray contains shale, siltstone, dolosiltites, evaporitic dolomites, and petroliferous limestones arranged in cyclic manner; this succession evidently formed in marine to non-marine environments under transgressive-regressive conditions. The overlying Kaibab, Plympton, and Indian Canyon do not display marked pattern sedimentation. Gerster Formation normally is less than 1,000 feet thick, but where more than 4,000 feet thick in south-central Elko County, Nevada, it consists of cyclically arranged tetrads of skeletal, matrix, and micritic limestones, and arenaceous criquinites.

Evidence suggests that periodicity of diastrophism of marginal and intra-basin landmasses substantially controlled the pattern of sedimentation in depocenters of the Late Paleozoic miogeosyncline. Marine oscillations and concomitant transgressive-regressive sedimentation across the broad shelves, banks, basin, troughs, and evaporite pans established a pattern of carbonate deposition. Rhythmic activity of the Antler-Sonoma orogenic belt, Northeast Nevada Highland, West-Central Utah Highland, Ely Uplift, and others provided detritus and otherwise initiated and controlled patterned sedimentation.

*BOUMA, ARNOLD H., Scripps Institution of Oceanography, La Jolla, California

SEDIMENTARY FACIES MODEL OF TURBIDITES

Deposits of turbidity currents are characterized by alternating layers of sandstone and shale, in which a unit layer is defined as the sandstone together with its overlying shale.

Studies of turbidites of different ages, and from many different localities in Europe, make it clear that turbidites are characterized by *one* sedimentary facies model, which is composed of five specific intervals in a fixed succession. In a complete layer the intervals from bottom to top are: graded interval (20–500 cm), lower interval of parallel lamination (10–200 cm), interval of current ripple lamination (4–100 cm), upper interval of parallel lamination (2–50 cm), and pelitic interval (1–40 cm).

Each turbidite layer in the areas studied shows part or all of this sequence, and everywhere the succession is the same. The completeness of the sequence generally increases with increase in thickness of the unit layer. Incomplete sequences normally are caused by truncation of the upper intervals or omission of the lower intervals. Large differences in grain size between successive turbidite layers occur where the base of a layer is formed by one of the three lower intervals. The lower bedding planes of such layers are most readily exposed by weathering and are more likely to contain sole markings than layers in which the lower three intervals are missing.

An understanding of the origin of each of the five intervals and the reason for their definite succession in turbidite layers is essential to understand the mechanism of deposition by turbidity currents.

* Permanent address: Geological Institute, Utrecht, The Netherlands.

BROOKE, CLYDE A., Pan American Petroleum Corporation, Houston, Texas
TURNER, PARKER S., Pan American Petroleum Corporation, New Orleans, Louisiana

WEST BASTIAN BAY FIELD, SOUTH LOUISIANA

The large, domal structure at West Bastian Bay field, central Plaquemines Parish, Louisiana, is interpreted as a deep-seated salt dome. A large, east-west striking, south-dipping, contemporaneous normal fault traverses the dome and controls accumulation of oil and gas in multiple upper Miocene sands. At the time of maximum growth along the Bastian Bay fault, sediment was deposited approximately three times as fast in the downthrown block, where most of the hydrocarbon accumulation occurs. The relative thickness of sediments shows that domal uplift, deposition of upper Miocene and younger beds, and movement along Bastian Bay fault were contemporaneous. Reliable electric log correlations together with paleontological data from well samples in the field area, afford excellent data for a detailed study of contemporaneous normal faulting, a type of faulting common to Miocene sediments of the Gulf Coast and important to exploration for oil and gas.

Microfaunal and lithologic data from conventional cores through productive intervals show that the "R" and "S" sands were deposited predominantly in non-marine environments. These sands in turn are separated by dense homogenous gray-black shales, deposited in marine environments equivalent to those existing on the modern continental shelf.

Production has been established in 20 sands ranging in depth from 8,677 to 15,305 feet.

BRAY, ELLIS E., Socony Mobil Oil Company, Field Research Laboratory, Dallas, Texas

PROGRESS IN RESEARCH ON ORIGIN AND MIGRATION OF OIL

Analyses of petroleum and sedimentary hydrocarbons have provided a number of clues to the origin and primary migration of petroleum from source sediments and can reasonably be expected to continue to be a fruitful