

Distinguished Lecture Tour
American Association of Petroleum Geologists

DEPOSITIONAL ANTICLINES OF DEEP ENVIRONMENTS-
PAST SUCCESS AND FUTURE EXPLORATION

ABSTRACT - Mark E. Hennes

As the energy quest probes deeper into the oceanic environment, enormous depositional anticlines formed by deep current action are being documented, and certain of these with favorable rock properties beckon to the explorationist.

Wind-driven surface currents, such as the Gulf Stream, can shape these anticlines at the outer edges of detrital sedimentation where such high-velocity currents sweep the bases of continental slopes. Similarly, the "bottom" currents which are moving at slower velocities deeper on the continental rises will form varied anticlinal profiles characteristic of particular bottom conditions. Redistributed terrigenous materials which in great part compose these anticlines are carried into both current systems by intermittent gravity sliding and turbidity currents.

A striking example of wind-driven current deposition occurs in the Florida Strait where calcareous sands from the Florida reef vicinity are swept along a trough by the Gulf Stream, then onto a broad anticlinal rise. Examples typifying "bottom" current anticlines are numerous in the North Atlantic, and deep-water coring programs have partly revealed their sedimentary sequences.

A wind-driven current origin can plausibly explain the Poza Rica trend in Mexico. As the Golden Lane Reef contributed its Tamabra talus downslope into swift currents of the Chicontepec fore-deep, anticlines were shaped at the base of the slope. Similar origins are suggested for other examples in the geologic record.

Significant reserves in anticlines formed by current action will be found beyond the reefs and laterally away from the deltas in the deep environment where the subtle character of these features must come to be recognized. Reservoirs such as Poza Rica attest to the excellent rock properties and trap conditions which can be realized in an inspired search for such targets.

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Biographical Review



Mark E. Hennes was born in Los Angeles, California on September 24, 1931. He was educated at the University of California at Los Angeles, where he received a B.A. degree in Geology in 1953.

His professional experience includes work on the surface geology of central California with Oceanic Oil Company in 1953 and 1954. He was in military service from 1954 to 1956.

Upon returning to civilian life, Mr. Hennes was employed by the British-American Oil Producing Company in exploration and development assignments on the Gulf Coast and in the Rocky Mountains. He was stationed in New Orleans, Casper, Billings and Denver during the period 1956 to 1966.

He joined Gulf Oil Corporation in New Orleans to work in Gulf Coast exploration from 1966 to 1970.

At present Mr. Hennes is with Core Laboratories, Inc., Geosciences Section, Dallas, where he performs international geologic consulting services.

He is a member of the AAPG, Society of Petroleum Engineers of AIME and the Dallas Geological Society.