

relief are ancestral to tidal channels cut into the underlying Pleistocene sandstone beds.

CHANUT, CLAUDE, CHARLES HUBAULT, and PHILIPPE RICHE, Société Pétrolière Française en Algérie, Algiers, Algeria

OIL AND GAS ACCUMULATIONS IN TIN FOUYE TABANKORT AREA (ALGERIA)

During the past decade several large oil and gas fields have been discovered in the Tin Fouye Tabankort area, which is in the eastern Algerian Sahara Desert approximately 1,000 km southeast of Algiers. The oil and gas accumulations are related to a large Paleozoic north-south trending arch on the southern edge of the Ghadames basin. The hydrocarbons are found in 2 major stratigraphic zones: (1) an uppermost Ordovician sandstone which contains 2 major accumulations, (a) a gas accumulation in the highest part of the arch on the south (ca. 40 billion cu m reserves), and (b) a major oil accumulation extending northward from the gas to the plunging nose of the arch (ca. 150 million cu m reserves); (2) Upper Silurian to Lower Devonian zones in which 4 oil fields have been discovered on northward-plunging noses; the 2 northernmost do not have structural closure on the south (ca. 145 million cu m reserves).

Three petroleum concessions have been granted in the Tin Fouye Tabankort area. SOPEFAL is the operator of the ASCOOP concession. The oil fields in the northern part of the arch have oil-water contacts tilted north to northwest with slopes ranging from 5 to 15 m/km. The Ordovician reservoir is enhanced both in size and petrophysical characteristics as a result of the development of a fluvio-glacial facies related to the last Ordovician ice period.

CHENOWETH, PHILIP A., Consultant, Tulsa, OK 74119

UNCONFORMITY TRAPS

Unconformities occur in three different parts of the depositional environment—on the shelf, the basin-margin coastal plain, and within the basin. Those on the shelf, typified by the Pennsylvanian-Permian of the Mid-Continent, are regional disconformities occurring above and below coal cyclothems. Sand-filled channels are commonly present above these surfaces, and they can form long, narrow, oil and gas traps.

Regional low-angle unconformities characterize the coastal plain as exemplified by the Cretaceous of southern Arkansas and east Texas. They are angular unconformities only from the regional viewpoint, for the structural difference between stratigraphic units is generally less than  $\frac{1}{2}^\circ$ . Porous belts are commonly truncated and overlapped by impermeable layers, producing large-scale stratigraphic traps concealed in a confusing array of overlapping and offlapping sequences.

Erosion occurred at places deep in the depositional basin on relatively local anticlines. Such folds may be part of a mid-basin arch or may simply be local tectonic features. Salt or shale domes and igneous intrusions produce similar effects. Porous formations are sharply truncated by unconformities; locally the difference in dip between units above and below may be as much as  $90^\circ$ . Traps formed under these conditions are narrow and commonly short, but the oil or gas column may be high.

Of the various kinds of traps associated with unconformities, those which form in the area of gentle and repeated tilting and warping on the basin margin are

the largest and most copious. Search for them involves problems in stratigraphy and geometry, but ultimately may prove to be vastly rewarding.

CHUBER, STEWART, Consulting Geologist, Houston, TX 77002

PERMIAN AND EOCENE CLASTIC STRATIGRAPHIC TRAPS IN TEXAS AND LOUISIANA

Stratigraphic traps account for oil production from clastic reservoirs in 4 studied fields of Texas and Louisiana. Three of the traps occur in Eocene beds of the Upper Gulf Coast area; the fourth is in Cisco rocks and formed on the eastern shelf of the Permian basin. Subsurface data were used to delineate typical barrier bars in the 2 Texas fields. In Louisiana the sandstone stratigraphic traps have a delta-distributary channel pattern.

The electric log character of these sandstone reservoirs may be diagnostic of their sedimentary environments.

CLIFTON, B. B., and E. H. FRANKLIN\*, Esso Standard Oil (Australia) Ltd., Sydney, Australia

HALIBUT FIELD, GIPPSLAND BASIN, SOUTHEASTERN AUSTRALIA

Australia's first offshore production, in the Gippsland basin of southeastern Australia, was discovered in 1965. Further exploratory drilling in the area has led to the discovery of additional oil and gas fields.

The Halibut oil field, currently being developed, is considered as a field case history of this Australian offshore operation. The field was discovered, by drilling only 1 exploratory well, in August 1967. It is 40 mi offshore in 238 ft of water and encompasses an area of 11 sq mi. At this early stage, the confidence factor on the seismic interpretation was sufficient to construct a 24-conductor drilling platform.

Oil, associated with a common oil-water contact, is found at the top of the Latrobe complex of Paleocene rocks between depths of 7,400 and 7,856 ft subsea. Stratigraphically the reservoir is composed of braided stream sandstones with some point bar and stream mouth bar sandstones that have been subdivided and mapped as 8 units separated by impermeable breaks. These strata, dipping monoclinally westward, are truncated by a post-Eocene angular unconformity. Closure in excess of 500 ft is provided at the unconformable surface by the combination of erosion and post-Oligocene tilting.

The field is being developed by drilling deviated wells, some in excess of  $45^\circ$  and 6,000 ft from the centrally located platform. With an available maximum of only 24 conductors, optimum drainage points must be selected with care. The number of wells to be drilled to any specific sandstone unit is based on its respective percentage of total reserves. The optimum drainage position is then determined from structure and isopach maps where individual sandstone units are in their highest nontruncated structural position.

COLINVAUX, PAUL A., and DANIEL GOODMAN, Acad. Faculty of Zoology, Ohio State Univ., Columbus, OH 43210

RECENT SILICA GEL FROM SALINE LAKE IN GALAPAGOS ISLANDS

A 4-m drill core of undisturbed sedimentary rock from the crater lake on Isla Genovesa (Tower) has well-defined banding, revealing a complex depositional

\* Senior author