the summer of 1979 a 3-D seismic survey covering 190 km^2 was shot. Interpretation and drilling were simultaneous. Before drilling, probable recoverable reserves were calculated to be 1,600 million bbl. After drilling the estimate was revised to 1,200 million bbl. The field has now been declared commercial and a successful exploration period has been terminated. This discovery has opened new possibilities in an area under active exploration.

BROWN, ALISTAIR R., Geophysical Service Inc., Dallas, TX, C. G. DAHM, Texas Pacific Oil Co. Inc., Dallas, TX, and ROBERT J. GRAEBNER, Geophysical Service Inc., Dallas, TX

Study of Subtle Traps Using Horizontal Seismic Sections

A three-dimensional seismic survey, after proper design, data collection, and data processing, yields a three-dimensionally migrated data volume. Horizontal, or Seiscrop™, sections sliced from this data volume provide a direct horizontal view of the subsurface from which structural interpretation can be straightforward.

In the absence of structure, Seiscrop sections display stratigraphic or paleogeomorphic features directly. However, structural deformation can be removed from the data by flattening. Horizon Seiscrop sections, sliced from the flattened volume, permit stratigraphic and other depositional features to be recognized and studied in detail without the confusion of structure.

Using horizontal seismic sections primarily from the Gulf of Thailand, a variety of small and subtle traps have been identified. These include small fault traps, sand channels, and sandbars. The acoustic nature of these features has been further studied using seismic logs, derived by wave equation inversion. Reservoirs thicker than 30 ft (9 m) have proved mappable.

BROWN, STEPHEN W., and JOAB SALCE, GeoChem Laboratories, Inc., Houston, TX

Surface Detection of Free Hydrocarbon Microseepage from Subsurface Petroleum Accumulation: Case Study

In January 1979, PEMEX began a 2-year test project designed to evaluate the surface detection of free hydrocarbon microseepage as an integrated exploration tool. The tests were performed by analyzing samples collected over fields selected to represent various hydrocarbon entrapment conditions (differing hydrocarbon type, differing trap mechanisms, varying depths, etc). All analyses were performed in the field, and the sample types, sample depths, and collection procedures were varied to determine the best procedures for detecting microseepage anomalies.

In addition to summarizing the various sample collection and analytical procedures utilized in the field operation, results are presented from one of the successful tests conducted over a known producing structure. The analytical field procedures used were C_1-C_7 gas chromatography and $C_{10}+$ spectrum fluorescence analysis of cuttings and core samples collected at varying depths between 2 and 30 m. The structure selected is a lenticular anticline that produces oil from an Austin equivalent at 2,500 m and dry gas from the Jurassic at approximately 3,500 m.

The 350 surface samples definitely indicate that methane is seeping into the near-surface sediments and forming a distinct anomaly directly above the two superimposed reservoirs. Apparently, only the methane is able to migrate through the stratigraphic section, and the heavier components, if they were able to escape from the Cretaceous reservoir, have been stripped and retained by the sediments.

The surface anomaly appears to contain elements of both a circular halo and a centralized anomaly that overlies the apex of the producing structure. The intensity of the anomaly was of a sufficient degree that its detection should have been possible using blind reconnaissance sampling.

BRUNS, TERRY R., PAUL R. CARLSON, and GEORGE PLAFKER, U.S. Geol. Survey, Menlo Park, CA

Structural Deformation in Northern Gulf of Alaska: Transition from Transform to Convergent Plate Motion

Multichannel seismic reflection data reveal the late Cenozoic structure along the continental margin in the northern Gulf of Alaska, where transform motion along the Queen Charlotte-Fairweather fault system gives way to convergent motion along the Aleutian Trench. The active trace of the Fairweather fault system lies generally near the outer shelf and upper slope but, south of Sitka, broad folds and associated faults in late Cenozoic strata seaward of the active trace may indicate additional fault splays beneath the continental slope. The intensity of deformation in these strata decreases to the north, and slope deposits seaward of the Fairweather fault are undeformed between Sitka and Cross Sound. Between Cross Sound and Icy Bay (the Yakutat segment), Eocene and younger shelf strata are relatively undeformed along the continental slope. Late Cenozoic abyssal strata, which partly onlap the continental slope, are relatively undeformed except for local recent deformation seaward of Fairweather Ground. The observed structure along the Yakutat segment of the continental margin is more readily explained by strike-slip motion between the Yakutat segment and the Pacific plate than by oblique subduction of the Pacific plate as deduced from plate tectonic models. Between Icy Bay and Kayak Island (the Yakataga segment), northeast-trending faults and folds that deform Cenozoic strata beneath the shelf and slope suggest relatively continuous late Cenozoic convergence between the Yakataga and Yakutat segments of the continental margin. Thus, the Yakutat segment may have been coupled to the Pacific plate during much of the late Cenozoic.

BUFFLER, R. T., Univ. Texas Marine Science Inst., Galveston, TX, W. SCHLAGER and F. J. SHAUB, et al, Scientific Party, DSDP Leg 77, La Jolla, CA

Results of DSDP Leg 77 in Deep Southeastern Gulf of Mexico—How Good Was our Seismic Stratigraphic Interpretation Ahead of the Drill?

A detailed seismic stratigraphic interpretation of an extensive grid of multifold seismic reflection data provides the basis for a model of the pre-middle Cretaceous sedimentary history of the southeastern Gulf of Mexico. The study area is located in the deep-water part of the western Straits of Florida between the Campeche and Florida Banks north of Cuba. The model predicts that: (1) block-faulted basement topography represents the top of a rifted and attenuated continental (transitional) crust; (2) a syn-rift sedimentary sequence possibly consisting of volcanic and nonmarine rocks of Triassic to Middle Jurassic fills in rift basins and covers the rift topography; (3) a post-rift sedimentary sequence representing a transition upward from shallow- to deep-marine rocks of Late Jurassic