9,000 feet. The oldest Upper Cretaceous rocks are Cenomanian in age (Goudkoff "H" zone), and these lie unconformably on quartz diorite, Sierra-type basement.

Exploration efforts in the initial stages were based on the drilling of what appeared to be structural anomalies. Well control since has indicated that structural closure is a minor contributing factor to gas accumulation. The bulk of the gas accumulation occurs in sand lenses along the flank of a gentle southeasterly plunging nose. Traps primarily are due to lateral and updip disappearance of these sands, and to less degree, to faulting. This lenticularity of sands has resulted in a high dry-hole ratio for normal field development.

C. L. DOYLE, General Petroleum Corporation, Sacramento, California
Santa Fe Pool Development Santa Fe Springs Oil Field, California

Development of the Santa Fe pool was begun with the completion on February 2, 1956, of General Petroleum Corporation's Santa Fe 243 from intervals between 8,050 and 9,010 feet. The initial flow rate was 1187 B/D, 33.3° oil with 844 Mcf/D gas.

The pool underlies the Clark-Hathaway zone, the deepest previously known commercial zone in the field which was discovered and developed between 1928 and 1930. A number of sub-Clark-Hathaway tests have been drilled since 1930. Late discovery of the pool was a result of its small size and the fact that the accumulation is not coincident with the best structural location of the shallower zones.

The Santa Fe pool is of late Miocene age and composed of a series of relatively low-permeability sands with interbedded shales. Total sand in the section is 300–350 feet. Primary control of the accumulation is structural with the crest offset easterly from that of the shallower zones.

The pool has a productive area of about 100 acres. Water is present in members between the producing zones. Gas-bearing members are found at high structural position.

Development of the pool has been rapid, for in spite of its small size, ten operators hold productive land. Well spacing varies from less than an acre to 10 acres. Production practices have been highly competitive, with all sands of the pool open to production.

ARCHER H. WARNE, Richfield Oil Corporation, Bakersfield, California
Structure of Wheeler Ridge Oil Field

Wheeler Ridge is a prominent topographic feature which stands out slightly from the southern margin of the San Joaquin Valley. This ridge is the surface expression of an anticline which contains nine or more oil-producing zones. The structure in all zones is that of an asymmetrical closed anticline, but the series of strata are separated into a hanging wall and a footwall group by a low-angle thrust fault. This thrust fault is nowhere exposed in outcrop, and it was long after discovery of the field that it became a known structural feature.

Maps and cross sections indicate that the movement on this fault was complex, and that, although the hanging wall and footwall anticlines are similar, they are genetically unrelated. Hanging wall structure therefore gave little clue, during early deeper exploration, to axial trends and the whereabouts of structural highs in the footwall block. Both structural blocks contain lesser faults, mainly of the thrust type. One of these is extensive enough to form an intermediate block containing several oil pools.

The Eocene rocks are cut by high-angle faults which cause anomalies in thickness and position of sands, and oil-water contact offsets.

Wheeler Ridge lies within the angle formed by the San Andreas and Garlock faults and is 12 miles north of their point of intersection. Also it lies on the probable extension of the steep buried White Wolf fault. Asymmetry of folds, multiple thrusting, and a component of strike-slip movement are effects to be expected in the area of the San Andreas-Garlock fault systems.

DONALD B. MCINTYRE AND JOHN S. SHELTON, Pomona College, Claremont, California
Preliminary Report on Tectonic History of Vizcaino Peninsula and San Benito Islands, Baja California, Mexico

Under the auspices of the Scripps Institution of Oceanography three visits have been made since April, 1955, to areas on the west coast of Baja California, 300–350 miles south of San Diego. Reconnaissance geologic maps have been prepared of the San Benito Islands and the nearby northwest part of the Vizcaino Peninsula.

Laboratory study of the rocks and fossils is not yet complete, but systematic examination of the areas shows the following.

1. Probably more than 10,000 feet of pre-Miocene chloritic sandstones, grits, and conglomerates occur in two series separated by faulting. A variety of intrusive and extrusive igneous rocks is confined to the older series, and probable Middle Cretaceous ammonites occur sparingly in the younger series.

2. These are unconformably overlain by more than 1,700 feet of highly fossiliferous middle Miocene siltstones, sandstones, and shales, locally of Monterey facies.