monly away from the coast. Absolute age determinations by both Larsen and isotope dilution techniques have confirmed previous regional correlation of the batholith of Baja California with the Southern California batholith.

Relatively undeformed post-batholithic rocks along the Pacific Coast lie across beveled erosion surfaces on both pre-batholithic and plutonic rocks, clearly establishing the age relations. Abundant fossils indicate that the oldest exposed sediments in this sequence are of Maestrichtian age.

A close point of correlation has been established between the relative and absolute time scales. The absolute age of the intrusive rocks, $115(\pm 10)\times 10^6$ years, falls in the interval of time bracketed by the Albian below and the Maestrichtian above. The chronological and geological relations of the Baja California rocks to those of adjacent regions are considered.

DONALD A. HENDRICKSEN, Richfield Oil Corporation, Ojai, California

Fillmore Oil Field, Ventura County, California

The Fillmore field is a relatively minor Ventura basin oil field located west of and adjacent to the city of Fillmore. It is one of several recent discoveries in the Santa Clara Valley area between the Oak Ridge fault on the south and the San Cayetano fault on the north.

The Fillmore field is an excellent example of multiple-zone primary stratigraphic trap accumulation, independent of local structural closure. Two middle Pico (Pliocene) sand zones have produced to date. Closure in both zones is effected by rather abrupt updip pinch-out on a low southeastward-dipping homocline.

The Spalding pool was discovered by Standard Oil Company in April, 1954, and development of the field has been continuous and orderly since then. The Perkins pool, slightly shallower but more limited in areal extent, was discovered by Humble Oil and Refining Company in January, 1957. Both zones have short oil columns, small free gas caps, level water tables, and relatively narrow productive areas elongate essentially parallel with the regional northeasterly strike.

At present the field is 3 miles long and has maximum width of 3,200 feet, with a proved productive area of approximately 800 acres. Average well depth is a little more than 14,000 feet, and gravity of the oil is 27°–35° API. Cumulative production to August 1, 1957, was 2,387,000 barrels, and average production as of that date was 7,984 B/D from 22 wells.

The productive limits of the two known pools have been fairly well established except at the east end of the field, where development is continuing at present. Future expansion of the field depends on its easterly extent and possible discovery of additional Pliocene sand pinch-out traps.

TOD P. HARDING, Humble Oil and Refining Company, Chico, California

Llano Seco and Perkins Lake Gas Fields, Butte and Tehama Counties, California

The Perkins Lake and Llano Seco gas fields are in the north point of the Sacramento Valley 12 and 16 miles, respectively, southwest of the city of Chico.

The Llano Seco field was discovered in November, 1954. Production is from the Upper Cretaceous Estes and Sannar sands at a depth of approximately 3,300 feet. Structurally, the field is on a broad, symmetrical north-trending anticline.

The larger Perkins Lake field, discovered in September, 1955, produces from the lower Eocene "Perkins Lake" sand at depths ranging from 3,365 to 3,505 feet. The structure is an elongate, northeast-trending anticline.

Stratigraphically, the two fields are quite dissimilar. The Llano Seco field has an almost normal sequence of lower Eocene and Upper Cretaceous beds, whereas the Perkins Lake field, being in an Eocene erosional gorge, has a lower Eocene section which is greatly thickened at the expense of the Upper Cretaceous section. The pronounced unconformity at the base of the Eocene is found 1,300–1,800 feet lower at Perkins Lake than at Llano Seco, whereas within the Cretaceous the two fields are nearly flat structurally.

HAROLD L. FOTHERGILL, Union Oil Company, Orcutt, California

Oil Creek Field, San Mateo County, California

The Oil Creek field is in the southeast corner of San Mateo County, in the Santa Cruz Mountains. The discovery well was the Union-Richfield's Costa No. 1, completed in October, 1955, from the interval 2,055–2,206 feet, with production from the Butano sandstone of Eocene age. The initial production on the pump was 100 B/D, 10% cut, 43.2°, 45 MCF. As of September 1, 1957, the well had produced an approximate total of 25,775 barrels net oil and has a present daily rate of 30 barrels net oil.

The surface structure is anticlinal and was delineated in the field by close coordination of surface mapping and paleontological control. The subsurface structure is that of a faulted anticline or a bowing against a fault.

The stratigraphic section in the field consists of the San Lorenzo and Butano formations.

Five wells have been drilled in the field with only the discovery well a commercial well. The second well encountered a major fault and stopped in the down-thrown side, the third and fourth wells were high and in the gas cap, and the fifth well was low and wet.

Exploration is difficult, not only because of the complex structural conditions, but surface exposures are limited by the thick growth of forests and underbrush. Many geologists believe that there is a commercial oil field in the vicinity.

PETER H. GARDETT, consulting geologist, Los Angeles, California

Geology and Related Developments in Part of the City of Los Angeles

Geologic conditions within the confines of a municipality continually manifest themselves as problems or as assets to the residents, the landowners, the industries, businessmen, and the city management.

During the past and present years the people of the City of Los Angeles have been and are affected by the geologic setting of their city. Some of the problems related to these geologic features appear only after a natural set of conditions has been altered by the projects of a growing city and her people. Other problems occur as geologic stresses tend to equalize in this area of changing tectonics. Still other situations arise when an effort is made to develop natural resources postulated to exist within a metropolitan area.

A part of the Los Angeles basin, located principally within the City of Los Angeles, and comprising an east-west-trending strip between the Los Angeles River and the Pacific Palisades is reviewed. Geologic conditions known in this area are discussed relative to building-site problems and to potential oil development. A review of recent efforts, on the part of the city management, to direct such developments to the best interests of the people is presented.

WILLIAM D. LEWIS, Lewis and Ganong, Bakersfield, California

Racetrack Hill Anticlinal Trend, Kern County, California

The Racetrack Hill anticlinal trend, approximately 7 miles east of Bakersfield, Kern County, consists of an area 10 miles long and one mile wide. On it are three oil fields of moderate economic importance—Racetrack Hill, Graham, and Jeppi—that have produced approximately 10,000,000 barrels of high-gravity oil from lower Miocene sands.

The Racetrack Hill anticlinal trend plunges approximately 500 feet per mile southwest which is almost perpendicular to the main structural trends in this part of California. It can be traced in the lower Miocene sediments as far as North Mountain View. Seismic data suggest that it probably extends southwest. The anticlinal structure, limited in general to the lower Miocene sediments, upward becomes less pronounced, and, in one place is displaced by a broad syncline in the younger sediments. Production along it is caused by actual domal closure in the Racetrack Hill oil field. Graham and Jeppi have been caused by cross-faulting in conjunction with nosing. This structure is bounded on the east by a major, possibly pre-middle Miocene fault having maximum vertical displacement of 2,000 feet.

The lower Miocene in this area is represented by a series of sediments ranging in thickness from 1,500 feet at outcrop to at least 4,000 feet in the vicinity of the North Mountain View area. The Nozu in this area reaches a maximum thickness of more than 400 feet in the Graham area where it consists mostly of a series of very coarse conglomerates. The underlying Freeman is a dark brownish gray siltstone. Beneath this the lower Miocene productive zones occur—the Jewett consisting of a series of siltstones and permeable sands having maximum thickness of 250 feet, the Pyramid Hill sand, a 20-foot ash bed beneath this characterized by a basal grit believed to be the base of the Saucesian stage, and the underlying probably Zemorrian stage sediments that are referred to as Vedder except where they grade into the non-marine Walker series. The Walker is non-productive.

KENNETH F. KRAMMES, Intex Oil Company, Bakersfield, California

Stratigraphic Sections and Stratigraphy of San Joaquin Valley, California

The South San Joaquin Valley section begins on the west side of the San Andreas fault where the strata consist of about 4,500 feet of continental beds, from Paso Robles through Simmler, resting on a granite Basement Complex. East of the San Andreas fault, the structurally complex Temblor Range has a thick marine section from upper Miocene through the Eocene and probably part of the Upper Cretaceous, although no wells have penetrated the latter. Eastward from the Belgian anticline, the wedge of marine Pliocene thickens into the central basin. On the eastside, the Pliocene becomes entirely continental. The Miocene also thickens basinward but with the exception of the top and bottom generally maintains its marine character eastward. The Oligocene is a thin sliver which is overlapped westward and lost in the general eastward sand and continental facies. Greatest penetration of the upper Eocene has been at Belgian anticline. On the eastside, the upper Eocene rests unconformably on the Jurassic Basement Complex; and along the east border, it becomes thin and continental and inseparable from the lower Miocene, Walker.