been thought by the writer to be a clue to the existence of a system of closely spaced lateral fault traversing the area in a northwest direction. The remarkable broad parallelism of these surface features, together with their highly interrupted aspect and their commonly looped shapes, has led to much speculation regarding their significance and manner of origin. Although no positive relationship can be established, it has long been assumed that the steep horizontally slickensided fractures cored in widely scattered deep wells in this area, were of the same trend and system as the surface lines.

The initial earthquake of July 21, 1952, produced in the Bakersfield-Arvin area some surface features which are so favorably comparable with the older series of lines that there can be little doubt regarding their identical manner of origin. It is believed that during most of the Cenozoic there has been a recurrence of slight shifts on an ancient system of basement faults, with individual adjustments reflected at the ground surface as oriented shallow sloughs and lateral offsets.

MASON L. HILL, Richfield Oil Corp., Los Angeles

Lateral Faults of Southern California

The northwest-trending San Andreas is the principal right-lateral fault of the region, and there are probably a dozen important others. The Big Pine-Garlock northeast-trending fault is the principal left-lateral fault of the region, and there are probably a half dozen important others.

An accumulation of many miles of strike-slip on these faults is likely. The juxtaposition of dissimilar rock sections may be explained by such movements. If so, the generally accepted histories of vertical displacement are doubtful, as are numerous interpretive geologic maps.

These faults comprise strain systems of north-south shortening. Northeast-southwest counterclockwise compression, perhaps due to subcrustal flowage from the Pacific, may be responsible for the lateral faults and other structures of the region.

Much more work is required before the ages and displacements of the lateral faults can be determined. Such work necessitates approaches which are now seldom used. Until this is at least partly accomplished there is apt to remain a critical hiatus in our knowledge of the geologic history of California.

ROBERT L. JOHNSTON, Western Gulf Oil Co., Bakersfield

Production Variations Resulting from Recent Earthquakes in Bakersfield Area, Kern County, California

The Arvin-Tehachapi earthquake of July 21, 1952, caused a decided change in the daily production of several oil fields in the San Joaquin Valley. The fields exhibiting the most noticeable effects of the earthquake were Tejon Ranch, Kern River, and Fruitvale. In general, production variations consisted of a sharp rise in casing pressure, accompanied by a slight decline in daily production of oil and water, Nearly all the affected wells had returned to normal production within a period of 2–3 weeks. It is significant to note that these fields produce from relatively shallow and unconsolidated formations. No evidence of actual fault movement was detected in any of the wells although a number of casing failures at shallow depths were reported in the Tejon Ranch area. Fire resulting from the earthquake caused approximately 2 million dollars worth of damage to the Paloma Unit cycling plant operated by the Western Gulf Oil Company.

ROBERT F. HERRON, M.J.M. & M. Oil Co., Fillmore

Thrust Faults of Ventura Basin.

When examining the over-all picture of the Ventura basin, one is impressed by the number of large thrust faults which occur. These east-west faults are among the most predominant structural features of the area. Much of the present topography is controlled by these faults. There is good evidence that much of the movement of these faults occurred during the Pleistocene and some of them may have been active as late as that period of chronological confusion when the Pleistocene ended and the Recent began. In several places a north-dipping fault overrides a south-dipping fault, indicating that there were probably two periods of faulting. The displacement of these faults varies from that of a few hundred feet to as much as 20,000 feet. If known rates of movement now occurring in Southern California are applied to these faults, it is possible to postulate that more than 600,000 years were required for the displacement to have taken place on some of the larger faults.

Many of the Ventura basin oil fields are closely associated with these thrust faults. The four predominant relationships are as follows.

1. Anticlinal accumulation on the upper plate. The Oak Ridge oil fields are examples.
2. Accumulation on the upper plate against the fault such as in the Ramona field.
3. Oil zones are repeated. This occurs in the Oak Canyon field.
4. Subfault accumulations such as in the Timber Canyon and Ojai fields.

In conclusion it is suggested that further exploration along these fault trends will discover more oil.