

nel," delayed definition of the West Thornton gas field for four years until further development drilling was undertaken in April of this year. Since this time five additional wells have been completed in the Midland pool.

S. R. SILVERMAN, California Research Corporation

Critical Review of Contemporary Theories of Petroleum Origin

The present status of chemical, geological, and biological information on the origin of petroleum strongly favors the theory of organic (or biogenic origin over that of inorganic origin. There is no general agreement, however, on the mechanism or mechanisms by which biologic products become petroleum. Among the various hypotheses offered to explain this conversion, two have received most attention and occupy the forefront of present-day theories of petroleum origin. One, which may be designated as the "Direct-Accumulation" hypothesis, contends that petroleum consists of a selective accumulation of relatively unchanged organic compounds produced by living organisms. Opposed to this explanation are the so-called "Transformationists" who believe that biologic source materials must undergo marked chemical transformations, under the influences of temperature, pressure, and lithologic environment, before they are converted into petroleum. A critical review of available chemical and geologic information on petroleum and other organic materials in ancient and modern sediments suggests that chemical transformations play an important role in petroleum formation.

JOHN W. GROESCH, Union Oil Company of California
Economics of Marketing

The Pacific Coast market today is highly competitive. Price wars have been with us so long that depressed prices seem normal. Marketing margins are low. Refiners margins are seriously depressed. Eastern oil companies are seeking Pacific Coast outlets for their product. This contrasts with the stable Pacific Coast market of 10 years ago.

The turning point came at about the time of the Korean War. With the big Middle East oil strikes, productive capacity exceeded consumption. Combined with a surplus of tankers, a shift from production orientation to marketing was inevitable. Concurrently, petroleum companies have been seeking greater efficiency in all phases of their operation.

For the next 20 years, California continues to have the greatest growth prospects in our market. Following 1980, a similar expansion is expected for the Pacific Northwest. Marketing prospects are virtually unlimited.

RICHARD R. THORUP, consulting geologist

King City Oil Field, Monterey County, California

The King City oil field, also referred to as the San Bernabe oil field, is 20 miles northwest of the San Ardo oil field, and 6 miles south of the town of King City, Monterey County, California. The field was discovered in December, 1959, the discovery well being the Thomas Doud Estate No. 2, which produced 16° gravity oil at the rate of 76 b/d net oil cutting 16% from a depth of 2,000 feet. The No. 3 was also completed in December, 1959, with an I.P. of 531 b/d cutting 0.1%. The No. 4 was completed in June, 1960, as a gas well indicating the possibility of a gas cap in the field. Cumulative production through September, 1960, is 43,000 bbls. of net

oil and 10,000 bbls. of water. The producing sand is middle Miocene in age with a total thickness of 330 feet, about 150 feet of which is oil saturated. Porosity averages 23% and permeabilities have been found as high as 2,100 millidarcys. Accumulation is believed to be due to a combination of structure and stratigraphy. The discovery well was located primarily on the basis of field and subsurface geology.

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Interplanetary Correlation of Geologic Time

Asteroid impact has produced a significant number of medium and large craters on the earth in comparatively recent geologic time, and the rate of impact can be interpreted to have remained fairly steady for at least the last half-billion years. By extrapolation of this rate, the age of major stratigraphic units on the moon may be estimated from the number and distribution of superimposed primary impact craters. With appropriate modification, the same principle should be applicable to Mars when detailed photographs become available for photogeologic mapping.

A second potential method of interplanetary correlation depends on the actual transport of impact debris from other planets to the earth, where the debris becomes incorporated in the terrestrial stratigraphic record. Some rock debris is ejected at escape velocity by asteroid impact on the Moon and probably also on Mars; part of the lunar ejecta must land on earth and a very small fraction of Martian ejecta is probably also swept up by Earth. Some tektites are probably formed by ablation of ejects thrown into orbit around the earth. It may be possible to identify the craters from which ejecta are derived at some advanced stage of lunar and planetary exploration and thus tie the age of these craters directly to the terrestrial time scale. A ray crater in the size range from Aristarchus to Tycho is the probable source of the ejecta from which the australites and associated Pleistocene tektites were formed.

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Trends in Geological Society Membership in Oil Industry of California

Membership in the Pacific Section of the American Association of Petroleum Geologists has declined 18.8% from its all-time high of 1,362 members in 1956. The rate of decline appears to have leveled off during the year 1959-60. During the 15 years prior to 1956, the Pacific Section grew rapidly from 247 members in 1941. This rate of growth was at least equal to the phenomenal growth rate experienced by national A.A.P.G. The present analysis shows the trends of Pacific Section membership throughout California during the 9-year period 1951-1960. Trends by areas corresponding with those of local geological societies and oil-company operations are shown. Statistics used are obtained from membership lists, newsletter mailing lists, and five Pacific Section directories published to date.

By the use of these statistics, it is possible to show that while the number of members has changed, the percentage distribution of Pacific Section members in each of the Los Angeles, San Joaquin Valley, Coastal, and Northern California operational areas over the past 9 years has remained fairly constant, but that members outside of California have increased from 4% to about 15% of the total organization. A study of the percentage distribution of members by organizational affiliation shows that between 40 and 50% of the members worked