

About 44,000 cubic miles of unaltered sediments, ranging in age from Lower Cretaceous to Pliocene, occupy the basin. Of this volume, three-quarters is marine Cretaceous, and the remainder is marine Eocene covered by a veneer of non-marine Miocene and Pliocene rocks.

More than 300 exploratory wells have been drilled in the province, resulting in the discovery of 28 commercial gas pools, from which more than $1\frac{1}{4}$ billion M.c.f. of gas had been produced by December 31, 1949. The average explored density is 38 square miles per exploratory well with the greater concentration in the southern part.

Producing zones range in age from Pliocene to Upper Cretaceous. Eocene sediments have furnished the major part of the production. Anticlinal closures are the predominant type of discovered trap with minor accumulations due to fault closures and stratigraphic discontinuities.

Oil seeps in the outcrop and oil showings in Lower Cretaceous sediments in shallow wells in the western part of the province suggest the possibility of undiscovered oil reserves. Additional gas reserves, resulting from deeper and more intensive drilling are a distinct possibility.

The variable distribution of formations and sand facies within the basin, together with the regional eastward overlap of Middle and Lower Cretaceous sediments, suggests that some type of stratigraphic trap may be instrumental in the accumulation of the major part of the discoverable reserves in this province.

6. SAN JOAQUIN VALLEY

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The San Joaquin Valley sedimentary basin is approximately 250 miles long and averages 50 miles in width, comprising an area of 14,100 square miles. Maximum depth to basement is close to 35,000 feet. Volume of sediments is estimated at 31,000 cubic miles of which about 85 per cent is marine.

Acreage productive of oil and gas amounts to 360 square miles, 2.62 per cent of the sedimentary area. There were 23,768 wells drilled of which 3,106 have been dry holes and 92 oil fields and 14 gas fields have been discovered.

Future fields will probably be found primarily in traps where the stratigraphic element is predominant, although there are very likely a number of undiscovered fault traps and perhaps a few closed anticlines that have escaped detection.

Deep prospects are better on the west side of the valley as numerous east-side wildcats have been drilled to basement in contrast to very few on the west side. The lower Miocene and older beds on the west side are probably devoid of oil and gas showings at great depths due to low-grade metamorphism.

7. CENTRAL COAST RANGES

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In this arbitrary division are situated the Cuyama Valley, Carrizo Plain, Salinas Valley, San Andreas trough, Halfmoon Bay-Santa Cruz area, and the Livermore-Contra Costa basin.

Combined area of these basins is 4,500 square miles with an estimated volume of sediments of 6,500 cubic miles. Seventy-five per cent of the sediments are believed to be marine.

Commercial oil production was not discovered until 1948. There are now four substantial producing fields in the Cuyama Valley and two in the Salinas Valley. There were 377 exploratory wells drilled to December 31, 1949.

The complex structure and stratigraphy of these basins make them difficult to prospect and many more wildcats will have to be drilled to explore thoroughly the oil and gas possibilities.

8. SANTA MARIA REGION

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The Santa Maria province is a roughly triangular area in the California coastal belt which is bounded on the west by the Pacific Ocean, on the south by the Santa Ynez Mountains, and on the north and northeast by the Santa Lucia Range. The province consists of several more or less isolated structural basins with similar sedimentary histories and related types of objective zones and traps.

Many types of rocks underlie the zones of present and prospective production. The term, basement, as used in this paper, refers to rocks older than Eocene that consist of Jurassic metamorphics and basic intrusives and Cretaceous and Jurassic sediments that have undergone various degrees of alteration.

The Santa Maria province has an area of 2,126 square miles, of which 1,824 square miles are underlain by objective sediments. The volume of unaltered sediments is estimated at 1,112 cubic miles and the maximum depth to basement rocks is approximately 16,000 feet.

About 400 exploratory wells have been drilled in the province, resulting in the discovery of 14 productive areas with a cumulative production to December 31, 1949, of slightly more than 300 million barrels of oil.

Production is largely from Miocene sands, shales, and cherts. Significant amounts of oil have been produced from lower Pliocene sands and in one area from fractured sandstones of Jurassic age. This Jurassic production is considered to have migrated from overlapping Miocene beds.