

least 2,000 feet of poorly bedded sandstone, unconformably overlies the Oligocene and Eocene strata in the South Slough syncline and has been folded along the same axis to a lesser degree than older formations. Pleistocene terrace and estuarine deposits cover the coastal plains and major valley bottoms.

Coal was first mined in 1854, and production reached 100,000 tons a year during the early part of the century, but since the increased use of fuel oil during the twenties coal has been mined only for local needs. The total production for the field is probably of the order of 3 million tons.

The Beaver Hill bed, lowest coal of the upper group, has been mined more extensively than any other bed; with a few exceptions other beds of the upper and lower groups have not yielded great tonnages; these beds are ordinarily higher in ash and contain more numerous partings.

Detailed mapping and drilling on four properties have resulted in developing 541,000 tons of measured coal; an additional 800,000 tons was indicated and 3,200,000 tons was inferred. More than 160 mines, prospects, and outcrops were examined and are described; 60 of them were sectioned and sampled. Coos Bay coal is subbituminous in rank, with a heating value of 9,000 to 10,000 B.t.u. per pound as received, with a low sulphur content, moderate percentage of ash, and a relatively high moisture content. The coals of the lower group have a higher heating value and a higher ash content, but mining conditions are relatively unfavorable.

MORTIMER KLINE, Oil for the Lamps of America

The author was recently general counsel for the Petroleum Reserves Corporation at Washington, D. C. He discussed the future of the development of the great oil reserves of the Middle East, emphasizing the importance of American participation and outlining the efforts of the Government to improve the position of American interests. He considered the acquisition of the early concessions, described their present control and the great potentialities of the region, and pointed out the need for more global thinking on the part of most American geologists.

JOHN C. HAZZARD, Some Features of Santa Susana Thrust, Vicinity of Aliso Canyon Field, Los Angeles County, California

This paper discusses a 6 mile segment of the Santa Susana thrust, a feature in which the northern block is thrust southward for 18 miles along the southern side of the Santa Susana Mountains. In part the surface trace of the thrust is relatively straight but in canyons such as Mormon and Brown's Canyons it is extremely lobate, due to deep dissection of its relatively flat part. Likewise in Aliso Canyon the fault is exposed in a small fenster. Features of the overthrust sheet include large scale folding and fault imbrication as well as several transcurrent or tear faults along which there has been both vertical and horizontal displacement.

Studies based on outcrops of the thrust plane and subsurface data indicate that in transverse cross-section the structure has the form of a crude inverted "L." The short segment varies from gently north-dipping to slightly south-dipping. There the thrust plane is smoothly irregular with culminations or structural highs developed in Aliso, Mormon, and Brown's canyons. The long segment of the "L" is steeply north dipping and well data show that this segment maintains its near-vertical character to at least 6,900 feet subsea. A hypothetical northward flattening at an undetermined depth is suggested.

An extensive shear zone, developed below the main plane of movement, is considered a portion of the static block. This zone includes material from all of the stratigraphic units recognized below the thrust. A minimum estimate of 8,000 feet is made for the north to south displacement; the vertical displacement appears to be close to the same amount.

Evidence suggests that during its development, the thrust reached the surface as a steep fault; with additional movement, the fault followed roughly the erosion surface and its flatter segment was developed. The latest period of movement was probably Pleistocene, for terrace deposits considered to be of that age are overridden by the thrust. Many problems connected with the fault await solution, chief among them being the explanation of the major differences between the stratigraphic sections within the overthrust and static blocks.

ALBERT GREGERSEN, *Exploratory Activity and Oil and Gas Discoveries in California for First Nine Months of 1944*

The number of wildcat discoveries in this period are very impressive. The amount of oil discovered is depressive. Gas discoveries have been of major importance. Results are compared with 1943. Twenty-four new oil fields and six new gas fields have been discovered. Most important oil fields are Jacalitos Northwest, and Sheep Springs. Commercial oil discoveries are discussed. All six gas discoveries are commercial. These are described.

Thirty-one new pool discoveries and extensions have added at least six to eight times as much to our reserves of oil as the wildcat discoveries. By far the most important new pool discovery is the "27-B" sand in the Buena Vista field, Kern County, where as much as 40 million barrels of reserves may have been proved by drilling to date. Another important deeper zone discovery, the lower Grubb of Pliocene age, was made in the San Miguelito field, Ventura County. A deeper zone discovery in the Rio Vista gas field, the Perry Anderson sand in the Eocene, is of major importance.

Exploratory drilling is up 30 per cent over 1943. Depth of exploratory holes has increased. Geological exploration, surface and subsurface, was responsible for 19 out of 30 wildcat discoveries. Seismograph mapping accounted for eight discoveries.

Success percentage of exploratory holes and footage drilled was up about 5 per cent over 1943. There was a decrease from last year in the success percentage of wildcats drilled on subsurface geology and seismograph surveys.

Nineteen forty-four will be a record year for exploratory drilling activity. The average reserves per oil field discovery will be an all-time low. A world's record for deep drilling has been established.

Results of wildcatting suggest that we are fishing in streams largely fished out. New preserves, such as the State tidelands, may be opened by law. Others, such as Tertiary Marine Basin of the Pacific Northwest, may be opened by adventurous Izak Waltons. Persistent and expert fishermen will continue to catch a few "big ones" for some time to come.

L. A. TARBET AND W. H. HOLMAN, *Stratigraphy and Micropaleontology of the West Side of Imperial Valley, California*

Imperial Valley is the southern part of a large northwesterly trending valley in southeastern California. This valley is a part of a large basin of deposition which existed during parts of Tertiary and Quaternary time. The stratigraphy discussed in this paper is based on a study of the exposed Tertiary and Quaternary sediments in the region bounded by the Santa Rosa Mountains on the north, Salton Sea on the east, Mexico on the south, and the crystalline rocks of the Coast Range on the west.

The rocks exposed in this region may be divided as follows:

Basement complex. Granite and metamorphic rocks

Split Mountain formation—0 to 2,700 feet. Non-marine fanglomerates and sandstones intercalated with marine sandstones and shales unconformably overlying basement complex. Miocene?

Alverson Canyon formation—0 to 700 feet. Non-marine unsorted sediments and associated basic igneous flows and tuffaceous sediments unconformably overlying all older rocks. Unfossiliferous