

ABSTRACTS

Sea Floor off Southern California, by K. O. EMERY, University of Southern California, Los Angeles.

The sea floor off southern California is unlike that adjoining most other coasts of the world in its great topographic irregularity. The area of about 30,000 square miles consists of a checkerboard-like pattern of basins and ranges which are believed to be grabens and horsts that were formed in late and post-Miocene time. A general southward decrease in elevation of the tops of the ranges and the bottoms and sills of basins suggests that regional tilting followed or accompanied the local faulting. Basins far from shore are only slightly filled with sediments, those near shore have been nearly completely filled, and the Los Angeles and Ventura basins have been filled to overflowing so that they now are land areas rather than part of the sea floor. Grain-size, calcium carbonate, and organic content of the sediments present a smooth graduation from the Los Angeles basin through the near-shore basins to the offshore basins.

Matching Land and Sea Floor Topography and Structures off California, by HENRY W. MENARD, Navy Electronics Laboratory, San Diego.

Recently discovered seascarp, and mountain ranges on the deep sea floor off California have a pattern which is closely related to the pattern of topography and structure on land, and may help to fill in missing elements in the land pattern. The sea floor for more than a thousand miles west of California is fractured along two narrow parallel zones which intersect the coastline near Cape Mendocino and Point Conception with an easterly trend. The zones of fracturing can be interpreted as shear zones complementary to the San Andreas fault. The southern band of fracturing has the same trend and position as the Channel Islands and the Transverse Ranges. The band of earthquakes which trends out to sea northwest from Cape Mendocino lies along a submerged continuation of the Coast Ranges separated from the continental slope by a vast trough. The topography of the sea floor off the northwestern United States, therefore, is roughly a mirror image of the Baja California Peninsula and the Gulf of California.

Review of Pacific Coast Off-Shore Seismic Methods, by CARL H. SAVIT, Western Geophysical Company.

Discussion of instruments, techniques, and equipment currently in use for Pacific Coast offshore operations. Many phases of the operation illustrated by color slides.

Recent Developments in Submarine Coring, by W. W. RAND, Submarex.

The taking of submarine oriented cores for use in oil exploration has progressed steadily since 1947, and there are now six vessels engaged in this work on the Pacific Coast. Early coring methods employed divers to assist with the handling of the equipment, but since 1948 a great many oriented cores have been taken without the help of divers in an area extending from Eureka to the Mexican border. Some of the equipment used in this work is briefly described, and some of the operations are shown in colored slides.

National Affairs of the Association, by EDWARD A. KOESTER, President of A.A.P.G., Consultant, Wichita, Kansas.

Single-Boat Marine Seismic Surveying, by NEIL W. MANN, Geophysical Service Inc.

Because of its unique operational problems, offshore exploration during the past few years has



FIG. 1.—Left to right: EDWARD A. KOESTER, A.A.P.G. president, Wichita, Kansas; PAUL L. LYONS, president, Society of Exploration Geophysicists, Tulsa, Oklahoma; G. M. KNEBEL, general chairman, A.A.P.G.-S.E.P.M.-S.E.G. annual meeting, New York City, March 28-31.



FIG. 2.—Left to right: RUSSELL R. SIMONSON, Ohio Oil Company, Los Angeles; EDWARD A. KOESTER, A.A.P.G. president; E. HAROLD RADER, outgoing president, Pacific Section, A.A.P.G.; GRAHAM B. MOODY, vice-president, A.A.P.G., Berkeley, California.

been the object of much publicity and interest. This paper describes the "single-boat" method of marine seismic surveying as it is conducted by GSI. The single-boat method of marine seismic surveying has been used successfully to explore in many areas where it would be difficult to explore with conventional methods. The application of this method to the California offshore area would require certain changes in the present system and the addition of another boat. However, such changes appear to be entirely feasible within present economic considerations.

Geological Diving, by ROBERT F. DILL, Geological Diving Consultants, San Diego.

Geological diving, one of the newest forms of offshore exploration, is being used successfully in the search for offshore oil. It is now possible for properly trained geologists to map the sea floor to depths of 150 feet, thereby opening approximately 1,000 square miles of ocean bottom for inspection off southern California alone. At present more than 1,500 dives have been made for the specific purpose of obtaining geological data.

Geological diving is particularly suited for, but by no means limited to, that zone which extends from the shore line to approximately $\frac{1}{2}$ mile offshore. It is here that the land geologist is stopped by surf, and seismic operations by law.

To explain better the problems and techniques used by the underwater geologist a short motion picture of a typical diving day is presented.

Gravity-Meter Exploration in Marine Seas, by EUGENE FROWE, Robert H. Ray Company.

This paper describes methods of conducting gravity-meter surveys in water-covered areas such as bays, lakes, and oceans. Types of boats, gravity meters, surveying techniques, cost per station, reliability of results, and problems are discussed. Typical gravity-meter anomalies encountered in Gulf of Mexico are shown.

Drilling Platforms and Islands, by D. S. HARE, Monterey Oil Company.

Experience in the construction of various types of drilling platforms and islands used in offshore drilling on the Gulf Coast is discussed and compared with the recent experience of the Monterey Oil Company in construction of a permanent island for the drilling of its discovery well, State No. 3. The cost of these two techniques is compared and the effect of these expensive operations on marine exploration is discussed. Films of island construction are presented.

California's Submerged Lands, Past, Present, and Future, by FRANK HORTIG, Mineral Resources Engineer, California State Lands Commission.

A general historical review is presented of coastal tide and submerged land development, including first tideland well in 1896 and first offshore drilling platform in 1932.

Past production, locations, and techniques have resulted in 248,000,000 barrels production and \$85,000,000 lease royalty to the State through 1953. Current production and royalty, January through June, 1954, are described.

Present problems are summarized. The magnitude of future operations is estimated. Possible techniques for development are suggested.

Wildcat Round Table, by J. F. CURRAN, Honolulu Oil Corporation, J. D. FRICK, Humble Oil and Refining Company, R. L. HESTER, Signal Oil and Gas Company, and J. M. SAUNDERS, Tide Water Associated Oil Company.