5. The Activity of Paricutin Volcano,* Ray E. Wilcox, United States Geological Survey.

During the 5½ years since its birth Paricutin Volcano has been constantly active, with lava issuing at a remarkably uniform rate and ash and bombs somewhat less uniformly. In the first two years the dense ash eruptions destroyed many thousands of acres of crops, pastures, and forests in the area near the volcano, while ash-laden flood waters caused damage well outside the immediate area. During the past three years the less continuous ash eruptions have permitted a limited agricultural and biological recovery in the marginal zones, although some processes, such as erosion, continue almost unchecked.

The current investigation of the geochemical activity and eruptive behavior of Paricutin and of the petrology of its ash deposits and lava flows is for the purpose of adding to our knowledge of the poorly understood processes of volcanic eruptions and ore formation. Because the volcano area is itself a giant natural laboratory, it has been the object of a variety of studied—some of them of a continuous nature—not only in geology and geophysics, but also in biology, geography, agriculture, and other natural sciences.

6. Geology of Gulf Coastal Area and Continental Shelf, J. Ben Carsey, geologist, Humble Oil and Refining Company.

A coastal plain varying in width up to 100 miles borders the Gulf of Mexico in the southern portion of the United States. This plain is tilted 5 feet per mile toward the Gulf. This almost imperceptible slope extends out into the open water where the gradient is 8–12 feet per mile on top of the continental shelf, but steepens to 400–600 feet per mile off the edge of the shelf. This change in slope occurs at the 100-fathom line. The shelf is 50 miles wide south of Mobile Bay and 70 miles wide at the mouth of the Rio Grande, but reaches a maximum width of 150 miles between these points south of the Sabine River.

Several hundred salt domes have been discovered on the coastal plain, and domes have already been located by geophysical work in the open water. More than 140 dome-like topographic prominences with relief varying from 12 feet to 600 feet are present along the edge of the shelf.

The Mississippi River is building its delta across the shelf at the rate of one mile in 16 or 17 years and is now within 12 or 15 miles of the edge of the shelf. The natural levee along the Mississippi serves as a ramp from which oil operations have taken place, and ten or more domes are now producing from this ramp. These domes are well out on the shelf, thus there is actually nothing new about oil production from the shelf area.

7. Marine Exploration in Gulf of Mexico, C. T. Jones, manager, foreign exploration department, and Shirley T. Mason, senior geologist, Texas-Louisiana Gulf Coast division, Stanolind Oil and Gas Company.

Marine exploration is one of the most expensive types of development ever undertaken by oil companies; the great amount of capital which must be hazarded before any returns are assured, necessarily restricts these operations to the larger companies. To meet this enormous cost, some of the large companies, which otherwise are unrelated, have combined for marine work. A complete exploration department of landmen, geologists, and geophysicists is required. Operations of these integrated departments must be coordinated continually without delay by an understanding management. The risks encountered in marine work are great. In addition to executive efficiency, proper management calls for daring in the use of capital and clear vision as to future values of resources now uncommercial.

Modern marine exploration for offshore oil and gas fields was apparently started experimentally in 1940, but had not reached its present large scale until 1946. The first offshore leases of the present type were obtained off the coast of Louisiana in 1945 and off Texas in 1947. Leasing requirements are different in Louisiana and Texas, and the more favorable conditions in Louisiana have resulted in the greater development there. The tidelands title controversy remains unsettled. Government agencies, such as the Corps of Engineers and the U. S. Coast Guard, demand that all of their regulations be respected. The fishing interests of Louisiana and Texas have made it difficult for the oil companies to plan and execute exploratory campaigns properly, thus increasing the cost. The high rentals paid for leases force early development.

All types of geophysical exploration have been utilized in the Gulf of Mexico campaign. Originally, the gravity meter was used by lowering it with an operator in a diving bell; later, the present remote-controlled gravity meter was evolved. Magnetic surveying, using both airborne and boat-towed instruments, is also employed. Early seismograph work, with charges and seismometers on the Gulf floor, was slow and costly. Experience has greatly refined seismic methods until, today, this

* Published by permission of the director of the United States Geological Survey.