alteration, and have caused the permeability here to be reduced as compared with the opposite flank. 3. The presence of a much higher hydrostatic head on the mountainward or southwest flank as compared with its valleyward counterpart has also been offered as an explanation. In this connection, it has been argued that the difference in specific gravity of the oil and water is not sufficient, with a 600-foot hydrostatic head, to overcome the obstacles of surface tension, friction, and cementation on the high side of the water table. 4. Capillary-gravity action has also been considered a factor. 5. Finally, it has been suggested that the northeast flank had a much greater drainage area from which to draw its oil supply than did the southwest flank.

The fact that the anticline is *en échelon* with the adjoining structures at both ends, suggests that the forces causing this condition may have had a longitudinal component that could have tilted the north dome structure northward. Other structural and stratigraphic conditions in the field which might bear on the problem of an inclined water table are discussed; and questions are raised as to how much the genesis and migration of petroleum might be involved in a possible solution of the problem.

JUDSON L. ANDERSON, Petroleum Geology of Colombia, South America

As a petroleum producing country, Colombia ranked 8th in world production in 1940. Of the South American countries, Colombia is second to Venezuela, whose output is nearly ten times as great, and slightly ahead of Argentina. At least six petroliferous provinces may be recognized in Colombia. They are the Magdalena Valley, the southwestern basin area of Lake Maracaibo, the plains or "llanos" area in the southeastern part of the country, the coastal area of the Caribbean, the Goajira Peninsula and the Pacific coast region. The most important producing areas at present are the middle Magdalena Valley and the southwestern Lake Maracaibo area. Travel in the country is difficult except in the uplands where most of the roads are located. The native language is Spanish, English being spoken only sparingly.

Pre-Cretaceous rocks are known to occur in the Cordilleras Oriental and Central and also in the Llanos area, but are of no importance in the production of petroleum. Cretaceous limestones and shales are extensively developed east of the Central Cordillera and are highly petroliferous. Cenozoic deposits are found in the intermontane valleys, in the Llanos area and along the Caribbean coast. In the middle Magdalena Valley, there are important reservoir beds of petroleum.

Large overthrusts are characteristic features of the Magdalena Valley. They are also known to occur in the Llanos area in the valley west of the Cordillera Central and in the southwestern Lake Maracaibo basin area. In the Magdalena Valley and in the southwestern Lake Maracaibo area petroleum occurs on faulted anticlines. In the coastal region sharp anticlines, with some faulting, are known. Oil and gas seepages and mud volcanoes are of common occurrence. Little is known of the structure of the Goajira Peninsula and the Pacific Coast areas.

Production comes from Oligocene and Eocene sands in the middle Magdalena Valley. Two structures, Infantas and La Cira, produced all the oil of this region up to about 1943. Two new fields have been added to the above producers. The Barco area, located in the southwestern Lake Maracaibo basin, obtains its oil from the Cretaceous and Tertiary on faulted anticlines. In the Cesar Valley, located in the lower Magdalena Valley area, production of high gravity oil from Oligocene limestone has been reported in new wells.

BEN M. PAGE, Some California Tar Sand Deposits

The United States Geological Survey is mapping some of the California tar sand deposits that may be suitable for large-scale surface mining. It is contemplated that in some