Oil Shale and the Petroleum Problem

Chandonette Norris

Northwestern University, Evanston, Illinois

The threatening shortage of the oil supply of the United States as shown by increased oil consumption and diminishing reserves, constitutes a serious problem. In 1936 about one billion barrels were consumed, drawn from a reserve of thirteen and a half billion barrels. A consumption of one billion barrels and the addition of only nine hundred million barrels per year as estimated for 1936, represents an alarming shortage. With the yearly increase in consumption the reserves are inadequate. One solution of the problem lies in the utilization of oil shale of which the United States has enormous deposits west of the Appalachians and in Colorado, Wyoming and Utah.

An oil shale is a bituminous rock containing kerogen. Kerogen is a mixture of hydrocarbons not identical with the petroleum series. It must be processed to obtain the crude oil. Crushing prepares it for the retorts in which distillation takes place. The crude oil distilled from shale is more difficult to refine than petroleum crude for it contains a greater percentage of substances that must be removed. Each shale presents a different refining problem.

Shale oil has been used as a petroleum substitute in many countries, but competition with low petroleum prices has made government protection necessary. The Scottish product is aided by a tax on foreign gasoline and oil. The Esthonian government operates successfully a large shale plant by forbidding the importation of foreign fuel. By making use of a very economical process and cheap labor, Japan is extracting fuel for her navy from Manchurian deposits. With the application of sanctions during the Ethiopian war, Italy resumed distillation of shales in Sicily. The development of oil shales at this time by these nations is a result of their desire for economic independence.

However, in the United States shale oil must compete with very cheap petroleum. The high cost of shale oil is due to comparatively expensive processing costs which produce at present a slightly inferior oil. Competition must await a rise in petroleum prices, a time that now seems remote. Even then, oil shale may not be the substitute. Gasoline has been made by pressure cracking of coal-tar and by hydrogenation of coal. If these processes prove commercially satisfactory, the long-established coal industry may offer a more efficient and economical substitute.