

## GEOLOGY

# Future Oil From Rocks

The vast sources of oil from shale deposits will become increasingly exploited as mining methods improve and better means are found of extracting oil—By Barbara Tufty

► TOMORROW'S OIL may come not from wells, but from rocks throughout the world.

The world may contain 900 trillion tons of organic matter rich in oil, with an energy potential about 18,000 times the amount the world consumes each year, according to a report released by the U.S. Geological Survey, Department of Interior.

This is the first report to summarize the energy potential of rich oil shales of the United States and other parts of the world.

About 190 billion barrels of oil could be extracted under present conditions, reported Donald C. Duncan and Vernon E. Swanson of the Geological Survey's offices in Washington, D.C., and Denver, Colo.

About 325 trillion barrels are estimated in lower grade oil shales which are less accessible.

The enormous land areas of Asia include the largest deposits of oil shale—about 500 trillion tons of higher grade shale. The large land mass of Africa is next with about 370 trillion tons, the geologists estimate. The United States has about 120 trillion tons. For thickness and quality of the shale, the outstanding deposit of the world is in the rich Green River Formation of Colorado, Utah and Wyoming.

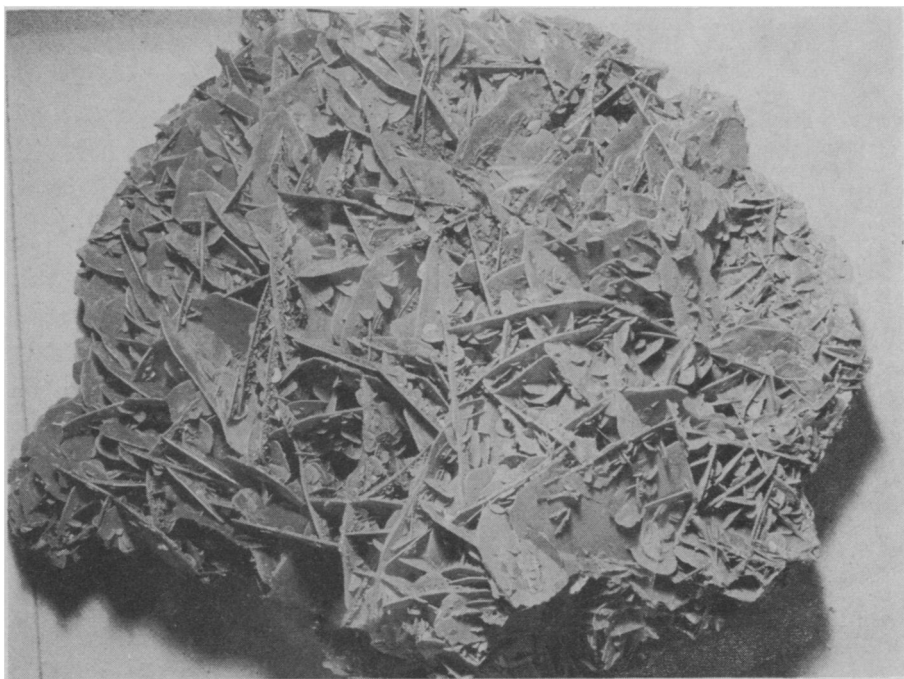
Oil shale is a type of rock formed by layers of deposited material rich in organic or once-living matter. It is composed mainly of remains of small plants, principally algae, which are rich in fats and waxes and which have partly decomposed under water. This material yields oil when heated in the absence of air.

Shale deposits were formed more than 600 million years ago, in the Cambrian period, and are still being formed in certain areas of the world, such as the northern lakes of North America, the fjords of Scandinavia and some coastal swamps and lagoons.

Some of the oil shale deposits have been mined in Scotland, France, Russia, Estonia, Sweden, Germany, Spain, South Africa, Australia and Manchuria. The largest oil shale industry in the world was started by the Japanese in Fushun, Manchuria, and has been developed by the Red Chinese.

There is continuing interest in obtaining oil from oil shales whenever the petroleum supply runs low. As mining methods improve and better methods are found of extracting the oil, these vast sources of oil will be more exploited, Mr. Duncan believes.

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Colorado School of Mines

**LEAF-SHAPED CRYSTALS**—This ten-inch specimen of a tungsten compound showing leaf-shaped blades of crystal is on display at the mineral collection at Colorado School of Mines. Crystals such as these grow slowly underground for thousands of years.

## GEOLOGY

## Rich Oil Produced In California Basin

► THE LAND BASIN around Los Angeles, one of the world's greatest oil producing areas, accounts for over six billion barrels of crude oil produced in the last 83 years, according to a report published by the U.S. Geological Survey.

The 2,600-square-mile area, bordering on the Pacific Ocean and extending northwest to the San Fernando Valley vicinity, northeast to the San Gabriel Mountains and south to Newport Bay, contains rocks that span a period from one million to 100 million years in age.

The area around Los Angeles has produced as much as 93 million barrels of petroleum per year, nearly one-third of California's total production, said R. F. Yerkes, geologist at the Survey headquarters in California and co-author of the report, "Geology of the Los Angeles Basin, California—An Introduction."

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## CONSERVATION

## 'Frail Lands' in U.S. To Be Rehabilitated

► THE UNITED STATES has 45 million acres of "frail" public lands, lands where the wind blows free, the rain beats down and the topsoil blows and washes away, according to a recent survey by the Bureau of Land Management of the Department of Interior.

Projects are underway to rehabilitate these lands, found in all western states, by methods such as rebuilding the depleted soils, building fences to prevent wind erosion, and planting vegetation to hold the soil from washing away.

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## GEOLOGY

## New Mineral Collection One of World's Biggest

► ONE OF THE WORLD'S largest mineral collections, which includes a piece of turquoise as big as a cantaloupe and a naturally-occurring sheet of copper the size of a dishpan, has been formed at the Colorado School of Mines.

The school's collection was more than doubled by contributions from the Colorado State Historical Society which gave its own rocks and minerals after almost a year of negotiations.

More important to the School of Mines than the miscellaneous rocks, gems and geological oddities, however, are the core samples—layer by layer records of rock strata—of which the school has 138,000, and the mined ores. Only the Smithsonian Institution in Washington and another collection in Germany are more complete in this field, said G. A. Franz Jr., Deputy Commissioner of the Colorado State Bureau of Mines.

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