

## MINING

# Fuel from Oil Shale

Scotland is now in its one hundredth year of crude oil production from shale. America entered this production late because the U. S. has had much natural petroleum.

► SCOTLAND next July will celebrate the hundredth anniversary of its oil-shale industry, and its production has been continuous during this period, Dr. Simon Klosky, oil-shale chemist of the U. S. Bureau of Mines, stated in Washington, D. C.

Dr. Klosky spoke as guest of Watson Davis, director of Science Service, on Adventures in Science, heard over the Columbia Broadcasting System. He reviewed the production of gasoline and heating oils from shale in Western Europe, giving information acquired during a recent inspection trip.

"In this 100 years of the Scottish oil-shale industry, it has had many ups and downs," he stated. "From a flourishing start in 1850, to a temporary depression around 1880 due to importation of American petroleum, it passed to a relatively steady existence, relieved only by the demands for more liquid fuel products brought on by the two world wars."

He described a process in Sweden by which petroleum vapors and gases are obtained without mining the shale. Holes are drilled deep into the earth and into the natural layers of shale, and electric heating elements are lowered in the holes. After weeks of heating, petroleum vapors are collected from other holes. The process, he said, seems practical where plenty of cheap electricity from hydroelectric plants is available, and the price of gasoline is relatively high.

Three plants in France, visited by Dr. Klosky, were described. One has been in operation since about 1880. This refinery was operated with great difficulty during the recent German occupation, but "it managed to keep going and to sequester enough of its products to refuel American combat tanks when they arrived."

Although unable to visit oil-shale industry behind the Iron Curtain, information on Estonian and Russian reserves was obtained by other means. Estonia in prewar days produced more crude oil from shale than any other country, and Russia produced almost an equal quantity. Estonian shale deposits extend eastward well into Russia proper, and the Soviets have large deposits on the Volga river and in other places.

America's entrance into the production of oil from its vast deposits was delayed behind European activities merely because the United States had vast quantities of natural petroleum. Now the point has been reached where liquid fuels from petroleum

must soon be supplemented by synthetic fuels from coal and oil-shale. Dr. Klosky described two plants of the U. S. Bureau of Mines now in operation, the plant at Louisiana, Mo., for production from coal, and the plant at Rifle, Colo., where liquid fuels from oil shale are now successfully extracted.

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## METEOROLOGY

## Skyhooks of Plastic Aid Weather Forecasts

► TO help forecast weather for airways and ground-dwellers alike, giant balloons—skyhooks they are called—will be floating about 20 miles high over the oceans when plans being made in Washington, D. C., are materialized.

Made of a new plastic, polyethylene, and standing 129 feet high when inflated, the outside, tear-drop-shaped balloon has been

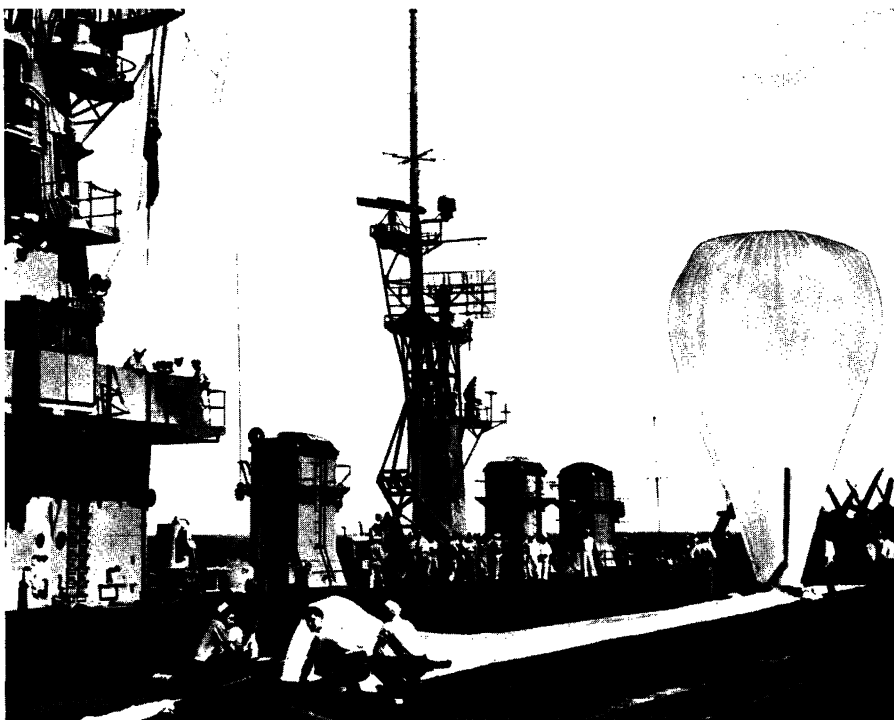
developed by the U. S. Navy for use in catching cosmic rays and observing the sun's spectrum from outside most of the earth's atmosphere.

Its ability to drift with air currents at constant heights well suits the skyhook to weather observation needs, Earl G. Drosler, Office of Naval Research meteorologist, told the American Meteorological Society. It can lift about 80 pounds of recording and transmitting equipment. Its path can be tracked with radar, and being large, it can also be followed visually to great heights.

The disadvantage of balloons commonly used today is that they do not stay at one altitude, and to arrive at weather readings for a given level it is necessary to approximate the information by interpolation.

By increasing the balloon's payload, which can be accomplished by using the balloons in clusters, he foresaw that the recently proposed scheme to adapt the skyhook balloon to a trans-ocean weather observation network might become a reality.

The trans-ocean-sounding system referred to was proposed by Capt. Howard T. Orville of the Office of Naval Research, ex-president of the American Meteorological Society. Capt. Orville suggested that the skyhooks be rigged to drop 'chute-born radiosonde equipment at timed intervals over the ocean to transmit a set schedule



**"OPERATION SKYHOOK"**—High-altitude plastic balloon which reaches 18 to 20 mile heights is being readied for ascent on the flight deck of USS SAIPAN during recent cosmic ray tests in the Caribbean. When the balloon is full, it stands 129 feet tall or about as high as a 12 story building.