

ENGINEERING

Liquid Fuels from Coal

We can be made self-sufficient for centuries by converting domestic coal, of which there is an ample supply, to oil.

See Front Cover

► LIQUID FUELS from coal, for automobiles, airplanes, powerplants and heating, can meet American needs for centuries, the nation was assured by Dr. W. C. Schroeder, chief of the Office of Synthetic Liquid Fuels of the U. S. Bureau of Mines. They will be made from domestic coal, of which the United States has ample supply, and will make the country self-sufficient in this respect whatever the future holds.

Dr. Schroeder discussed synthetic liquid fuel production in St. Louis as a guest of Watson Davis, director of Science Service, Washington, D. C., on Adventures in Science, heard over the Columbia network. Dr. Schroeder is en route to Louisiana, Mo., to the dedication of the new government Coal-to-Oil Demonstration plants. The train on which he and party will travel the 90 miles between St. Louis and Louisiana will have a diesel engine powered with synthetic oil produced at the new plant. This makes railroad history. Diesel locomotives are plentiful, but this is the first to operate on synthetic oil.

The new coal-to-oil plants at Louisiana can produce a full range of liquid products from coal, he said. First of their kind in this country, they can make aviation gasoline, motor gasoline, diesel oil, heating oil and fuel oil—all from coal. These products can be used in present-day motor cars, airplanes, tractors, oil burners, and all other such equipment without change or modification of the equipment itself. In addition, these plants will produce phenol, alcohol, and other valuable byproducts.

Two plants to produce liquid fuels from coal are to be used at Louisiana. They will demonstrate for private industry the respective merits of two basic processes for converting American coal to oil. These are the so-called hydrogenation process and the gas synthesis process.

These two processes are complementary rather than competitive, he stated, and each is best adapted to produce different products. For example, the hydrogenation process excels in the production of high-octane aviation gasoline and heavy fuel oils, whereas the gas synthesis process is the better of the two if motor gasoline is desired. One of these demonstration plants is now in use; the other will be before the end of the year.

The hydrogenation demonstration plant is shown on this week's cover of SCIENCE NEWS LETTER, with stalls of heavy reinforced concrete enclosing on three sides the

giant chrome steel converter vessels in which coal is transformed into oil. These compartments are for the protection of operators in the event of fire or explosion.

Getting demonstration plants in operation is only the beginning of the job, he con-

PHYSICS

Soft X-Rays from the Sun

► DISCOVERY of X-rays in the upper reaches of the atmosphere probed by high-flying V-2 rockets was reported to the American Physical Society in Washington by a team of scientists from the Naval Research Laboratory.

Believed to come from the sun, these soft X-rays, actually gentler than those used by a dentist, are responsible for the ionosphere or electrified air layers in the atmosphere that reflect the radio waves and enable them to travel long distances.

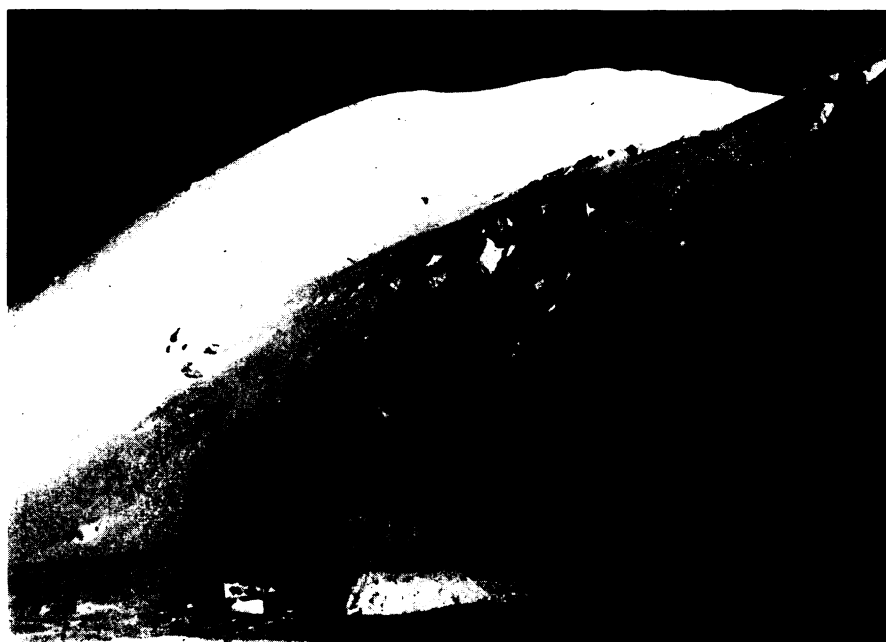
tinued. A vast fund of information now must be collected from plant operations and from the laboratories of the oil and coal industries for the sound engineering of the very much larger commercial plants.

Then, before we can have synthetic oil and gasoline for furnaces and cars, these commercial plants must be built. Legislation has been introduced in Congress to encourage private industry to build the initial commercial-scale plants. After the construction of these initial plants, we can depend upon our great petroleum, coal and engineering industries to develop the new enterprise without using taxpayers' dollars, Dr. Schroeder concluded.

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Extremely short wavelength ultraviolet radiation was also detected by the rocket flights of last Nov. 18 and Feb. 17 from White Sands, N. Mex. These radiations, shorter than 1300 Angstrom units, are stopped by ordinary air and have been observed heretofore on earth only when they were generated in a vacuum.

Theories have hitherto credited the sun with giving forth radiations like those now observed to cause the radio-reflecting layers but they have never been discovered before.



HIGHEST LABORATORY?—To study the cosmic rays which bombard the earth from outer space, University of Chicago scientists parachuted equipment to a saddle of Mount McKinley in Alaska and climbed up to their new base, 18,000 feet above sea level. The Chicago physicists, Albert B. Weaver and Marcel Schein, may hold the honor of having set up the world's highest land-based laboratory. Other, more permanent high altitude laboratories are at Morococha, Peru (14,900 feet) and Mount Evans, Colo. (14,156 feet).