CHEMISTRY

Experimental Plant Making Gasoline From Coal Shown

A SPECTACLE that would have thrilled the ancient alchemists who tried to make gold from lead was shown to chemists meeting in Pittsburgh during the past week.

The U. S. Bureau of Mines' new plant for making oil and gasoline from coal by the Bergius process was on display during the meeting of the American Chemical Society. It is the first and only one of its kind in the United States.

Continental European nations—lacking the vast oil resources of the United States—have many coal hydrogenation plants in operation. Germany, for example, expects to be able to produce 450,000 tons of this synthetic gasoline yearly by the end of 1936. The Bureau of Mines experimental plant, by contrast, is a small "preparedness" plant looking forward to the time when and if the United States will need to use its vast coal resources as a potential source of oil and gasoline and their by-products.

Discoverer of the process for making coal into oil was Dr. Friedrich Bergius, the noted German chemist, who won the Nobel prize in chemistry for his work plus his equally important discovery of the way to make sugar out of wood. Both researches were outgrowths of Germany's drastic World War needs. Dr. Bergius attended the Pittsburgh meeting of the American Chemical Society and saw the hydrogenation plant.

The coal-gasoline Pittsburgh plant was constructed under the direction of Dr. Arno C. Fieldner, chief of the U. S. Bureau of Mines technologic branch.

In charge of the Pittsburgh experiment station and the hydrogenation program is Dr. H. H. Storch, physical chemist of the Mines Bureau. He explains the process as simple on paper but complex and costly in operation. Coal is powdered; mixed with some oil previously prepared in the process to form a paste; further mixed with a catalyst to speed the reaction; pumped into a compression chamber; and hydrogen is passed through. The reaction is under high temperature and pressure.

By choice, either gasoline, heavy oil or intermediates can be obtained as the principal end product.

The future of the process, as has already been demonstrated abroad, is in the production of gasoline, of which the world consumes about ten times as much as it does oil. The drawback to the process in a nation like the United States—with cheap oil—is in the expense. Dr. Fieldner estimates that the cost of producing a gallon of gasoline by coal hydrogenation is about three times that of producing a gallon by refining crude oil. The initial cost of a hydrogenation plant, too, is great.

Dr. Fieldner explains that the Bureau of Mines is "looking ahead." Experts disagree on exact figures, but the Bureau of Mines points to a compromise estimate of 15 years as the life of this nation's proved oil supply—an increasing consumption balancing the greater output of gasoline from better refining and cracking processes.

The role that plentiful coal may play is explained graphically by Dr. Fieldner. The total supply of coal in the United States, if spread over Ohio's 41,000 square miles, would cover the state with a layer 76 feet deep.

The nation's present oil supply would cover Ohio with a pond only three quarters of an inch deep.

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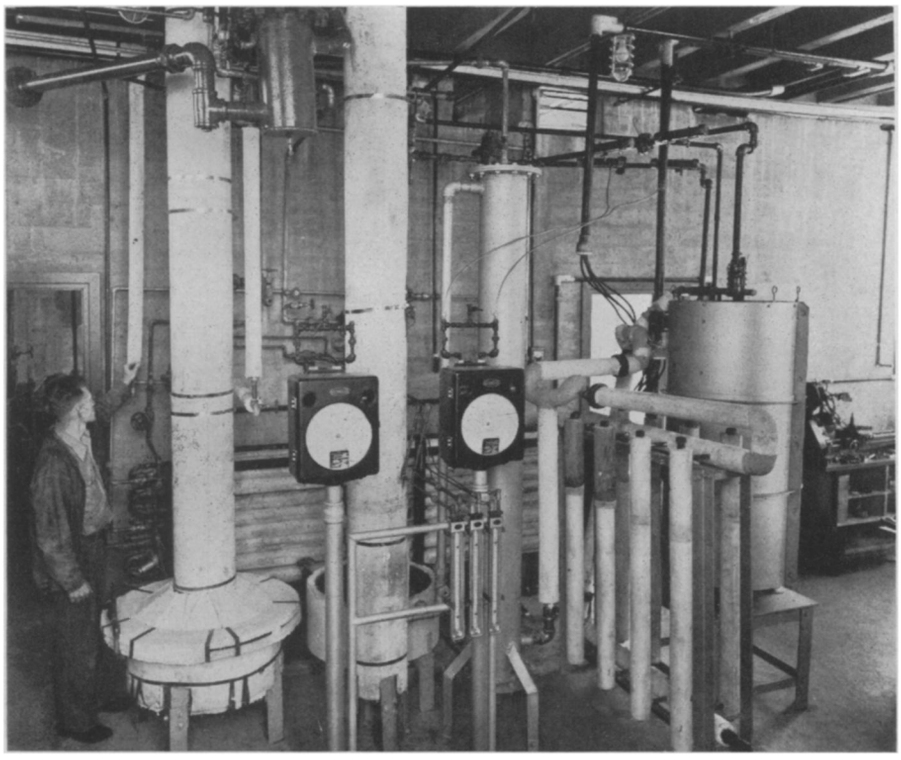

WHERE COAL IS TURNED TO OIL

Here in the hydrogen mixing room of the Bureau of Mines' experimental plant, hydrogen atoms are added to coal dust paste to make the larger petroleum molecules.

CHEMISTRY

Food From Waste Wood is Problem of German Chemist

By DR. FRIEDRICH BERGIUS
As Told to Robert Potter

SO YOU want to learn how German industrial chemistry differs from the comparable American chemistry? Over here in America as I make this all too brief visit to the meeting of the American Chemical Society in Pittsburgh and then rush on to Cambridge for the Tercentenary Celebration of Harvard University, I hear much talk on the most interesting problem of finding new uses for industry in the products of agriculture; how you are turning soy beans into lacquers for your automobiles, making paper from your southern pines and trying to find uses for your great food crops. (*Turn to page* 191)