ENGINEERING

Gasifier Converts Coal

This may prove a cheaper way of deriving gases to be used for making synthetic liquid fuels. The method does not require the use of coking coals.

➤ A NEW TYPE continuous gasifier for use in the process of making synthetic liquid fuels from coal has successfully passed a full-scale test run, it was revealed by officials of the U. S. Bureau of Mines. The installation is in the Bureau's demonstration plant located in Louisiana, Mo.

This new type gasifier does not require the use of coking coals. Briefly, its cycle involves first crushing, pulverizing and drying the coal. Then, suspended in oxygen and accompanied by superheated steam, the coal is fed into both ends of the gasifier. There the conversion to synthesis gas takes place at temperatures up to 2,500 degrees Fahrenheit. The unit is designed to use about 28 tons of coal, 24 tons of oxygen and 35 tons of superheated steam to produce some 2,000,000 cubic feet of the raw gas daily.

Steam required for gasifying the coal is superheated in a pebble heater fired by gas. The oxygen is extracted from the air at temperatures more than 300 degrees below zero Fahrenheit in a Linde-Frankl unit originally used in making chemicals in Germany.

In a four-hour test, approximately 70,000 standard cubic feet per hour of gas was made. The product contained 37% carbon monoxide, 42% hydrogen, 16% carbon dioxide, 4% nitrogen and the rest miscellaneous. Bureau officials are hopeful that they can reduce the carbon dioxide content and obtain a higher yield of still better synthesis gas in later runs after they become more familiar with the operating characteristics of the new gasifier.

The Bureau's efforts are directed toward a cheaper method of converting coal to the gases from which the synthetic liquid fuels, including diesel oil, heating oil and gasoline, are made. Gasification, it states, is the number one cost and process problem requiring solution before competitive gasoline and oil can be made from coal by either of the two basic processes employed in the recently-dedicated plants there.

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MINERALOGY

Search for Hidden Ores

➤ IT IS going to take a lot of money to discover new deposits of mineral ores to replace present deposits facing depletion, the United Nations Scientific Conference on the Conservation and Utilization of Resources (UNSCCUR) will be told at its meeting at Lake Success next August, it was revealed by Dr. Anton Gray of the Kennecott Copper Corporation, New York.

The day of the oldtime prospector, with pick and shovel and grubstake, is largely over. Only a financially strong company can carry out efficiently the search for hidden deposits, the international group will be told by Dr. Gray. Only a government can afford, under present conditions, to carry out adequately exploration for unknown mineral districts.

Mineral deposits for the most part have been found in groups, or districts, in which the individual deposits occur under the same geological conditions and usually contain more or less the same metals. There are, also, what are apparently isolated deposits, although if the truth were fully known many of these probably would not be isolated.

The possibilities of discovery, the costs and the methods that would apply to explorations for new districts differ greatly from those that apply to explorations within a known district. Searching for an extension to a known deposit, a new ore body, is an easier problem and one being solved continuously by every mining company in the normal course of its development. Dr. Gray expressed the opinion that in the near future most new mineral sources will result from the discovery of extensions to known deposits.

New mineral districts, he indicated, will most likely be discovered only as present inaccessible parts of the earth are made accessible and under the incentive of greater need than we now have for the metals and higher prices for them. There may be mineral districts in the old rocks that are hidden under the sediments of the Mississippi Valley. There may be great mineral deposits under the swamps of the Amazon or beyond the shorelines on the continental shelves.

No prospector could ever find these, no private company could afford to search for them with the methods and tools available today; and yet with increasing geological knowledge and better tools they might be found, he said. Such explorations will be taken only by, or with the cooperation of, governments, and only as metals become very scarce and dear.

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ASTRONOMY

Plan Study of Sun with Balloons over Hudson Bay

➤ COSMIC RAY equipment carried aloft over Canada's Hudson Bay by balloons next month may help tell scientists about the sun's surroundings.

Intensity of cosmic radiation at northern altitudes will be measured by Geiger counters carried up to heights of 20 miles from Churchill, Manitoba. And these measurements may hold important clues to the suspected existence of a constant magnetic field around the sun.

Dr. Martin A. Pomerantz of the Bartol Research Foundation of the Franklin Institute, Swarthmore, Pa., will head the expedition. He will be assisted by Robert J. Kerr and Robert C. Pfeiffer, both of the Foundation.

If the sun has a constant magnetic field like the earth's, then cosmic radiation should remain constant north of a certain latitude. Otherwise, if there is no such field around the sun, the intensity of cosmic radiation will increase as the north pole is approached.

Free-balloon flights, each carrying a fourfold coincidence arrangement of counters, will be launched to make the ray measurements in the North. Data will be transmitted automatically to a receiving station on the ground.

The project is being sponsored by the National Geographic Society and the Bartol Foundation. Cooperating in the study will be the National Defense Board of Canada. This new cosmic ray venture is a part of a continuing program supported by the Air Force and the Office of Naval Research.

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GEOLOGY

Canada's Gold Mined in World's Oldest Rocks

➤ GOLD-BEARING rock formations in Canada, in the provinces of Ontario and southeastern Manitoba, constitute the world's "oldest known orogenic belt", states Dr. Patrick M. Hurley of the Massachusetts Institute of Technology in the journal, SCIENCE (July 8).

Age measurements based on radioactivity of rock samples and on helium trapped in the material range from 2,000,000,000 to 2,400,000,000 years. The formation which runs in a fairly continuous belt of volcanic and sedimentary rocks, appears to consist of the roots of an exceedingly ancient mountain range, eroded away no one knows how long ago.

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