ENGINEERING

Fuel Generates Electricity

➤ INCREASED RESEARCH on an electrochemical device for the generation of electricity directly from burning fuel is needed.

When developed beyond the present laboratory stage, the device, known as a fuel cell, could eliminate the need for furnaces, boilers, steam lines, turbines and generators.

Everett Gorin and Howard L. Recht of the Consolidation Coal Company of Library, Pa., described their work on fuel cells at the American Society of Mechanical Engineers meeting in New York. They said that, although there has been sporadic research on fuel cells for almost a century, there has not been a decided awakening of interest before recent years, and that new cells are beginning to meet the demands of steady output.

Mr. Gorin described his fuel cell as an electro-chemical device similar to a storage battery, which operates by feeding a fuel continuously through the cell along with an oxidizing agent. A gaseous fuel, such as hydrogen or carbon monoxide, is used. Ultimately, the authors said, such gases could be produced from the world's abundant supply of coal.

The combustion of fuel in the cell is carried out in such a manner that electricity is generated rather than heat. This is done by having two electrodes, a fuel electrode and an air electrode. The two gases contact these electrodes but do not mix with one another. They are separated by a diaphragm that serves two purposes. It prevents the ordinary combustion reaction when two gases mix, and acts as an electrolyte, conducting the current and completing the electrical circuit.

The fuel cell differs from an ordinary storage battery, said Mr. Gorin, in that it does not run down like a battery. It operates continuously as long as it is supplied with a fuel and an oxidizer.

To compete economically with existing power generating systems, fuel cells would have to be reasonably small, cheap to build, long lasting and efficient fuel burners. If such fuel cells could be developed, said the authors, they would permit coal to be competitive with nuclear power, as far as fuel cost is concerned, for a much longer period than would be the case for a conventional steam plant.

The work described by the authors was carried out under the sponsorship of the U.S. Army Signal Corps.

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ANTHROPOLOGY

Trace Early Man

➤ A GEOLOGICAL period that brought with it intense cold was of great importance to the history of mankind, Dr. Ralph S. Solecki, Smithsonian Institution, told the American Anthropological Association meeting in Washington.

This period, known to scientists as Würm III, sent the people of Europe fleeing for their lives from the bitter, killing cold. It lasted from about 25,000 years ago to 11,500 years ago. It was one of the coldest times in the Pleistocene.

Central Europe, Dr. Solecki told his colleagues, was pinched between the mountain glacier of the Alps and the Scandinavian ice shield, allowing only a narrow though apparently still passable ice-free corridor between.

During this period, too, the locking up of the sea water in the glaciers caused the shallow sea between Alaska and Siberia to be laid bare, allowing animals and man to cross into the New World.

Shanidar Cave in Iraq, which has given us such a comprehensive picture of the prehistoric life of early man, was occupied for at least 100,000 years and is still a human home today.

But in that cave, as in other important caves of the Near East, no trace of human occupancy was found that can be dated for the period between 25,000 and 13,000 years ago. Shanidar Cave, Dr. Solecki explained, lies at 2,500 feet altitude on a steep mountain face.

Since the glaciers during the Würm maximum reached to about 4,500 feet, presumably the cave was not habitable by men during that time.

People living in the New Stone Age village of Zawi Chemi in what is now Iraq, like wealthy people today, may have had a winter residence and a summer home, Mrs. Rose Lilien (Mrs. Ralph Solecki) told the same meeting.

These people were among the first to emerge from their cave dwellings to live in the open air. They probably occupied their village homes in Zawi Chemi in the spring, summer and fall and went back to their refuge in Shanidar Cave in winter.

Although we cannot be sure that these villagers had a real agriculture, plant food must have been a major item of their diet. This is shown by the large number of milling tools they left behind them. No sickle blades were found, but the very abundant spall choppers were found to cut grass very efficiently.

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CHEMISTRY

Swedish Chemist Receives Atoms for Peace Award

➤ A FAILURE in a laboratory project started chemist George Charles de Hevesy off on research that resulted in his being named winner of the second Atoms for Peace Award.

More than 40 years ago, Prof. de Hevesy, a staff member at the Research Institute for Organic Chemistry, University of Stockholm, Sweden, failed in his attempts to separate "Radium D" from lead. This resulted in his development of the use of the radioactive element, now known to be an isotope of lead and not readily separable from it by chemical means, as a tracer for studying chemical processes involving lead. Since then the chemist has pioneered in the use of radioactive tracer techniques in chemistry, biology and medicine.

In announcing the award, Dr. Detlev W. Bronk, president of the Rockefeller Institute and of the National Academy of Sciences, pointed out that Prof. de Hevesy "was the first to apply both natural and artificial isotopes to the study of plants and animals; he introduced the use of stable isotopes and he was the first to explore the possibility of creating radioactive substances within the system being studied by means of neutron bombardment.

"These discoveries, now adopted in laboratories and hospitals all over the world, are certainly among the most important advances in the peaceful use of atomic energy in our time."

Prof. de Hevesy, who was awarded the Nobel Prize in Chemistry in 1943, will come to the United States in January, 1959, to receive a gold medallion and the $75,000 prize money. He was selected unanimously by the awards committee from a list of 111 nominees representing 19 countries throughout the world.

Created as a memorial to Henry Ford and his son Edsel, the award was established in response to President Eisenhower's 1955 Geneva appeal for international efforts to develop nuclear energy for peaceful purposes.

The first award was presented to Dr. Niels Bohr in 1957.

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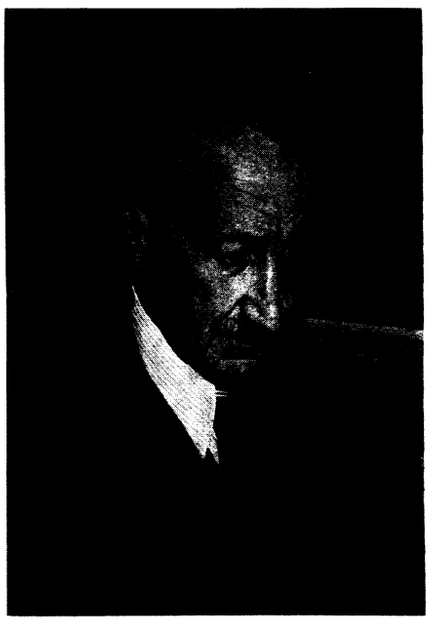

AWARD WINNER—Prof. George Charles de Hevesy received second Atoms for Peace Award.