DIVERTING EARTH'S WATERS ***—A salt-water canal will route Mediterranean water into the Dead Sea, to replace fresh water from the Jordan river system, diverted for irrigation purposes through a second great canal. This picture shows fresh water being run onto salt flats near the Dead Sea to leach out the minerals and make the land suitable for cultivation.***

worse than wasted. While the eventual aim is to have all these tamed wadis fit into the unified irrigation and water-power system, obviously they can be taken in hand one by one, by either Jews or Arabs, according to whose land they lie in.

A good deal of water is expected to be obtained by tapping the underground drainage system with wells. These also can be dug and operated separately; though it is true that power for pumping will be much cheaper when the major hydroelectric plants that depend on joint action by Arabs and Jews can be built.

These partial operations are not mere salvage of scraps. They represent a really respectable fraction of the total new acreage which it is hoped will eventually be brought under irrigation. The final figure is expected to be somewhere in the neighborhood of 750,000 acres. The partial reclamations which can be carried out by the Jews alone will amount to at least 340,000 acres, mostly in the now arid coastal plain. The Arabs can reclaim about 100,000 acres without Jewish help. Moreover, declares Dr. Lowdermilk, this new land can be added within two years if work is started promptly.

Even for the full realization of the JVA project, some time will have to be spent in research on some of the unique problems involved in the handling of the great volume of sea water to be channeled from the Mediterranean into the Dead Sea. All hydroelectric plants now in existence are run by fresh water. What kind of metals, and what type of turbine, will be needed for the great power plants? There is a challenge to metallurgists and engineers alike.

Palestine, like all the Near and Middle East, is a land where earthquakes sometimes happen just as they do in California. Some very careful planning and experimental work will be needed to protect the large-scale engineering structures that will eventually be built. Here is a big job for the new profession of geophysics.

These are only a couple of the problems which the JVA engineers and administrators will have to meet and master. There is every reason to expect that these problems will be solved, and that twentieth century science will do much to make Palestine, for Jew and Arab alike, once more a land of milk and honey.

Science News Letter, March 20, 1948

CHEMISTRY

Fuel from Natural Gas

➤ GARDEN CITY, KANS., will soon become a gasoline-producing center. This motor fuel and other petroleum products are to be manufactured there from natural gas, from the neighboring Hugoton Field, which is not desirable for ordinary uses because of its low heating qualities.

The manufacturing plant is to be built by Stanolind Oil and Gas Company of Tulsa, Okla. It is a multi-million-dollar project. It will include a plant to extract liquefiable hydrocarbons such as gasoline, butane and propane from the natural gas; a synthesis plant including an oxygen-production unit; a chemical refining unit; laboratories and other buildings. The gasoline and fuel oils produced will be marketed largely in the Kansas area. The chemicals produced will be distributed nationally by U. S. Chemicals, Inc.

The huge Hugoton Field of southwestern Kansas is claimed to be the largest gas field in the United States and to contain 23,000,000,000,000 cubic feet of gas, part of which has low heating qualities. The new plant will process about 100,000,000 cubic feet of this gas daily, it is expected.

In the process, dry feed gas from the field is burned under 300 pounds pressure with relatively pure oxygen to yield synthesis gas from which the final products are made. This synthesis gas is largely carbon monoxide and hydrogen. With the help of an iron catalyst in a fluidized state, being finely powdered, it is converted into the petroleum hydrocarbons and water.

Another plant for making gasoline and other hydrocarbons from natural gas is under construction in Texas. It will use gas of real fuel value, it is understood, not the low-heating-value gas to be used in Kansas. The supply of natural gas in America is limited, of course, but there is enough to permit the manufacture of liquid fuels from it for the next 25 years without danger to the amount needed for gas lighting and heating.

Science News Letter, March 20, 1948

CHEMISTRY

Convert Waste into Fuel

➤ THOSE great heaps of waste anthracite silt near hard coal mines may soon be furnishing homes with fuel gas and automobile engines with liquid fuel, President Frank W. Earnest, Jr., of the Anthracite Institute, Wilkes-Barre, Pa., revealed.

A new process for converting the present waste into fuel will be tested in a pilot plant under construction by the Institute's research organization of which Dr. Raymond C. Johnson is in charge. In the anthracite country there are an estimated 200,000,000 tons of this silt immediately available, and more is produced every year.

Anthracite silt, washed out of the coal after mining, is about as fine as granulated sugar. It is not suitable for burning in grates and has accumulated at mine heads for years. Its use to produce fuel gas and liquid fuels will in no way decrease the available supply of marketable coal.

Do You Know?

Rats average 10 young to a litter, and may have up to 12 litters a year.

The *pearling* industry in Australia is expanding to meet American demands.

What is called the High C variety of *tomatoes* has at least twice as much vitamin C as the standard varieties.

There are nearly 192,000 railroad *bridges* in the United States; the sum of their lengths is about 4,000 miles.

Sugar is primarily a food, but it is used in hair tonics, shoe polishes, adhesives, photographic materials and explosives.

Sugar cane is a tall perennial grass; its stalk is divided into sections by joints, and each section contains a bud which will sprout when planted.

Anthracite silt is an excellent fuel for the production of these gases, Dr. Johnson states, because it is non-coking, non-caking, free of tar, has a low sulfur content and a high ash-fusion temperature. The new process is related to the German method for gasifying brown coal. In it, the anthracite silt can be processed into three gases, two of which are fuel gases.

In the process, anthracite silt, air and steam are fed into a refractory-lined cylinder. Combustion takes place with the silt boiling inside the cylinder while the heavier ash settles to the bottom and is ejected by a rotary grate. The gas obtained is fed through a second bed of burning silt, fortifying it with additional carbon monoxide. The result is producer gas.

If gas of higher heat quality is desired, steam is forced into the burning silt in the second stage of the process. To produce gases from which liquid fuel is made, the same method of fluidized or boiling combustion bed is used. However, by intermittently blowing air and steam into the combustion chamber, or by using a continuous blast of oxygen and steam, a synthesis gas of carbon monoxide and hydrogen is produced. It is from these the liquid fuel is made as is done in making liquid fuels from natural gas or other coal.

Science News Letter, March 20, 1948

MEDICINE

Anti-Leukemia Weapon

➤ ARSENIC made radioactive in the atomic pile is now being tried in the treatment of leukemia and Hodgkin's disease, a group of University of Chicago and Argonne National Laboratory scientists reported at the meeting in Atlantic City of the American Association for Cancer Research.

The scientists are Drs. William Neal, Leon O. Jacobson, Austin M. Brues, Howard Ducoff, Robert Straube and Thomas Kelly.

"Very nice responses" have been obtained in some of the 12 patients treated so far. But, Dr. Jacobson cautioned, he does not know how long the improvement will last or even whether the present improvement is any better than the temporary responses obtained with other kinds of radiation treatment.

Use of the radioactive arsenic was started about nine months ago. It is being tried in the hope of obtaining both the chemical effect of ordinary, stable arsenic and the radiation effect of the radioactive chemical. Arsenic, as physicians know, has been used for treatment of leukemia and allied conditions since 1878.

The radioactive arsenic was first used in tracer studies on both laboratory animals and humans. These studies showed that the chemical was quickly and widely distributed throughout the body, which meant that its penetrating rays would get to the parts of the body where they were needed. The tracer studies also showed that the chemical is rapidly excreted, so there would be no danger from over-long irradiation.

Additional safeguard in the use of radioactive arsenic is the existence of BAL, or British Anti-Lewisite. This chemical can remove radioactive arsenic from the body as quickly as it removes the stable form of arsenic.

The radioactive arsenic used is arsenic^{76}. It has a short half-life, 25 hours, and must be used pretty rapidly after it comes from the atomic pile. It is made by pile irradiation of cacodylic acid, an arsenic-containing compound.

Science News Letter, March 20, 1948

MEDICINE

Breast Cancer in Mice

➤ A CANCER experiment which brought results exactly the opposite of the ones the scientists expected was reported by B. E. Bennison of the National Cancer Institute at the meeting in Atlantic City of the American Association for Cancer Research.

The experiments concerned the breast cancer in mice which is transmitted through some agent in the mouse mothers' milk. The agent is thought to be a virus. Since the spleen helps in resistance to ordinary infections, Dr. Bennison removed the spleens from young mice who had been nursed by mothers carrying the cancer-causing agent in their milk. He expected the young mice to develop cancers at an earlier age than these usually appear.

Instead, it took longer for the cancers