

MEDICINE

Cobalt for Cancer Tested

This radioactive material is being tested at four institutions to determine standard dose for treatment. Will be a cheap and plentiful substitute for radium.

► TESTING of radioactive cobalt from the atomic pile for treatment of cancer patients is now under way at four institutions.

This is the material which Chairman David E. Lilienthal of the Atomic Energy Committee told President Truman could become a cheap and plentiful substitute for costly radium now used in cancer treatment.

The four institutions where the new material is being tested are: Ohio State University, at Columbus, Ohio; Memorial Hospital in New York; the University of California at San Francisco and Washington University at St. Louis.

Cancer patients generally may not get radioactive cobalt treatment for some little time. This is not because of any production bottleneck. It is because the dose has to be standardized. This is a job for experts and is what is now being done. But it may take two or three years or even longer, A.E.C. officials said. They pointed out that it took 25 to 30 years for standardization of radium dosage.

The material will cost only about a tenth of what radium costs, it appears from comparison of present prices. A.E.C. list price for one unit of radioactive cobalt is \$33 f.o.b. Oak Ridge, Tenn. To this must be added a \$25 handling charge, made on all shipments of radioactive material from Oak Ridge, and the shipping charges on the unit in its 200-pound lead container. The total would probably come to between \$60 and \$75. The cost of an equivalent amount of radium, on a dosage basis, would be \$500. To this must be added insurance, which is very costly on radium, and handling and packing charges. Radium, because of the radon gas which emanates from it, involves a more difficult handling problem.

Smaller hospitals usually borrow or rent their radium from larger institutions, because it is so scarce and costly they cannot afford to own any. Some larger centers have theirs on loan from the National Cancer Institute of the U.S. Public Health Service.

Radioactive cobalt would be used in needles or tubes in the same way that radium is used for cancer treatment. It

cannot be used in a colloidal form, as radioactive gold is now being used, because it has too long a half life. Its half life is 5.3 years. An advantage of the colloidal form in which radioactive gold is being used is that not only gamma radiation but also beta radiation from

MEDICINE

New "Blue Baby" Disease

► SANITATION chemists were alerted to the hazard of a new "blue baby" disease that comes from nitrates in drinking water.

The disease may be confused with congenital heart disease, which also produces "blue babies," but it is not the same condition, James G. Weart, sanitary engineer of the Illinois Department of Public Health, explains in his report to the American Chemical Society meeting in Chicago.

Infant methemoglobinemia is the name of the blue baby disease that comes from too much nitrate in drinking water. The disease is apparently limited to babies under six months of age.

In Illinois alone 33 cases of the disease with five deaths have been reported in the past year. Cases are being reported with increasing frequency in Iowa, Kansas, Oklahoma, Texas, Nebraska, Missouri, Minnesota and Michigan as well as Canada and Belgium.

The disease may also exist in the richer agricultural areas of Europe and Asia, where soil and water conditions would favor its development. The role of water in causing the disease has only been known since 1945, so more cases may be reported as physicians become familiar with the symptoms.

Babies usually recover swiftly if a satisfactory water is substituted for the high-nitrate water in their formulas and drinking water. But in countless rural homes no other source of water is available and there is no practical way of removing the nitrate from the water. For this reason Illinois doctors have been advised not to prescribe feeding formulas involving water unless the nitrate content of the water is known to be within

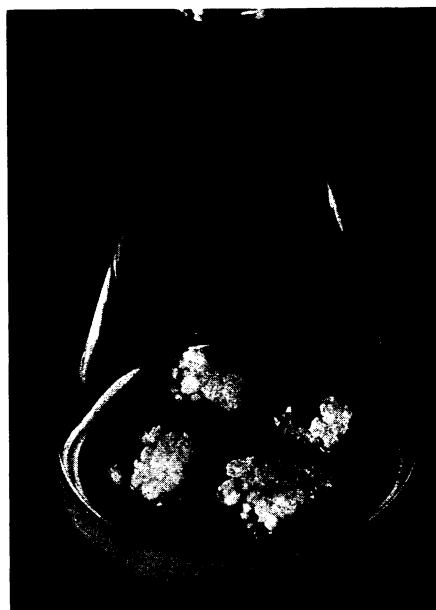
many billions of point sources are utilized to bombard the cancer.

Commenting on the development of radioactive cobalt for cancer treatment, Dr. Leonard Scheele, director of the National Cancer Institute until his appointment this month as Surgeon General of the U. S. Public Health Service, said:

"If radioactive cobalt proves to be an entirely effective substitute for radium in the treatment of cancer patients, and we have reason to believe this will be so, it will afford welcome relief to hospitals and medical centers throughout the country."

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safe limits. A maximum safe limit of 10 parts of nitrate nitrogen per million parts of water has been set.



PLANT TISSUES GROW IN CULTURE—Masses of undifferentiated plant tissue can be grown from just a few cells each, taken from tumorous growths on plants known as crown galls. Those shown here were produced from a crown gall of a periwinkle plant, supplied with a nutrient mixture of accurately known chemical composition, in the plant pathology laboratories of the University of Wisconsin, by Prof. A. J. Riker, Mrs. Alice Butsche and A. C. Hildebrandt. They were shown before the recent meeting in Madison of the American Association of Anatomists.

The poisonous effect of the high nitrate water results, Mr. Weart explained, from the conversion of the nitrate into nitrite by bacterial action in the intestine. When absorbed into the blood the nitrite changes part of the hemoglobin, the oxygen-carrying chemical that makes blood red, into methemoglobin. This is an inert chemical that does not transport oxygen to the tissues. The blood becomes chocolate colored and the skin turns slate gray. Although the baby's appearance is alarming, its breathing and circulation may be relatively normal. But if the acute cyanosis persists

general damage and death may occur.

Besides changing the drinking water, treatment of the baby with either a blue dye, methylene blue, or with vitamin C, is said to bring dramatically prompt recovery.

One reason only infants seem susceptible to the ailment is that they have much less functioning hemoglobin than adults. The effect on older babies and children of continuing to take large amounts of nitrates is not positively known, but it may deplete them of vitamin C. Lack of this vitamin results in scurvy.

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a wide field of use in stationary plants as well as in locomotives, he declared. The gas turbine is the first power plant which can exceed 25% in thermal efficiency without using a drop of water. An immediate application will be in supplying power for coal mines, which must now purchase power because they have no water for boilers and condensers. The gas turbine will free the power engineer from bondage to the boiler, and it will enable him to locate his power plant where he wants it, rather than near a water supply.

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One birth in 89 results in twins, one in 8,846 in triplets, and one in 599,921 gives America new quadruplets.

CHEMISTRY

New Food-Saving Varnish

► THE world's first completely synthetic varnish, made from petroleum, promises to add to the world's food supplies by replacing paints and varnishes now made from edible vegetable oils.

The new type varnish prepared from a new petroleum chemical, glycerol allyl ether, was announced to the American Chemical Society meeting in Chicago by chemists from the Shell Development Company, Emeryville, Calif.

Insoluble films, hard to hurt with chemicals and resistant to scratching, are formed by the new varnish. It is made in several chemical steps from propylene gas, which is abundantly available from cracking oil.

Manufacturers are expected to apply the new varnish where they now use resins made from a combination of synthetic materials and scarce natural drying oils.

Linseed oil, soybean oil and cottonseed oil, which can be used as food, have been used as major ingredients up to now of so-called synthetic paints and varnishes. The new varnish is one of several attempts to replace some of the scarce vegetable oils with synthetic products made from more available non-food materials, such as crude oil.

H. Dannenberg, T. F. Bradley and T. W. Evans were the Shell chemists who did the research.

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ENGINEERING

Need for Coal Stressed

► MORE coal from American mines will be needed and the amount will rapidly increase during the next decade, the American Mining Congress was told at its meeting in Cincinnati by Dr. John I. Yellott of the Locomotive Development Committee, Baltimore. The reasons, he stated, are a deficiency of fluid fuels, large coal exports, and the interchangeability from a chemical standpoint of coal, oil and gas.

The major increases in the nation's fuel requirements must be met in some manner from coal, he declared, because the fluid fuels are rapidly approaching the point where their use will be restricted to applications, particularly automotive, to which coal is inherently unsuited, and for which fluid fuels are virtually essential.

Industrial activities are increasing, and

new housing is needed for a growing population. These new demands can not be met by oil or gas, and they must be satisfied by and with coal. Industrial and institutional coal customers can be retained, however, only by improvement both in equipment and in coal quality.

A coal-burning gas-turbine locomotive, now designed after three years of experimental work, was described by Dr. Yellott as one of the improved methods of using coal with a high degree of efficiency. Very finely powdered coal, pulverized on the locomotive, is forced into the combustion chamber mixed with compressed air. It is burned in suspension within an air-cooled combustor, and the heated gases, with fly ash removed, will run the gas turbine, which in turn will drive electric generators.

The coal-fired gas turbine will have