would have a similar action in the bone, including the fission products, columbium, lanthanum, praseodymium, neodymium, element 61, samarium, europium; and the naturally occurring elements actinium and proactinium.

Some of the fission products are slightly less dangerous because they emit lighter beta particles, Dr. Hamilton said. But the actinide series, including plutonium, have the undesirable characteristics of radium in that they have both long half-lives and emit heavier alpha particles.

Dr. Hamilton said that radium is probably less dangerous for comparable amounts of radioactivity, than, for example, plutonium. The reason is that radium is distributed throughout the mineral structure of the skeleton, with the result that fewer alpha particles penetrate to the marrow.

The research was done in collaboration with Dr. Robert S. Stone, professor of radiology in the University of California Medical School, formerly head of the plutonium project health organization, by Dorothy Axelrod, Josephine Crowly, Dr. Harvey Fisher, Henry Lanz, Kenneth G. Scott, Dr. L. Van Middlesworth, Dr. D. H. Copp, Dr. I. L. Chaikoff, Dr. D. M. Greenberg, Dr. Roy Overstreet, Dr. Louis Jacobson, and Dr. Hamilton.

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ENGINEERING

300-Cycle Power for Lights

Would improve fluorescent lighting but must wait for development of frequency converters for homes and offices. Would increase efficiency.

➤ BETTER fluorescent lighting is obtained by the use of higher frequency currents, the Illuminating Engineering Society meeting in New Orleans was told by John H. Campbell of General Electric.

General application will await the development of frequency converters for homes and offices to change the present 60-cycle power into frequencies in the range of from 300 to 600 cycles. The converters will have to be efficient and low in initial cost if the advantages of the new system for operating fluorescent lamps are to be obtained.

The efficiency of light output can be increased about 25% by use of the higher frequency, he said, and the cost of the ballast reduced considerably. The so-called ballast is the choke coil used to control and stabilize the electric discharge in the tube of the fluorescent lamp. The decreased cost in the ballast is due to the fact that with the higher frequencies a ballast weighing only a few ounces can be used, compared with a ballast of several pounds used with the 60-cycle power.

Flashing Fluorescent Lamps

➤ FLASHING fluorescent lamps for street advertising were described at the same meeting by Fred J. Vorlander and Sigmund Stawicki of the Champion Lamp Works, Lynn, Mass. Scientists of this company are credited with developing the first commercially successful circuit for the so-called flashing hot-cathode fluorescent lamps. The cathodes are the electric terminals within the fluorescent tube between which the electrical energy passes to cause the light.

In the device described, the repeating flashes are due to a combination for continuously heating the cathodes with an instant start circuit. The instant start circuit, regularly interrupted mechanically or otherwise, provides sufficient current to start the lamps without aid of a starting switch. Cathode deterioration is minimized by the constant heating of the cathodes.

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ORNITHOLOGY

Test Spraying Shows DDT Harms Small Birds

➤ DDT is capable of great harm to small-bird life in young forest growth when sprayed to check insect pests, it appears from evidence presented before the meeting of the American Ornithological Union in Toronto by Chandler S. Robbins of the U. S. Fish and Wildlife Service.

An oil spray of DDT was applied at the rate of five pounds per acre to a 90-acre tract of five-year-old scrub and sapling growth at Beltsville, Md., just outside Washington, D. C. Afterwards, bird population studies were carried on in a 30-acre plot at the center of the sprayed area and in an unsprayed check area of the same size one-half mile away.

The five commonest bird species, making up more than three-quarters of the entire bird population, suffered an overall 65% loss in the sprayed area. Heaviest losses were to three species, Maryland yellow-throat, prairie warbler and mouse wren, which were cut down by 80% in the sprayed area. The towhee or ground robin suffered a 35% loss. Of the five most abundant species, only the yellow-breasted chat seemed unaffected.

Birds suffer DDT poisoning by eating poisoned insects, and especially by feeding them to their nestling young.

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