

Survey scientists said. It is about 100 fathoms (600 feet) deep there, but begins to slope downward very steeply, reaching a depth of 1,000 fathoms (6,000 feet) within 15 or 20 miles. Earthquakes have been frequent in this general region, but nothing of major importance has been recorded from this particular locality.

The shock was undoubtedly a "world-shaker," for the instruments in the seis-

mological observatory at far-off Wellington, New Zealand, recorded it. Other stations reporting were the Dominion Observatory at Ottawa, Canada; the observatories of the Jesuit Seismological Association at Georgetown University and Weston College in Massachusetts, and the stations of the U. S. Coast and Geodetic Survey at College and Sitka, Alaska, and Tucson, Ariz.

Science News Letter, April 13, 1946

ENGINEERING

Atomic Heat Problem

Thousands of millions of degrees Fahrenheit temperature are reached by individual atoms, but resulting fluid can be handled by already familiar processes.

► ENGINEERS faced with new problems in the utilization of heat from atomic power plants will at least have as a starting point the familiar conditions of heat exchange, it appears from a paper given before the American Society of Mechanical Engineers, by Prof. W. G. Pollard of the department of physics of the University of Tennessee.

Thousands of millions of degrees Fahrenheit temperature are reached by the individual atoms of fission products in an operating atomic pile. But after these have been brought into equilibrium with the coolant, the resulting fluid, heated in the process, can be handled in boilers designed for steam or mercury vapor in processes already familiar.

The problem of bringing the intensely hot particles into equilibrium with the coolant is not unlike mixing one's bath water. The user of atomic energy can, within practical limits, choose the temperature of the resulting mixture, for the fission fragments are at so high a temperature that any man-made temperature will still be cool by comparison.

This intense heating results from collision of atomic particles. The fission fragments are stopped, for the most part, in the metal rod where they are produced. This results, says Prof. Pollard, in an intense heating of the rod, so that arrangements must be made for efficient heat transfer from the rods to the coolant, which is air, water or molten bismuth flowing through the pile where fission is carried on.

"It is possible," says Prof. Pollard, "to heat the coolant to any desired temperature because the fission fragments are liberated in the metal at a temperature of many million degrees Fahrenheit. The hot coolant will be radioactive on leav-

ing the pile but it can be passed through a boiler or heat exchanger to produce steam or mercury vapor at high pressure and then returned to the pile."

Another important aspect of pile design and operation outlined by Prof. Pollard involves protection against radioactivity. Throughout the body of the rods of fissionable material in a going pile small amounts of elements like barium, krypton, iodine, yttrium, etc., are being generated. After coming to thermal equilibrium and collecting some electrons to complete their transmutations, these new elements undergo a whole series of radioactive disintegrations, like radium, before reaching stable forms. Gamma rays given off in this process must be absorbed by the thick screens which must always surround the pile, and this absorption again creates heat and the necessity for cooling.

"The fast fission neutrons," says Prof. Pollard, "are produced at a steady rate in the metal at a temperature of some 10,000,000,000 degrees Fahrenheit. They represent a very dilute but very hot gas which diffuses out into the moderator where it is cooled down by mixing to the temperature of the moderator. As a cool gas it diffuses back into the metal where it can produce more fissions. This represents a true convective heat transfer." The problems of nuclear reactions, the energies involved and the problems of handling radiations are well known in physics, says Prof. Pollard, but have not been generally included in engineering training.

Science News Letter, April 13, 1946

Crab grass, the lawn pest, is an annual and prolific seeder; one plant may produce as many as 300,000 seeds.

HORTICULTURE

Garden Favorites Include Tomatoes, Beans

► IF YOU HAVE a garden, you will probably plant several of the following, depending upon the size of the plot you plan to cultivate: tomatoes, string or wax beans, onions, lettuce, radishes, beets and carrots. Each of these seven vegetables were grown in more than half of the 1945 Victory Gardens, a survey conducted by the Bureau of Agricultural Economics shows.

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American eels are confined to the Atlantic and Gulf coasts and streams.

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