

**DEFECTS REVEALED**

A million volt X-ray picture through several inches of steel looks like a fogged film but the white spray is due to defects in the steel.

sprayed to the side. Ordinarily the direct rays are used, but sometimes the side ones are convenient. The snout can be placed at the center of a boiler and radiographs, as the X-ray pictures are called, taken with a single exposure on a series of films all around the circumference.

The 1,000,000-volt outfit will photograph through five inches of steel in 2 minutes. A tube operating on 400,000 volts, the next size smaller, requires three and a half hours for the same job. Even then, the lower power picture does not show nearly as much detail in the thicker sections. In this way the new apparatus speeds inspection of parts for vital defense machinery, to be used on land, at sea, and in the air.

When a steel casting is found to have a defect, such as an inclusion of slag, the radiograph shows its position; the casting is sent back to the foundry and the defect is chipped out. Then new metal is welded in and the part is again X-rayed. If satisfactory, the construction of the machine is completed.

Even on smaller parts, high-voltage is a help, as the tube can back way from the job and spray a large area with the rays. Don M. McCutcheon, in charge of the X-ray laboratory at the Ford Motor Company, found, with a heavy part des-

tined for a large bombing plane, that at least six exposures were needed for each casting with 400,000 volts, while the 1,000,000-volt machine completely X-rayed six entire castings at once.

Million-volt X-rays were not developed because of the urgent defense activities, but their application has been speeded. A present-day parallel is seen in the way in which the last war made popular the general use of medical X-rays. Still some-

what of a novelty in 1914, doctors called to military service had to use them. They learned their advantages, and continued to use them in private practice after the war.

Now that many industries are being forced to use X-rays by the requirements of defense, they, too, will learn their value, and will keep on using them after the wartime rush is over.

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GEOLGY

Idaho for First Time Enters Mercury Mining Picture

One Mine in Large-Scale Production, One Just Opened, Still Others in Prospect; Some Gold Found With It

MERCURY, vital defense metal, is now being mined on a large scale in Idaho, which until three or four years ago did not figure as a mercury-mining state at all, the U. S. Geological Survey states. One mine, in the Weiser deposits 50 miles northwest of Boise, is already in large-scale production. Another has just been opened, in another ore body some distance away, in the eastern part of the state. Still others are in prospect.

The Weiser ore body has been studied in detail by a Cornell University geologist, Prof. Alfred L. Anderson, who made the examination for the U. S. Geological Survey. His report has just been published by the Idaho Bureau of Mines.

This ore body, Prof. Anderson says, "was discovered in 1937. It aroused much interest, both because it is in an area not previously known to contain metallic lodes and because in the last two years of its operation it has brought Idaho into the list of states that contribute notably to the production of quicksilver."

Mercury is one of the vital defense elements, a key in any munitions program, being used in the detonators of all kinds of explosives, in scientific instruments essential to warfare, and also in drugs and antiseptics.

The United States has been a poor third to Spain and Italy in its production and since the beginning of the war has been cut off from a large part of its previous supplies imported from those countries. This curtailment has been reflected in the price of mercury, which has skyrocketed from \$1.60 to \$2.90 a pound.

The mercury occurs as cinnabar, a sulphide of mercury. This mineral is found impregnating siliceous, opalized rock which resembles red iron ore. The ore is mined from shallow excavations as well as from some subsurface workings and yields 5 to 15 pounds of mercury to the ton. After mining, the ore is ground and heated to drive off the quicksilver as a vapor. The vapor is then condensed by cooling to give the liquid metal.

Dr. Anderson says that the mineralized ground extends over more than 100 acres, but only a fraction of this has been thoroughly explored. He adds that some gold is found in the mercury, but the quantities are too small to be of commercial value.

Other states leading in the production of mercury are: California, Oregon, Texas, Arkansas and Nevada.

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CHEMISTRY—AGRICULTURE

Two New Plants To Make 20 Tons of Starch Daily

CARLOADS of cull white potatoes, a former waste product of farms, will be fed into two new starch plants which started operation in October in Idaho, thereby adding about 20 tons of starch a day to the nation's supplies and bringing \$280,000 a year of new wealth to farmers.

The plants, at Blackfoot and Twin Falls, will use about 19,000 tons of cull potatoes apiece in a year, paying a base price of \$3 a ton plus a bonus.

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