

Results of the test were reported by Alfred Piscatello, crew member aboard the *Angie* and *Florence*. The vessel had circled a school of mackerel in its long net, when sharks were observed circling near. Two blocks of the shark-chaser were sunk to a depth of 20 or 30 feet in a weighted container, and towed around the net. Additional chemical was spread on the water close to the net. The sharks headed for the catch, but when they came to the black "slick" on the water formed by the chemical they hastily turned tail and swam away.

One shark was caught in the net. Ordinarily this would have resulted in serious damage, for a netted shark lashes out furiously in efforts to escape. But this shark was very much subdued and was easily lifted out by hand.

Science News Letter, November 3, 1945

MARINE BIOLOGY

DDT Fails to Check All Ship-Fouling Organisms

► DDT, THOUGH proven able to prevent barnacles from growing on submerged steel plates, is nevertheless of little value as the main active ingredient for anti-fouling paints to be used on ships' bottoms, G. W. Seagren, M. H. Smith and Dr. G. H. Young of the Mellon Institute declare. (*Science*, Oct. 26). They base their conclusions on an eight-month series of experiments on the Florida coast, where the anti-fouling effectiveness of paints containing DDT and the time-honored anti-fouling copper compounds were compared.

In these experiments, as in earlier ones by other workers, the DDT did prove effective in preventing barnacles from taking hold on the steel test panels. The catch lies in the fact that barnacles are not the only organisms that foul up ships' bottoms. Other animals that help to form the troublesome crusts are included in several zoological orders: mollusks, annelids or jointed worms, hydroids, bryozoa and tunicates. The plant kingdom is represented in the growth complex by several kinds of algae or seaweeds. DDT had no measurable effect on any of these, save only barnacles, whereas a conventional-type copper-containing paint was effective against all of them.

The three researchers therefore conclude: "It thus seems unlikely that this toxicant (DDT) can effectively displace cupriferos and/or mercury pigments in the usual ships' bottom paints."

Science News Letter, November 3, 1945

ELECTRONICS

100,000,000-Volt Betatron

Details of this war-secret instrument are now revealed. It gives out X-rays of power never previously approached.

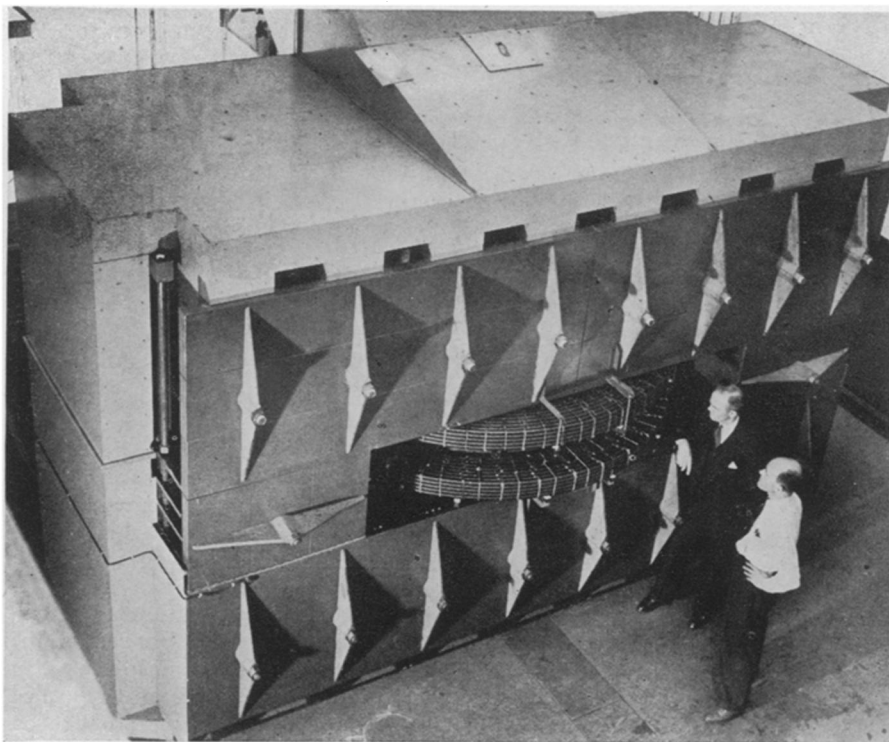
► DETAILS of the war-secret 100,000,000-volt electron accelerator, or betatron, were revealed at the General Electric Research laboratory in Schenectady to a group of newspaper science editors and technical writers who inspected the instrument.

"The new machine gives out X-rays of a power never previously approached," declared Dr. C. G. Suits, director of the laboratory, "and these will penetrate a thickness of metal considerably greater than the rays of our 2,000,000-volt industrial X-ray unit. But even more exciting to us are the possibilities that with the 100,000,000-volt electron stream that produces X-rays of the same energy we can produce other interesting forms of radiation. In fact, we have now arrived at the stage where we can generate in the laboratory radiations which formerly

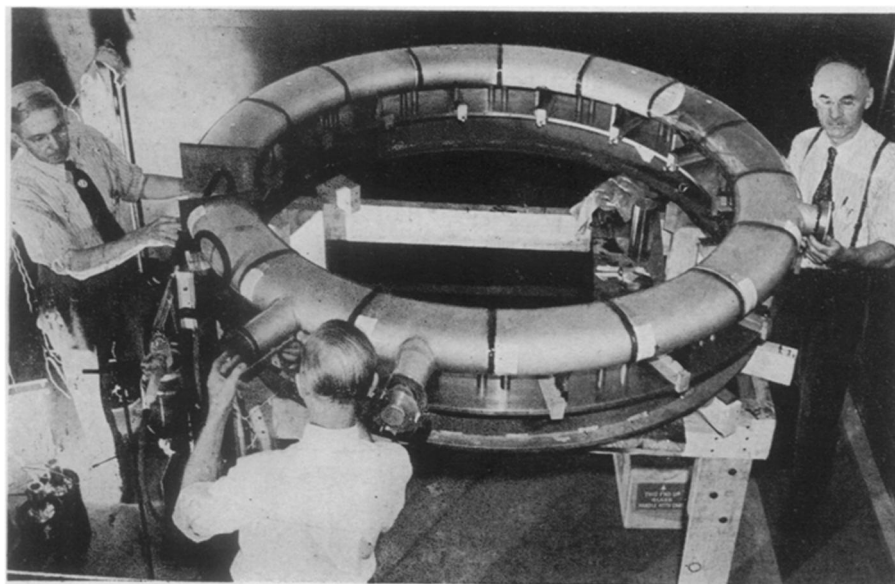
were available only in the cosmic rays, and we are just passing the borders of an entirely new field of atomic research."

The principal part of the betatron is a huge electromagnet, made of 130 tons of laminated silicon steel. In a rectangular opening passing through the magnet from front to back are the pole faces, 76 inches in diameter, surrounded by large coils of insulated one-inch copper conductor. As electric current at 24,000 volts surges through these coils from a bank of condensers, the magnet is energized, the intense magnetic field being concentrated in the horizontal space between the pole faces.

The heart of the machine is a doughnut-shaped vacuum tube of glass. The doughnut has an over-all diameter of 74 inches, while the elliptical tube itself measures eight inches horizontally and



100 MILLION VOLTS—This machine will speed electrons to energies of 100,000,000 volts and produce X-rays of the same power. Dr. E. E. Charlton, left, and W. F. Westendorp are the two scientists at General Electric who have been responsible for the design and construction of this new super X-ray machine.



TUBE IS ASSEMBLED—The heart of the machine is this doughnut-shaped vacuum tube of glass. The doughnut has an over-all diameter of 74 inches, while the elliptical tube itself measures eight inches horizontally and five inches vertically.

five inches vertically. The inner surface of the tube is electrically conducting, so that it will not accumulate a charge that would upset the paths of the electrons within.

Projecting into the doughnut at one point is an electron gun, consisting of a heated filament from which electrons are boiled off. These have an initial impulse of several thousand volts to start them in their orbits inside the doughnut.

The machine operates on ordinary 60-cycle alternating current. Acceleration of

the electrons is confined to the first quarter of each cycle lasting 1/240 of a second, during which the current goes from zero to its maximum in one direction. Then it goes back to zero, before building up in the opposite direction.

Just as the end of the quarter cycle is reached, a pulse of current passes through two smaller auxiliary coils on the pole faces. This causes the electrons to spiral away from their orbit and to hit a tungsten target. This causes the generation of X-rays. (See SNL June 3, 1944.)

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MEDICINE

Anemia Remedy

Newly synthesized vitamin, folic acid, gives a "definite upsurge of well-being" to weak, gaunt sufferers from this robber of red blood cells.

► PATIENTS weak, gaunt and waxy-white, whose blood was thinned to half or less the normal number of red cells, felt a "definite upsurge of well-being" as they gained fresh red blood from doses of a newly synthesized vitamin, folic acid, Dr. Tom D. Spies of the University of Cincinnati reports. (*Southern Medical Journal*, Nov.)

Associated with Dr. Spies in the studies, conducted at the nutrition clinic at the Hillman Hospital, Birmingham, Ala.,

were Dr. Carl F. Vilter, Mrs. Mary B. Koch and Mrs. Margaret H. Caldwell.

The synthetic folic acid which swiftly increased the number of immature red blood cells and brought the count of mature red cells and hemoglobin content towards normal is the first synthetic substance to produce this response.

The discovery of its effect is therefore hailed by the editor of the *Southern Medical Journal* as "another milestone in the study of macrocytic anemia."

Macrocytic anemia occurs not only as pernicious anemia but also with liver disease, pregnancy, sprue and pellagra. Liver and liver extract, dried hog's stomach, kidneys and brain have heretofore been the only substances which remedied this macrocytic anemia. Various B vitamins were tried by Dr. Spies and associates. These included niacin, thiamin, riboflavin, calcium pantothenate, inositol, pyridoxine, para-aminobenzoic acid, choline, pyridoxamine and pyridoxal. They had little or no effect.

Synthetic folic acid may not produce all the results that are obtained by doses of potent liver extract. Further studies may show whether this vitamin is the anti-pernicious anemia material in liver or closely related to it.

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MEDICINE

Nobel Prize in Medicine Awarded for Penicillin

► THE NOBEL prize in physiology and medicine for 1945 has been awarded to Sir Alexander Fleming, discoverer of penicillin, and Sir Howard W. Florey and Dr. Ernst B. Chain, who fathered its development into a life-saving remedy. The story of penicillin has been brought to SCIENCE NEWS LETTER readers beginning with the announcement of its discovery (*SNL*, May 10, 1930), and in numerous other reports such as those in the following issues: Dec. 4, 1943; Mar. 24, 1945; May 29, 1943; July 4, 1942; Nov. 22, 1941.

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SIR ALEXANDER FLEMING