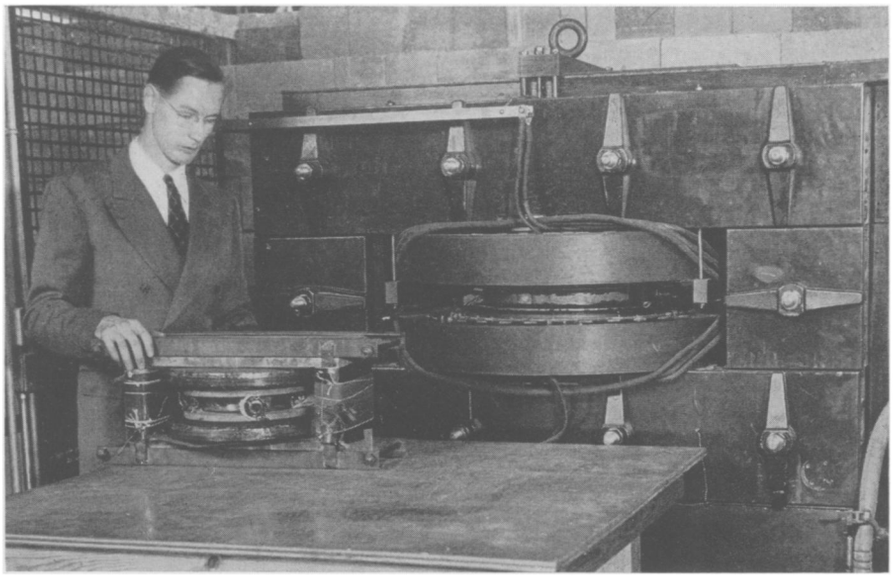

NEW USE—The 20 million volt Betatron shown in the background of this picture has new possibilities in the fighting of malignant growths in the human body. Prof. Donald W. Kerst, University of Illinois, shown holding the first Betatron, built in 1940, has just reported that the electron beam from the instrument may be even more valuable than the high-voltage X-rays produced with it, for malignant growth therapy.

MEDICINE

Betatron for Medical Use

Electron beam, as well as high voltage X-rays may be used in treatment of human malignant growths. No tests yet on living tissue.

➤ THE NEW atom-smashing Betatron, most powerful X-ray in the world, may become a first-rank medical weapon for destroying malignant growths within the body, Prof. Donald W. Kerst, who developed the Betatron at the University of Illinois, told members of the Radiological Society of North America in Chicago.

Mankind's most dreaded disease enemy might be attacked by this new blitz weapon in either of two ways: first, by use of its 20-million-volt X-rays, and second, by using directly the electron beam which makes the X-rays.

The new machine is not yet ready for use in treating patients, Prof. Kerst cautioned, and no tests with it have as yet been made on living tissues. He and his assistants, Philip Morrison and H. W. Koch, have, however, measured the penetration of the X-rays and electron beams through material equivalent in absorbing power to tissues. These tests show that, unlike the 400,000 volt X-ray machines now used to attack malignant growths, the rays from the Betatron would produce their maximum effect about one and one-half inches below the surface of the body instead of at the surface. This means that the killing rays would have little effect on the skin and fat beneath it, but would deliver their full blitz effect on growths within the body.

"Sending the electrons directly into the patient is the most promising way to use the Betatron for therapy (treatment)," Prof. Kerst said. "At 20 million volts these electrons will penetrate as far as 10 centimeters (about four inches) and no farther. Thus there is no damage beyond the area of treatment."

The Betatron, developed as a high-voltage atom-smasher for research in atomic physics, is a compact machine and relatively inexpensive for the voltage produced. It is about the size of an office desk, and has a control panel and condenser bank, each of about the same office desk size, and a motor generator. It is thus smaller than many X-ray machines of considerably less voltage now in use and requires about the same amount of power for operation.

The Betatron described is the second of its kind. Prof. Kerst built the first one over two years ago in his laboratory at the University of Illinois. This one was built under his direction by the General Electric Company.

Science News Letter, December 12, 1942

ENGINEERING

Research Saves War Metals; Aids Sub-Zero Operations

➤ MORE THAN 10 million pounds of nickel, chromium and molybdenum will be saved next year in the production of medium tanks alone, through engineering research of the Society of Automotive Engineers' War Engineering Board, it is reported in the December issue of the organization's technical journal.

Cooperation of industry and the military, through research sponsored by the Board, is expected to produce other large savings. Materials conservation is now being incorporated in the designs and specifications of new army equipment.

Use of low-grade metals is being expedited to release the better alloys for more critical uses.

Recent piece-by-piece study of military motor vehicles, conducted by the Board, involving thousands of parts, reduces consumption of vital materials, such as rubber, aluminum and cork, and utilizes suitable substitutes.

Development of cold-starting aids for military motorized equipment is among the current projects, the journal reports. Sufficient progress has been made to supply the Army with satisfactory expedients for this winter. Plans under way are expected to make American armed forces the world's best equipped for sub-zero operations.

Other research projects contemplate development of equipment for the American army and navy which will assure satisfactory service in any climate in the world, with both production and servicing using a minimum of materials.

An "interim" secondary butyl tire has been developed by a committee created by the Board, which appears capable of 15,000 miles of service and satisfactory for synthetic recapping materials. Manufacturers are cooperating in laboratory and field tests with the idea of making the material available for use in 1943.

Science News Letter, December 12, 1942