MEDICINE

First Betatron Treatment

20,000,000 volt X-rays were used on the first human cancer patient to be treated with the atom-smasher. The method holds hope for others, doctors stated.

➤ FIRST USE of the atom-smashing betatron in the treatment of a human cancer patient is announced by an 18-man corps of doctors.

The patient who was the first to be treated with 20,000,000 volt X-rays was a 27-year-old student suffering from glioblastoma. This is a malignant brain tumor. The young man had been operated on and given a course of conventional X-ray treatments without success.

Unfortunately, he died a month after the betatron treatment. But from the experience with his case the doctors conclude that "the betatron offers good methods for tumor regions of any shape and in any position in the human body."

An increased number of cures of deep-seated tumors and decreased cases of radiation damage should, the doctors think, result from use of the betatron.

The 18 doctors from the University of Illinois, the Carle Hospital Clinic of Urbana, Ill., and the Tumor Clinic of Michael Reese Hospital in Chicago, spent about 2,000 man hours in the treatment of this case. In their report to the AMERICAN JOURNAL OF ROENTGENOLOGY AND RADIUM THERAPY they state:

"It seemed that the man had a small but not entirely negligible chance of cure if treated with the betatron. The moral issue was simple. We could let the patient die without disturbing him further, or he could be given a last chance. This could be done without much inconvenience either to him or his family. There was little doubt as to which decision to make.

"As there was no other betatron available for clinical work at the time, it was proposed to use the 22 mev. (million electron volt) machine at Urbana. The University authorities cleared the machine for use in this one case, and the staff of the Carle Hospital Clinic accepted the medical responsibility."

The task of the doctors was to co-ordinate the miscellaneous relevant information and to perform additional tests until one coherent method developed out of the various details. There were recognized risks in the use of 20,000,000 volt roentgen rays from the betatron and these had to be minimized.

"With high energy rays, it is possible to treat any region anywhere in the body with high doses without reaching dangerously high levels outside the predetermined region," the report continued. "It is feasible and it may be desirable in selected cases, to achieve a caustic or almost caustic effect in the depth. With low energy equipment, this can be done only in accessible regions of the body.

"For our patient, treatment with high doses to a restricted area was clearly the only possibility. He had previously been given a course of roentgen (X-ray) treatments with large fields and medium dose, with negative results. These treatments had produced radiation sickness, without any evidence of tumor response.

"Glioblastomas are often not radiosensitive, and the particular one with which we were dealing had already proved that it was not. Hence, the only remaining chance to control it was the administration of very high doses.

"We restricted our attention to that part of the potential tumor-bearing region which we felt we could destroy without incapacitating the patient."

The method of treatment required accurate positioning of the head. This meant elaborate and painstaking advance preparations through the use of an exact plaster model of the patient's head and the production of two molds to hold his head in exact position.

The patient's body had to be rotated easily about the center of the tumor. A steel platform was built and made to pivot. A method had to be devised whereby the head rest, with the plaster head in place, could be aligned so that the central ray impinged upon the selected meridian and passed through the center of the tumor region.

Every step of the betatron treatment was first worked out with the head replica so that there would be no mistake. The radiation limits were fixed so that no live and healthy tissue would be touched.

During the first week of the treatment, the patient showed slight but definite improvement. There was no sign of radiation sickness. In the second week, he developed weakness and the radiation treatment was stopped. Lung congestion developed before he died.

Science News Letter, June 25, 1949

NUCLEAR PHYSICS

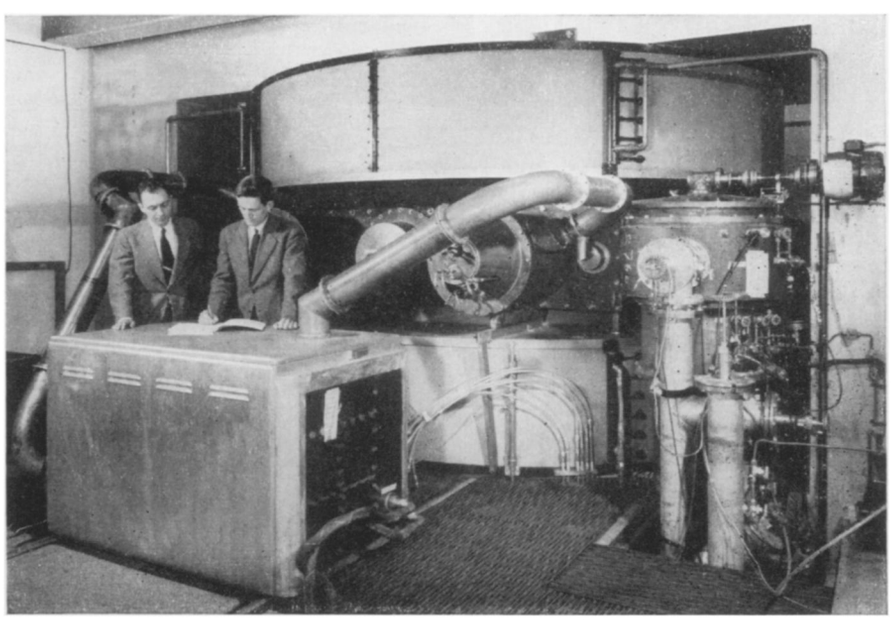
"In-Between" Atom Smasher Is Unveiled at Harvard

➤ AN "in-between" atom smasher has been unveiled at Harvard University.

The new 800-ton synchro-cyclotron is uniquely valuable, it was explained, because it is bigger than small cyclotrons, but smaller than the giant new ones underway or completed elsewhere.

The Harvard cyclotron boasts a top energy of 125,000,000 electron volts. It is the only one built or planned in this country that falls within the range from 30,000,000 to 200,000,000 volts. Thus, physicists may be able to make important studies with this new atom smasher, filling gaps between researches with the smaller and larger cyclotrons.

Science News Letter, June 25, 1949



"IN-BETWEEN" ATOM-SMASHER — This is Harvard's new synchro-cyclotron which is the only machine built or planned in the area between 30,000,000 and 200,000,000 volts.