ENGINEERING

MIT Demonstrates Reactor

A $3,000,000 reactor, built as a facility for research and training nuclear engineers, is in operation together with an unusual medical therapy room.

See Front Cover

➤ NEW ENGLAND'S first atomic reactor produced its first isotope in a demonstration at the Massachusetts Institute of Technology research plant.

The first isotope was produced in the reactor during a press tour by lowering a sample of iodine into the exposure zone of the reactor. The iodine was converted to radioactive iodine-131.

The reactor was built for "tame" atomic energy use. Operators at the control board demonstrated how the splitting of atoms in the uranium-235 fuel can be stepped up until a self-sustaining chain reaction is achieved and how the reactor can then be shut off.

The reactor, which cost $3,000,000, will be operated only at low temperature and not for the production of power, Dr. Theos J. Thompson, director of the reactor and professor of nuclear engineering at MIT, explained. Primarily it is a facility for research and training of nuclear engineers.

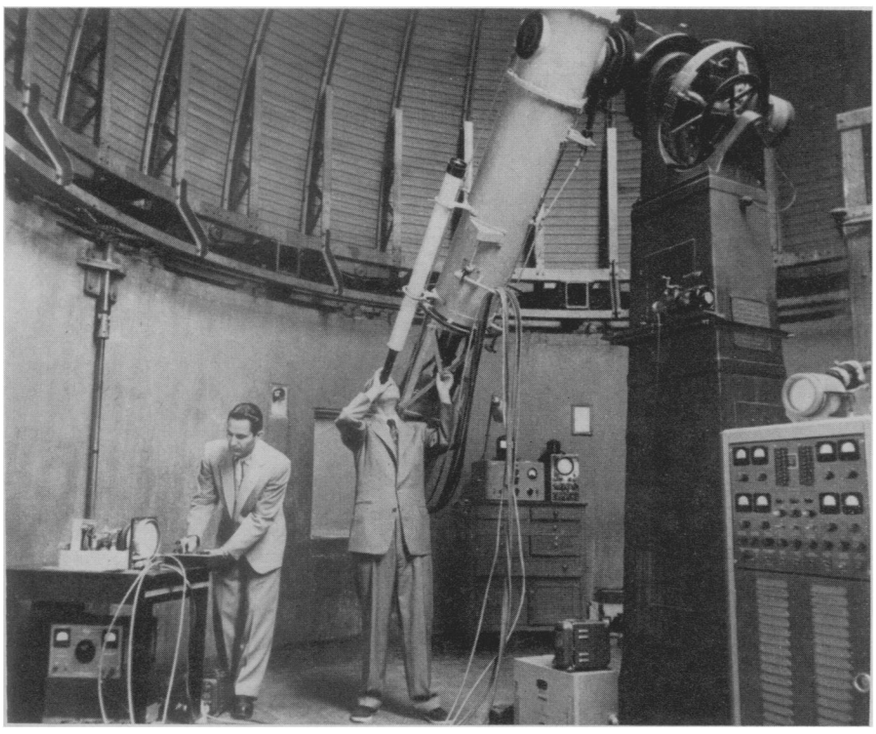
A unique feature at MIT is the medical therapy room located beneath the reactor core that will provide facilities for the treatment of brain tumors to doctors of the Boston area.

The photograph on the cover of this week's SCIENCE NEWS LETTER is a posed picture demonstrating how cancer therapy can be practiced with nuclear energy. The patient-model's position is directly under the neutron beam opening to the reactor core through which the operator in the foreground controls irradiation from the reactor.

Although medical treatment and research will be important phases of the reactor program, there will be many other uses. It will serve as a laboratory for training engineers and scientists in the newly established Department of Nuclear Engineering at MIT. It will be one of the most versatile research facilities at MIT and will be employed in the wide range of research in the fields of physics, biology, metallurgy, mechanical engineering and food technology.

The reactor has been described as a "cool" or "tame" type, since it will operate at a temperature of only 104 degrees Fahrenheit, about that of a warm bath. Unlike power reactors, in which the heat is converted into electricity, heat from the MIT reactor will be deliberately dissipated through the cooling system. The principal product of the atomic reaction in the reactor will be radiation, especially slow neutrons, to study the structure of crystals, the testing of metals and other materials, and X-ray research.

Science News Letter, August 16, 1958



SHOOTING THE STARS—Radames K. H. Gebel, Wright Air Development Center, hooks the telescope to the "cat eye" equipment while Prof. Lloyd Wylie (right), head of the astronomy department at Wittenberg College, adjusts the telescope. The Center is conducting extensive studies in daylight photography of stars and planets. They are using the facilities of the College Observatory at Springfield, Ohio.

ENGINEERING

Noise Used to Stop Noise for Army

➤ EARPHONES developed by the Army's Signal Research and Development Laboratory, Fort Monmouth, N. J. and the Radio Corporation of America engineers in Camden, N. J., are able to eliminate almost completely background noises, artillery fire and airplane engine roar by creating new noises to fight the unwanted sounds.

To improve communications and increase safety, Army scientists built tiny microphones into the earphones. The microphones create a second noise, just as loud as the unwanted sounds but opposite in phase. When the new sound waves hit the old sound waves, they cancel each other.

ASTRONOMY

Planet Studies Advanced Using Electronic "Cat Eye"

➤ PLANET STUDIES, including the possibility of detailed studies of the mysterious markings on Mars known as "canals," will be advanced through use of the "cat eye."

This device is an electronic system that operates on principles similar to television and contains an optical amplifier 1,000 times more sensitive than that of an ordinary camera. Use of the "cat eye" enables astronomers to take previously impossible daylight photographs of planets and stars.

The electronic system was developed by Radames K. H. Gebel of the Air Force's Wright Air Development Center. Details concerning the device are expected to be declassified soon, and astronomers working to develop an all-purpose image amplifier hope to be able to test the system.

When used with a ten-inch refracting telescope, the cat eye permits very short photographic exposures during daylight or darkness. It is about 10,000 times faster than the best photographic film.

By electronically varying contrasts between light and dark, the cat eye detects very small differences in light that are not apparent with conventional photographic equipment.

The device might therefore be extremely valuable in detailed studies of a planet's surface, since it can measure small differences in contrast. Mars, for instance, has extended regions of slightly different colors.

Photographs of the moon and planets are shot at a twenty-fifth of a second. They are equally and often more revealing than conventional telescopic photographs that require exposures up to several minutes.

Science News Letter, August 16, 1958