BIOPHYSICS

# Atom Smasher for Cancer

**High-powered linear medical accelerator to strike at deep-seated cancer without injuring overlying tissues being developed at Stanford University.**

➤ TREATMENT OF deep-seated cancer with high energy X-rays in every hospital in the nation is the hope of Stanford University scientists who are now building a medical electron linear accelerator in the Microwave Laboratory at Stanford.

The medical atom-smasher will produce an X-ray beam of approximately 6,000,000 volts peak energy. Such a beam, unlike ordinary X-rays, will penetrate to cancerous growth deep in the body without injury to overlying skin tissues. In addition, the apparatus will be compact, flexible and relatively inexpensive.

Two research grants totalling $63,000 have been awarded for the project by the American Cancer Society and the National Cancer Institute of the U. S. Public Health Service.

Construction of the medical accelerator became feasible as a result of research financed by the Office of Naval Research. The ONR contracts put Stanford scientists to work developing linear electron accelerators for use in physics research as well as for medical and industrial applications.

The work will be directed by two Stanford scientists, Prof. Edward L. Ginzton, director of the Microwave Laboratory, and Dr. Henry S. Kaplan, head of the radiology department at Stanford University School of Medicine in San Francisco.

The medical accelerator will be a smaller, modified version of the ONR-sponsored billion-volt linear accelerator now nearing completion at Stanford. It is expected to push electron particles up into the range of the highest speeds ever attained—better than 185,000 miles per second, or 99.7% of the speed of light. The result will be an atom-smashing beam of electrons equivalent to about 6,000,000 electron volts.

By shooting the beam through a plate of heavy metal, such as tungsten or gold, it can be converted into high-energy X-rays. At this level of intensity the X-rays will reach deep into the body of a patient.

X-rays, through the process of ionization, cause electrons to break away from the atoms of cells which comprise the body tissues. These electrons, migrating within the target area, set up chemical changes which result in destruction of the cancer tissue. Cancer cells, being more susceptible to the X-ray ionization than the cells of healthy tissue, are either badly mauled or demolished.

The scientists thus hope to destroy brain tumors and other deeply imbedded cancer tissue. At the same time the rays will cause relatively little injury to surrounding healthy tissues.

Conventional X-ray equipment, on the other hand, is most effective in treating cancer on or just below the skin surface. When used for deeper penetration, it may cause X-ray sickness or damage to the healthy tissues it must pierce.

Because of the huge power supply needed to activate the electromagnetic fields that produce the beam in existing types of high-energy X-ray systems, they are large and unwieldy. The linear accelerator operates on a different principle and does not require this heavy power input.

Science News Letter, July 26, 1952

TECHNOLOGY

## Rubber Lifeboat Insures 70-Degree Temperature

➤ A RUBBER lifeboat that insures a comfortable 70-degree temperature for 15 survivors in either arctic or tropic waters and can be inflated in 30 seconds has been demonstrated by the U. S. Navy and Coast Guard at Floyd Bennett Field in New York.

The weather protection is maintained in either sub-zero or blistering tropical temperatures by dead-air space insulation in the boat's canopy and floor liner. In dangerous cold, this insulation holds the radiant body heat. In the tropics, the liner can be removed to take advantage of the cooling effect of water against the bottom of the boat, while the canopy gives protection from the sun.

The lifeboat was developed and designed by B. F. Goodrich Company of Akron, Ohio, and the Navy's Bureau of Ships. Half a minute after hitting water in a recent demonstration, the new boat had automatically shed its carrying case, ballooned itself into shape with carbon dioxide and raised the protective canopy. The boat, with survival equipment including 50 pounds of canned drinking water, de-salting kits and 30 pounds of rations, is about the size of a small steamer trunk when deflated.

Science News Letter, July 26, 1952

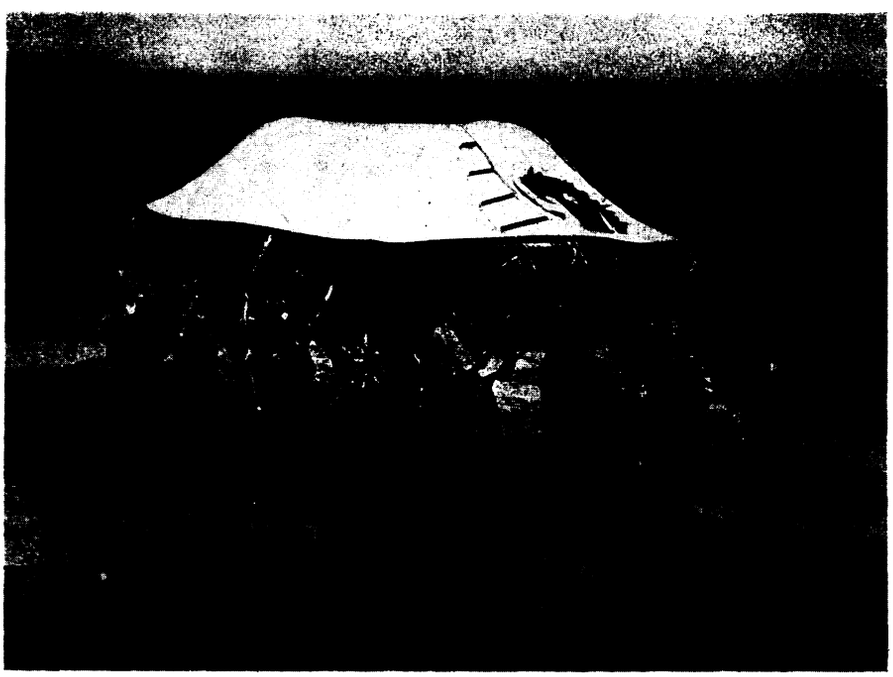
OPHTHALMOLOGY

## Cortisone in Eyes Checks Infection

➤ CORTISONE IN your eye can be more than a mere medical toast to alleviate inflammations and stop destruction of eye structure.

Drs. Max Fine and Rufus C. Goodwin of the Stanford University School of Medicine, San Francisco, report in the *Archives of Ophthalmology* that local administration of the anti-arthritis drug can hold many eye infections in check until wonder drugs or nature produce a cure.

Science News Letter, July 26, 1952



***SPEEDILY SELF-INFLATED—In 30 seconds, this new life raft can inflate itself to give 70-degree protection for the 15 men, shown carrying the 230-pound boat.***