X-Ray Beam Has Shape Of A Pole

By Howard W. Blakeslee

The University of Illinois College of Medicine for at least a year has been using a beam of x-rays in the shape of a pole.

This is something new in beams of any kind. Other beams are fan-shaped. This beam is used to treat cancer and comes from a betatron, a new high-energy electrical machine producing 25,million volt x-rays.

The rays are invisible, but photographic film reveals their peculiar formation.

The betatron is a box, higher than your head, sheathed in metal. Shoulder high on the betatron face is a round hole, big as your wrist, none of the inner works visible. A yard in front of the hole Dr. John S. Laughlin sets up a target, a sheet of photographic film.

When the film is developed it shows a round black disc, the same size as the hole in the betatron's face. The edges of the black spot are shaped as if cut by a knife. The x-rays went through bunched, as rigid as if they had the form of a long, round pole.

Thit betatron beam reaches a cancer with the accuracy of a surgeon's knife. The rays drive so hard that they pass through skin and surface tissues without causing much damage. As they hit the tissues the rays produce electrons, but these too travel so hard and so fast that they cause little surface damage.

The greatest burning effect is deep below the skin. This makes the pole-shaped beam a new cancer tool.

Aiming this invisible beam is difficult. The target is an unseen place inside the body. The bullets are invisible. Only the patient can be in the room when the betatron fires.

Models of the cancer patient have to be made for aiming. To date marksmanship has been only on heads and necks. The model heads are exact reproductions of the patient's lines and contours, perfect enough to be prize-winning sculptures. The model is set in the position the patient will occupy, and surveying fixes this position down to the smallest fraction of an inch.

Phantom heads are made of scores of thin layers. Between each layer is a sheet of photographic film. The beam is shot into this phantom, and the film records the x-ray strength and damage at every depth.

The patient sits or lies in the measured position. He feels no pain, in fact he doesn't feel the ray at all. But he cannot wear a collar button. He must not wear his glasses. Because either metal might become radioactive.

Occasionally when these 25-million volt rays strike something they are captured somewhat like a billard ball in a corner pocket. In this capture they often transmute the atoms they strike. This is the same transmutation as done in atomic piles, and creates the same kinds of radioactivity.

Because of this the walls of the betatron room are covered with materials that do not transmute readily. This induced radioactivity is no risk to the patient, but could interfere with the accuracy in the instruments.

Dr. Roger A. Harvey, radiologist in charge of treatment, refuses predictions. Four persons have been treated. The first was at the University of Illinois, Urbana, where Dr. Donald W. Kerst, inventor of the betatron, has several of these machines. There a 22-million volt beam was focused on a deep brain cancer upon which conventional x-ray surgery had failed. The patient died of another cause before the treatment was completed, but an autopsy showed the cancerous tissue almost completely destroyed, without apparent damage to surrounding tissues.

When drama was first televised in 1928 by WGY, an experimental station in Schenectady, N. Y., only the heads of the actors showed on the screen because of the limitations of the TV medium at that time.

Modern, and Comfortable Waiting Rooms Are Feature Of New Building

This is one of the two new waiting rooms in the new wing of the Hospital. Attractive decorations, together with modern and comfortable furniture are features of both of the rooms. (Mountaineer Photo).

Drug Is Effective In Treatment Of Arthritis

This is the story of two miracles. The first miracle was the discovery of the quick curative effect of a new drug. The second miracle concerns the production of that drug.

Four years ago, in the fall of 1948, a young woman suffering from rheumatoid arthritis seemed to be an incurable patient, at the Mayo clinic in Rochester, Minn. She could scarcely move in bed without extreme pain. Her physician had tried every known remedy to relieve her distress, and was waiting for a new drug being prepared by an eastern manufacturer. The day it arrived he injected a dose into her arm. There was little change during the first 24 hours. After the second dose the suffering woman's pain began to ease away, and the swelling of her joints began to subside. Five days after the first injection, she eagerly got out of bed and went to town for a three-hour shopping spree, about the happiest woman in America.

That was the first test of the new drug, cortisone. The remainder of the first sample was administered to 13 other patients, including some who suffered from rheumatic fever. The results were apparently as miraculous in all cases.

The second miracle concerned with cortisone is credited to the chemical industry. When Dr. Lewis H. Sarett, research scientist on the staff of Merck & Co., was asked how he had known what to do in carrying through the 37 precise chemical steps that enabled him to produce the first sample of cortisone for the Mayo clinic, he replied that he must have been guided by the "Master upstairs".

That same guiding hand seems to have directed events that followed. Never before had the pharmaceutical industry been faced with such stupendous problems. No commercial produce in their line had required 37 chemical reactions. The basic material utilized bovine adrenalin glands. It took the glands of 40 cattle to produce a single dose of medicine. The number of cattle slaughtered in the United States is about 18,000,000 a year. Continued clinical tests revealed that so many more diseases would be helped by cortisone that it would be needed for approximately 20,000,000 people daily.

The ethical drug industry accepted this unprecedented challenge promptly. In doing so they presented an extraordinary example of how American free enterprise and the incentive of our Patent System works, according to National Patent Council.

All of those first basic patents held by Merck & Co., and several others, were placed for administration and license in the hands of Research Corporation, a New York nonprofit organization that functions to advance scientific discoveries. Copies of patents granted are available to the public. Methods and processes are fully disclosed.

Thus, there was no need for others to waste precious materials and effort to work over ground that had already been covered and revealed in the patents. From this advantage a dozen or more firms entered the race to invent and patent improved methods of producing cortisone so that it would become available to all at a price within reach of all.

Research projects to achieve these ends extended in many directions. The primary objective appeared to be toward a more available basic material than cattle glands. The cortison hormone was stripped down to its naked elements, and one last atom of oxygen stood as the most obstinate to adjust to its proper place in the molecule. The search carried five separately sponsored expeditions to Africa to find a certain vine. They found the vine, but it proved worthless. A Chicago firm made progress by keeping the adrenalin glands alive for hours to furnish more of their precious product.

A Harvard professor, working under a grant by a private firm, developed a synthesis for cortisone from a petroleum base. Other basic materials found adequate to sidestep animal glands included yeast, yams, egg yolk, and wool fat.

The result of all this exploration is that new multi-million dollar factories were constructed for the production of cortisone. It was promised that the miracle drug would be in full production by the end of 1952 so that the millions who needed it would be able to get it at a price they could afford to pay. Where else but in America, with its superior Patent System, could be found the incentives to accomplish such a miracle against such odds in so short a time?

Spinach Is Good Only For Popeye

By International News Service

LONDON—A British doctor says there is no reason why children should eat their spinach—no matter what spinach is supposed to do for Popeye the Sailor.

Dr. Charles Hill, parliamentary secretary to the British Food Ministry, told the Royal Society of Arts in London:

"Spinach used to be considered a wonderful source of iron and many a child was forced against his will to eat this rather bitter vegetable, which had little appeal to him apart from its valuable properties as maker of a particularly satisfactory mess.

"It is not an energy f none of its properties c anyone an immediate supp ergy for a sudden d strength."

Theodore Roosevelt w youngest man ever to beco ident of the United State 42 when he first took offi