PHYSICS

New Device Lessens Danger From Treatment with X-Rays

Apparatus Developed at Bureau of Standards Enables First Uniform Measurement of Roentgen-Ray Intensity

THE DANGER of burns during X-ray treatments has been greatly lessened according to Dr. Lauriston Taylor of the U. S. Bureau of Standards, by the completion and final testing of apparatus designed to measure the intensity of X-ray doses.

"Until now, no exact and uniform measurement of the strength of X-rays has been possible," it is explained by Dr. Taylor, who has just returned from Europe with the primary X-ray standard which he designed for the United States. "Now a doctor may calibrate his apparatus to learn the intensity of his X-ray doses without the necessity of guesswork. He will not burn his patient, nor will he commit the worse crime, in cases such as cancer, of undertreating him."

Experimented Abroad

According to Dr. Taylor, there are two factors in X-ray treatment, the intensity and the penetrative power of the rays. The rays' penetrative power depends on the shortness of its wavelength, longer waves having a burning effect. The intensity of the X-ray dose is more important, and it is this intensity which he can now measure.

For three months Dr. Taylor experimented in European national standardizing laboratories, consulting foreign scientists and comparing his apparatus with theirs. Before that he labored at his instruments in the Bureau of Standards in Washington, D. C., to construct a portable X-ray standard, finally building one which is so simple that he could take it with him, and so accurate and dependable that it is designated as the primary or final standard of the United States. This he compared with foreign instruments, drawing up with European scientists specifications for an international standard to remedy international confusion. This new apparatus is the only one in the world that completely satisfies these specifications, Dr. Taylor says.

Uncle Sam's X-ray yardstick is in reality a small metal chamber into which X-rays are projected in a steady, uniform beam. When the rays pass through the air in this chamber they ionize the air, that is, set loose free electrons. This causes the air to become a partial conductor of electricity, which may be measured by an electric current and meters. The strength of this current depends on the strength of the X-rays.

France, Dr. Taylor said, had been comparing X-rays with radium emission, but the X-ray intensity as thus measured varied with the ray's wavelength. The English laboratories did not guarantee steady and uniform transmission of the ray being gauged. The American apparatus does away with both difficulties, and furnishes as nearly as possible a means for transmitting, maintaining and measuring a ray of uniform and standard intensity independent of all other conditions. For this reason France, Egypt, and several other countries have adopted Dr. Taylor's specifications outright, and other countries have drawn up specifications which at present his apparatus alone fits.

"It is now up to the Bureau," Dr. Taylor said, "to find a means for gauging exactly the penetrative qualities of the various X-ray wavelengths. The intensity of a ray used in medical treatment is but half the problem. Not until we have both standards can we call our standardization work complete."

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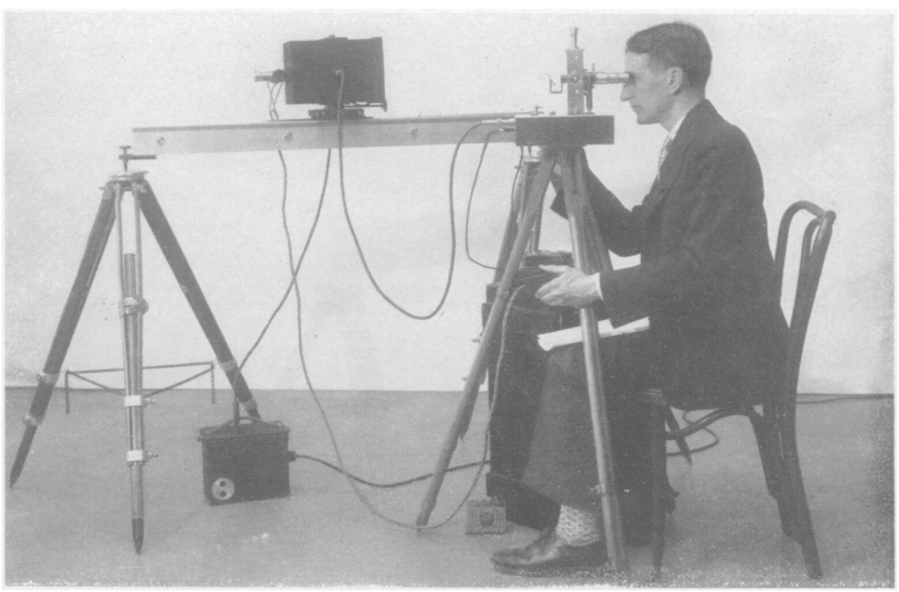

MEASURING X-RAY INTENSITY

One of the newest of the primary standards of the United States, an apparatus for measuring X-ray intensity. Its "birth" was celebrated by a tour of Europe with Dr. Taylor of the Bureau of Standards, for comparison with foreign apparatus in an attempt to make uniform the delicate measurements necessary in cancer treatments.

RADIO

Radio Reception Improves As Sun Spots Decrease

RADIO RECEPTION is getting better, and it will continue to improve during winter months, attaining conditions which have not been duplicated since the great improvement in radio receivers and the advent of the high-powered transmitting stations of recent years.

This is the observation and prediction of Dr. Harlan T. Stetson, director of Perkins Observatory of Ohio Wesleyan University, who has made careful studies of the relation between sunspots and radio reception.

Dr. Stetson says that during the past six months, from March to September, radio reception improved 400 per cent. During the same period sunspot activity became less, the sunspot index for September being only half its March value.

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