

ROENTGENOLOGY

**Million-Volt X-Ray Tube
Soon To Be Ready for Use**

See Front Cover

AN ELECTROSTATIC generator capable of producing ultra-powerful X-rays at a potential of one million volts, expected to be the most powerful tool science has for cancer treatment, was announced before the American Roentgen Ray Society by Dr. Richard Dresser of the Huntington Memorial Hospital, Boston, where the equipment is being installed.

Designed by Dr. John G. Trump of the Massachusetts Institute of Technology, the new generator has two advantages over existing equipment. First, the more penetrating high voltage rays are better able to treat deep seated malignancies. Second, high voltage rays are more specific in their action in diseased tissue than the relatively low ones.

The new generator's tremendous power is indicated by Dr. Dresser's prediction that it will be able to produce a greater intensity of gamma rays than the combined output of all the available radium in the world.

Nearly 15 feet on a side, it appears like a giant mushroom of polished aluminum. Its operation is similar in principle to the generator of Dr. Robert Van de Graaff of M.I.T., in that both are essentially belt conveyors of electricity. It is expected to be ready for operation late this winter.

Science News Letter, October 17, 1936

PHYSIOLOGY

**Wind Does Not Burn, Tests
In Wind Tunnel Show**

WIND alone does not burn the skin. Cases of windburn, so-called, are really cases of sunburn in which the wind has helped the sun along by making the skin more susceptible to the ultraviolet rays of the sun. Wind-tunnel experiments supporting this belief are reported by Dr. W. H. Crew of New York University and Dr. C. H. Whittle of Addenbrooke's Hospital, Cambridge, England (*Science*, Oct. 2).

In one of the experiments, one of the investigators exposed his forearm to the blast of a 40-mile per hour wind in an experimental wind tunnel. The forearm was covered by automobile tire inner tubing except for a small area about one inch square where the rubber was cut away, leaving the bare skin exposed to the blast. No ultraviolet light

was present to reach the bare skin.

"During the half-hour exposure to the blast the skin exhibited 'goose-flesh,'" the report states, "but at no subsequent time was there the slightest evidence of reddening or chapping of the exposed area of the skin."

Cases of wind having caused burning of the skin are due, in their opinion, to the wind's having made the skin more susceptible to the ultraviolet rays by changing the temperature and moisture of the skin and by suppressing perspiration. Perspiration, they found in other experiments, can provide some protection from the actinic rays of sunlight.

Science News Letter, October 17, 1936

PHYSIOLOGY-PSYCHOLOGY

**Wide Difference Found in
Ability To Judge Loudness**

THE NEXT time your neighbors turn up their radio and give the apartment house, or area, in which you live the benefit of their chosen program, pause a moment before you make the statement, "How can they stand it so loud!"—or something worse.

Maybe the neighbors are among those individuals who differ greatly from you in their sensitivity to sound and in their judgment of sound intensity. What you may consider, and perhaps rightly, a very loud sound may to them be merely a pleasing loudness.

New findings by scientists at the Bell Telephone Laboratories show that people have a sound intensity threshold, or lower limit of hearing sensitivity, which may vary as much as one-fifth of the total auditory range. Technically the threshold range for a 1,000 cycle note amounts to a spread of 25 decibels.

Still more widely varied is the individual judgment of loudness of a sound, it was found. From test observations on people who had no prior experience in acoustics or sound measurements, J. C. Steinberg and W. A. Munson found that the variation might be as great as one-third the whole audible range. For scientists it can be explained that the range on a 1,000 cycle test note was 45 to 50 decibels.

In their report (*Journal, Acoustical Society of America*, October), the scientists describe the experimental equipment employed to make possible the comparison of sounds as to their loudness and the efforts made to allow the use of observations coming from a group of 100 test subjects of varying ages.

*Science News Letter, October 17, 1936***IN SCIENCE**

CONSERVATION

**All Shooting Barred On
Canvasback and Redheads**

CANVASBACK and redhead ducks, prized by sportsmen and gourmets alike, are now on the Government's "fully protected" list. Shooting of these species is barred at all times, and the U. S. Biological Survey is making a strong effort to see that the new regulation is effectively enforced.

This step has been made necessary, explained Ira N. Gabrielson, chief of the Biological Survey, by the havoc wrought in the birds' breeding grounds, first by drainage and breaking up of the land for cultivation, and during the past few years by the added intensive effects of drought.

The principal breeding ranges of both species are from north central Nebraska up into the Canadian prairie provinces, and over a wide area extending from interior British Columbia southward and westward to the California coast.

Many of the ducks from the first of these two regions fly across country to winter feeding grounds along the eastern coast of the United States. Hunters who have seen the vast "rafts" of canvasback on the Susquehanna Flats of Maryland have wondered why shooting should be stopped, in the face of such an apparent abundance of birds. Mr. Gabrielson explains that the 200,000 ducks shown on the Susquehanna Flats census represent a heavy percentage of all the canvasbacks and redheads left in the world, and that if sportsmen want any of them to shoot in future years it will be necessary to save them now.

Science News Letter, October 17, 1936

INVENTION

**Horses This Winter May
Have Rubber Overshoes**

NON-SKID horseshoes are now being perfected, to give horses a firmer grip on slick pavements in bad weather. Latest models are of drop forged steel, rubber covered, and have the added advantage of giving the horses far more quiet tread than old-style footwear.

Science News Letter, October 17, 1936

E FIELDS

PALEONTOLOGY

120,000,000-Year-Old Fish Found in a Rock in Texas

A FOSSIL deep-water perch, first of its kind to be found in North America, has been received by the museum of paleontology of the University of California. The specimen was found near the town of McKinney, Texas, by W. W. Pruett. It was in the center of a limestone rock dug from under the foundation of an old monument. Breaking of the rock revealed the specimen.

The appearance of the specimen is similar to that of the present-day perch, except that it was a marine fish living in deep waters. It was about six inches in length, and was a swift swimmer. Living relatives can be found today off the coast of Europe.

The specimen, which belongs to the Cretaceous geologic period of about 120,000,000 years ago, helps to complete the picture of marine life as it then existed off the coast of this continent, according to C. J. Hesse, research assistant in the museum.

Fossil fish of the same geologic epoch have been found in abundance in western Kansas, Mr. Hesse said. But they are mostly near-shore fish. The present discovery is one of the few deep-water fish of the period to be found in North America.

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RADIO

Radio Tube Amplifies In Television Range

A NEW and powerful radio tube for use in the high frequency regions that television and other new radio services will utilize was revealed to the Institute of Radio Engineers at their meeting in New York City, by A. L. Samuel and N. E. Sowers of the Bell Telephone Laboratories.

The new tube is a push-pull power pentode. Through its use it will be possible for radio engineers to construct stable amplifiers at ultra-high frequencies having gains of 12 to 25 decibels per stage of amplification and delivering

several watts of power. Its stability and distortion in the extreme short wave region of 80 to 300 megacycles compare favorably with the performance of conventional tubes at much lower frequencies.

Unusual construction features include the mounting of two pentodes in the same envelope with inter-connected screen and suppressor grids, complete shielding between the input and output circuits with no common leads, and provision for cooling all grids while maintaining extremely small spacings between the electrodes. The electrical characteristics depart from the conventional mainly in the low value of lead inductances and the high value of the grid input resistance at ultra-high frequencies.

Science News Letter, October 17, 1936

GENETICS

April to July for Birth Of Male Babies

IF IT'S a boy you want, Fond Parents, plan his birth date for some time between April and July.

American birth statistics support the view that conception occurring from July to September is "favorable to increased masculinity," according to *The Journal of the American Medical Association* (October 10).

English investigators find that rural areas produce more boy babies than do the cities, and from statistics available in the United States the same seems to be true here.

Social upheavals seem to bring more boy babies. During the World War and immediately thereafter, the ratio of male births increased in the war countries. Neutral nations experienced the same phenomenon but not to such an appreciable degree.

In England and Wales the upper classes give birth to more boys in proportion than do the lower classes.

In Greece the masculinity of births is exceptionally high. In Japan and Italy it is low.

W. T. Russell, the investigator quoted by the medical journal, finds no conclusive evidence that the sex ratio is related to the age of the parents, but any relationship that may exist is with the age of the father rather than with the age of the mother.

"The biologic fact of the preponderance of male births in the human race is an established one," says the medical journal, "but its purpose is still a matter of debate."

Science News Letter, October 17, 1936

VITAL STATISTICS

Longer Life for Workers Gained by Health Efforts

LONGER life for the working classes in this country has been gained during the past quarter of a century as a result of public health activities, a report of the Metropolitan Life Insurance Company shows.

The expectation of life at birth for the industrial policyholders of this company crossed the 60-year mark for the first time in 1935. In 1911 the expectation of life at birth for this class of the population was only 46.63 years whereas now it is 60.25 years.

Expectation of life at birth for the working classes is now almost as good as for the population as a whole, it appears from comparison of the life insurance figures with those of the United States Registration Area. For the whole population, in 1934, life expectation at birth was 60.79 years.

The gain in life expectation of the insured wage earners appears even more striking when compared with urban dwellers rather than with the population as a whole. This is a fairer comparison, the life insurance statisticians point out, because the insured wage earners live chiefly in cities. White males of age 10 in the urban area of the United States gained 3.95 years of life from 1910 to 1930, while white male industrial policyholders at the same age gained 6.77 years from 1911-12 to 1930. At the same age white females in the industrial policyholder group gained a year more than those in the urban area of the United States.

The gain in life expectation for the industrial class is all the more striking and encouraging because it was made during a quarter century that included the World War, the devastating 1918-19 influenza epidemic and the economic depression, each of which greatly affected the lives and health of the population. Commenting on this, the life insurance officers compliment the health authorities of the country as follows:

"Throughout this quarter century, and in the face of the calamities mentioned, those charged with the administration of our public health activities have maintained a scientific attitude toward their duties. Current discoveries in medicine and sanitary science have been applied as soon as they had demonstrated their worth. The results are undoubtedly reflected in the highly gratifying figures that have been quoted."

Science News Letter, October 17, 1936