PHYSICS

Higher Power Cathode Rays

A super-power cathode ray tube, which will take much higher voltages than the tube which he demonstrated recently at the Franklin Institute, in Philadelphia, and which has attracted considerable scientific attention, is now planned by Dr. W. D. Coolidge, assistant director of the General Electric Company's research laboratory. The new form of the tube is described by Dr. Coolidge in the *Journal of the Franklin Institute*. This is the first complete article by Dr. Coolidge on his new work.

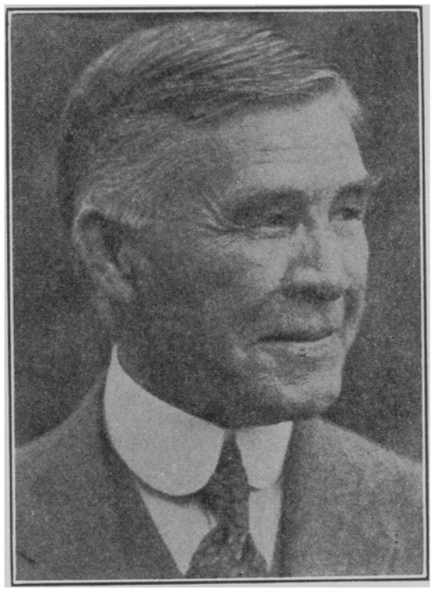
Briefly, the method which he proposes to use is to "cascade" two or more tubes, the rays from one being fed into another, which speeds them up still further and increases their range. The cathode rays are rapidly moving electrons, small particles of electricity, moving with speeds of a hundred thousand or more miles a second. These electrons start from a small electric light filament from which they come at speeds of merely a few miles a second. With a voltage of 350,000 they are speeded up within the tube, so that they leave it with a velocity of 150,000 miles a second. By building larger tubes, it will be possible to increase the voltage to a certain limit, but when too much power is applied to a single tube the cathode itself is bombarded by positive rays, which move in opposite directions to the cathode or negative rays. This introduces troublesome effects.

By arranging two or more tubes together so that the nickel window at the end of the tube, from which the rays ordinarily emerge into the open air, acts as the cathode of the next tube, they are already moving at great speed when they leave the first tube and when the same voltage is applied to the second tube they are still further accelerated. The window between the two tubes may be made thick enough so that it passes the cathode rays going in one direction, but stops the positive rays going the opposite way, as they are less penetrating. Another advantage of the multiple tube over a single very large one is that it is much easier to supply, for instance, four tubes with 250,000 volts each than one tube with a million volts.

Dr. Coolidge says that he will try out this arrangement of the tubes as soon as the development of the single tube has been pushed to as high a voltage as possible.

Science News-Letter, December 18, 1926

CHEMISTRY



EDWARD CURTIS FRANKLIN

Forty Years of Chemistry

The friends and former students—and all his former students are his friends, which is more than can be said of most teachers—are to establish a Fellowship Fund for Franklin as an ever living memorial on the occasion of his retirement from the professorship of organic chemistry in Stanford University next spring.

If teaching consists, as is still commonly held, in pumping information under high pressure into a class full of unwilling brains, Franklin could not be called preeminent as a pedagogue. But if teaching consists, as it should, primarily in leadership and example, in showing the student what research means by doing research in his presence and lending a helping hand to a student when he is trying to do something for himself, then Franklin has always been a great teacher from the time when, as a student at the University of Kansas in the eighties, he became "the assistant" in chemistry to Professor E. H. S. Bailey while his brother, W. S. Franklin, now of Massachusetts Institute of Technology, was "the assistant" in physics.

Franklin's outstanding characteristic in the University of Kansas was his independence of thought and action. He thought things out with hs own mind and worked them out with his own hands with very little dependence upon books. In fact he had not many books to depend upon, since the entire chemical library was contained in one small bookcase with two glass doors kept in the balance room.

(*Just turn the page*)

MANUFACTURES

Indoor Traffic Lanes

Traffic lanes in factories, marked off on the floor with white and red lines, are proposed by M. R. Paul, color expert.

Following the white line indoors as well as out will promote speed and safety, he shows in a report to Industrial Psychology, because when the aisles in a busy shop are plainly indicated, they can be kept clear for traffic. For danger zones in factories he recommends red traffic lines to insure caution.

Piping systems in factories should be painted in colors to indicate whether the contents are dangerous to life or property, Mr. Paul states. A subcommittee of the American Engineering Standards Committee, of which Mr. Paul is a member, has worked out a system of colors for this purpose. A yellow pipe would indicate dangerous material; green, safe products; blue, protective material; purple, extra valuable material; and red, fire control equipment.

Use of a color system would, in the event of a leaking pipe, enable the foreman to know at once the general significance of the situation and whether to sound a general alarm.

In plants where the decorative effect is considered important he suggests that the pipes may be of the same color as the wall, with bands of color identifying them, painted at joints and a foot from the place where each pipe enters the wall, floor, or ceiling.

Science News-Letter, December 18, 1926

PHYSIOLOGY

Rat Has Longevity Record

A rat without a thyroid gland has lived to what would correspond in man to the ripe old age of 82.

A record of the thyroidless rodent was kept by Dr. Frederick S. Hammett of the Wistar Institute in the process of collecting data on the part played by the thyroid gland in growth. The rat apparently managed to exist quite happily minus his thyroid for two years and eight months. Since three years is calculated to be about the maximum age limit for rats, which is practically equivalent to that of 90 years for man, this longevity record is considered remarkable.

The animal received no thyroid substance in the diet from the time the gland was removed until the time of his death, said Dr. Hammett.

Science News-Letter, December 18, 1926

Forty Years of Chemistry

(*Continued from Page* 179)

In 1890 he went to the University of Berlin, then the Mecca of every ambitious student, and three years later he earned his Ph.D. at Johns Hopkins. He continued as professor at the University of Kansas until 1903 when Stanford University enticed him away by the offer of a better liquid air machine. There he has since remained except for the war year of 1918 which he spent in Washington as consulting chemist of the Ordnance Department. He was made a member of the National Academy of Sciences in 1914, and was President of the American Chemical Society in 1923.

Franklin's career as a chemist is a striking example of what can be accomplished by choosing a fertile field of investigation and sticking to its cultivation with unflagging energy and persistence. For a quarter century he has concentrated his efforts on the study of liquid ammonia as a solvent and has proved that it acts very much like water in the solution of acids, bases and salts. These researches have opened a wider domain to the electrolytic theory and thrown new light upon the chemistry of nitrogen.

Science News-Letter, December 18, 1926

Sixty species of bamboo are found in China.

The peanut is not a nut, botanically speaking.

The only part of poison ivy that is poisonous is the sap.

White elephants were known more than 2,000 years ago.

A wrist watch made into a cuff link is a recent innovation.

Cloth is made from pineapple leaves in the Philippines.

The calcium content of the blood is increased during sleep.

Over 90 per cent of the radio fans in Milwaukee use loud speakers.

Only one man in 4,000 becomes "eminent," Sir Francis Galton found.

There were 83 deaths from aviation accidents in the United States in 1925.

The big sequoia trees of California were a well developed genus in the distant age of the dinosaurs.

Between 12 and 15 million radio sets are in use in the world, according to a recent survey.