SCIENCE NEWS

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THE ELECTRONIC TUBE

THAT the electronic tube, heart and soul of modern electronic devices, can trace its ancestry back about three centuries was pointed out by Ilia E. Mouromtseff, of the Westinghouse Electric and Manufacturing Company, Bloomfield, N. J., at the Chicago meeting of the National Electronics Conference.

The invention of a primitive vacuum pump and electrostatic friction machine by Otto von Guericke three hundred years ago was the forerunner of the electronic tube. The pump made it possible to remove air from a glass vessel, and by attaching two electrodes inside the evacuated glass vessel a colorful gas discharged could be observed. This is a basic principle of electronic tubes and electric lamps.

Science did not begin to study this invention until the 1870's, when the work of Wilhelm Hittorf in Germany and William Crookes of Great Britain resulted in research by others which led not only in the development of the electron theory, but also in the development of modern electronic tubes and the whole electronic industry.

The electron theory is based upon the principle that all matter is made up of countless electrons.

The scientific work of Crookes inspired the invention of three important types of electron tubes: the Lenard tube and the x-ray tube, both of which are important to modern medical science, and the Braun tube which is the forerunner of the modern cathode ray tube, and the tubes used in television.

In addition to these specialized tubes, Mr. Mouromtseff pointed out that the incandescent lamp developed by Thomas A. Edison was the father of the tubes used to-day to transmit and receive radio programs. A British professor, J. A. Fleming, used Edison's observations to develop the first vacuum tube detector for radio waves. Later, the American inventor, Lee de Forest, increased the sensitivity of the vacuum tube by adding a grid, which controls the flow of electrons. It was eventually discovered that de Forest's tube could not only detect radio signals, but could also amplify them. This inaugurated the engineering art of broadcasting.

Still another tube, the "electric eye" or photo-electric cell, is a descendant of von Guericke's invention. The photo-electric effect was first observed by a Frenchman, E. Becquerel, more than a hundred years ago. To-day it is used in a wide variety of control, safety and regulating devices.

ITEMS

"THE effects of the present war on birth rates have been much more varied than in World War I," was reported by Dr. Louis I. Dublin, of the Metropolitan Life Insurance Company, at the New York meeting of the American Public Health Association. Russian and German birth rates have been most seriously affected and their military losses have been the heaviest of all belligerents. The French birth rate has fallen, but not to the low level of the first World War. In the Netherlands and Denmark, the birth rates have actually increased above pre-war levels. The birth rate in the United States has increased to the highest level in twenty years, but a sharp reduction in 1945 is expected because so many young men are overseas and likely to remain there for some time. England also has experienced a war boom in births, with this year expected to put the rate at its highest figure for fifteen or more years.

A GROUP of scientists from the Lebedev Institute of Physics of the U.S.S.R. Academy of Sciences has left for the Pamir Mountains to study cosmic rays at high altitudes. The expedition, under the direction of Professor D. V. Smobeltsyn, will continue studies that have been carried on for several years at the Atomic Nucleus Laboratory on Mount Elbrus, the highest mountain in the Caucasus. The Pamir Mountains are located in southern Russia, where they reach into both Afghanistan and India. The main objective of the expedition is to study the composition of cosmic radiations at high altitudes and determine the role played by heavy particles and secondary mesons first discovered in cosmic radiations in 1937. In conducting its studies, the expedition will make use of a perfected proportional telescope and improved methods which the Atomic Nucleus Laboratory has developed.

MORE than 300,000 volunteer instructors in health and sanitation of the U.S.S.R. are aiding regular full-time staffs. Upon collective farms and in city neighborhoods there are 170,000 Red Cross posts in operation. In Moscow alone there are 10,500 sanitation instructors, including a thousand at public dining halls. Students are taking an active part in the work. More than 33,000,000 pieces of popular literature have been issued, including some 10,000,000 in different languages of the U.S.S.R., and 5,000,000 lectures and talks have been arranged during the past two years. The Soviet Scientists Anti-Fascist Committee, in making the survey, credits this educational work with helping to preserve the nation's good health record and preventing epidemics which are the usual accompaniment of war.

DR. G. P. VINCENT, of the Mathieson Alkali Works, speaking before the American Chemical Society, stated that the removal of tastes and odors in public water supply systems caused by industrial wastes may now be accomplished by a new process in which chlorine dioxide is used. The water, he said, is first treated with chlorine to kill germs, and then with chlorine dioxide to remove chlorophenol taste and odor. In tests by the Niagara Falls, N. Y., water department, it was demonstrated over a period of several months that water too contaminated for the usual chlorine treatment was successfully purified by the new process. The chlorine dioxide is made by treating sodium chlorite with chlorine water, using the customary chlorinating apparatus at the filter plant. It is claimed that the new process is not only much more efficient than ordinary chlorination, but is also more economical and simpler to operate.