drogen. He wanted to know whether the deutons (deuterium nuclei) shattered themselves against heavier atoms. They do not. When propelled against the light beryllium atom they penetrate the nucleus and apparently turn it into boron. In its exuberance the newly born boron nucleus kicks out a neutron with ten million volts energy, so the Pasadena experimenters found.

With the Lawrence whirligig atom gun, the yield of neutrons has been increased until 10,000,000 neutrons per second are produced and the experimenters are confident that at least five times that number will be produced shortly by increasing the current that carries the deutons into the machine.

It is the most concentrated and powerful stream or ray of atomic projectiles that man now has at his command. This artificially produced blast of neutrons is larger than the stream that can be produced by using radium as a bombarding and instigating source.

Neutron streams are not the same sort of radiation as X-rays or as gamma rays from radium. Neutrons are minute atomic particles, while gamma or X-rays are electro-magnetic waves. Neither is neutron radiation the most energetic radiation studied by physicists, for the cosmic rays, some of which consist of high speed particles, have energies in some cases several times greater. Cosmic radiation sprinkles the earth like continuous rain, making it impossible to use it in concentrated form.

The electrical neutrality of the neutron is a great advantage to it when it is used as a tool for penetrating the very hearts of atoms. Ions or kernels of atoms, protons and electrons have electrical fields that complicate the process of penetrating the hearts of atoms.

Investigation of the constitution of matter is the immediate objective of the physicists who have developed these neutron streams and other tools for attacking the atom. Biologists and medical research workers will utilize these newer radiations in experiments to discover their effects on living organisms. First these experiments will be on the lower forms of life, on experimental animals, and then if the results are promising, the investigations will be extended to human beings and possibly to the treatment of diseases for which the radiations are found to be effective.

Science News Letter, January 27, 1934

PARASITOLOGY

Many Found to be Carriers Of Disease-Causing Amoeba

MINUTE animal parasites, some of them the kind of amoeba that caused the dysentery which was reported as epidemic and took death toll in Chicago this summer, are more widespread in the general population than has been suspected, Drs. D. H. Wenrich, R. M. Stabler and J. H. Arnett of the University of Pennsylvania conclude as the result of a survey of 700 freshmen entering college in 1931 and 1932.

A single examination made for each person showed that about one in 20 harbors the parasite, *Endamoeba histolytica,* which causes the amoebic disease and belongs to the group of microscopic animals known as the protozoa. But the scientists believe that five or six examinations may be required to determine the actual percentage, so that probably about ten per cent. of those examined harbor these parasites.

Most of those with the parasites are not ill, but are carriers who through carelessness may infect others in their community. This is especially true if they are food-handlers.

Surveys made recently in Tennessee show that in the rural populations of that state probably one in five persons harbor the disease-producing amoeba. Closer to the tropics the incidence of the parasite tends to be larger.

One-third of the college freshmen tested once by Drs. Wenrich, Stabler and Arnett were found to harbor one or more of seven kinds of protozoan parasites, including the dysentery-producing amoeba. Four other kinds of amoeba are likely to be confused with the disease-producer and expert knowledge is needed to make the diagnoses. Two other parasites belonging to the flagellate protozoa were found and these are thought by some to produce a mild illness in susceptible persons.

This elaborates previous article (*See SNL, Jan. 6, '34, p. 7.*)

Science News Letter, January 27, 1934

RADIO

FORESTRY AND YOUTH CONSERVATION

an address by

Ferdinand A. Silcox

Chief Forester of the U. S. Forest Service

Wednesday, January 31, at 4:30 p. m., Eastern Standard Time, over Stations of the Columbia Broadcasting System. Each week a prominent scientist speaks over the Columbia System under the auspices of Science Service.

IMMUNOLOGY

Adrenal Cortex May Give Resistance to Poliomyelitis

DOES the vital cortex of the adrenal glands play a part in developing resistance to infantile paralysis?

Evidence that this may be so and that, at all events, resistance to this disease is not produced in the manner typical for other diseases was presented by Dr. Claus W. Jungeblut of College of Physicians and Surgeons, Columbia University, at the meeting in Philadelphia of the Society of American Bacteriologists.

Dr. Jungeblut was investigating the problem of how blood serum from normal persons inactivates infantile paralysis virus, so that the person whose blood possesses this inactivating power does not acquire the disease even if the virus enters his body.

He tested the anti-virus property of the blood of one monkey both before and after the animal's adrenal glands had been removed. Before the operation the animal's blood serum inactivated the virus, but failed to do so after removal of the adrenal glands. The neutralizing power could be restored to the blood serum, in the test tube at least, by adding a small amount of adrenal cortex hormone but not by adding adrenalin, the hormone from the medulla of the adrenal glands.

He reported many other tests with blood sera possessing antivirus, antibacterial and antitoxic properties which showed indirectly that the substance in human blood which can neutralize or inactivate infantile paralysis is not a typical antibody, in the immunological sense of the word.

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