MEDICINE

White Cells as Medicine

White blood cells have now been separated for the first time and will be used to fight disease and atomic radiation ills. They, as red cells, will have to be typed.

➤ WHITE blood cells, fighters of infection in the human body, will become available for treating disease or atomic radiation ills as a result of the National Blood Program to which Americans by the thousands are giving their periodic pints.

For the first time scientists are separating the white blood cells as they have the red cells, plasma and other important ingredients that save life upon the battlefield and rescue the sick and prevent disease in everyday life.

When Dr. Edwin J. Cohn, the Harvard chemist, demonstrated a new mobile blood processing laboratory-on-a-truck to the National Academy of Sciences in Schenectady, N. Y., quantities of the white cells separated were rushed by air to experimenters who will have their chance to try them in actual experimental treatment.

The early work on the white cells shows that they have types as intricate as the red cell varieties which have been recognized for half a century. Before white cells are used they will have to be typed to see whether they match with the patient's own white cells. Typing the red cells alone will not be enough because the same type of red cell may be accompanied by several white cell types, complicating the already complex picture of exchange of blood between persons and use of blood fractions as drugs.

The new blood processing unit is a complete factory-on-wheels for handling human blood so that every one of the three-score and more blood fractions are saved and most of them actually separated and ready for use. Five centrifuges, constant refrigeration, new plastic apparatus and clever science and engineering applications have entered into this compact and mobile laboratory as a part of our atomic defense.

A score more of them will probably be built ready to take the road for blood handling in any emergency, such as would result from atom bomb attack.

In four hours after the blood is taken out of the donor's veins in an accompanying bloodmobile, the whole separation can be accomplished, resulting in red cells, white cells, platelets and nine essential plasma fractions being produced for medical use or stockpiling. Every bit of the human blood except a little salt water left over of no worth can be utilized.

Blood as processed in past years has provided life-saving plasma and measles-preventing globulin and other applied benefits. Dr. Cohn's new processing, using advanced methods developed by broad cooperative research by scores of scientists, promises even more benefits medically in the future.

The white cells can now be kept alive at least for several weeks, suggesting the possibility of use for human patients as soon as investigations show what is advisable. The platelets are a promising new raw material for medical use, but this is a development for the future.

In past processing of blood the white cells have been destroyed by the surfaces of glass and metal used to handle the blood. In the new continuous processing this has been prevented by using plastic containers or by coating the glass used with silicone, one of the newer plastics.

Science News Letter, October 21, 1950

MEDICINE

Rabbit Fever via Water

➤ DISCOVERY of the first cases in America of humans getting rabbit fever from a domestic water supply is announced in PUBLIC HEALTH REPORTS, official publication of the U. S. Public Health Service in Washington.

Rabbit fever, known also as tularemia, ordinarily is contracted by handling rodents or rabbits which have the germs in their bodies.

The discovery, which it seemed at first might constitute a major public health problem, was made by Drs. W. L. Jellison, of the Public Health Service's Rocky Mountain Laboratory at Hamilton, Mont., Deane C. Epler, physician at Bozeman, Mont., and Edith Kuhns and Glen M. Kohls of the hygienic laboratory of the Montana State Board of Health at Helena.

Four human patients, present and previous occupants of the same Montana ranch, had definitely contracted tularemia from drinking water during the past year, the scientists report. None of the four had come in close contact with either rodents or rabbits, the most likely carriers of the disease. Dr. Jellison and associates also eliminated contaminated food, but tests of

MOST POWERFUL REACTOR—The most powerful of all nuclear reactors is the heavy-water pile of the Atomic Energy Project at Chalk River, Ontario, under the direction of the National Research Council. The instrument in the center of the picture (where the lady is working) is a neutron spectrometer where the structure of certain chemical compounds is determined. This atomic furnace offers unique facilities for the collection of fundamental data on atomic energy and on behavior of materials under intense bombardment of radiations.

the water supply showed the wide presence of the tularemia bacilli.

Retrospective analysis indicated that two other persons had probably incurred the infection. They had suffered from a protracted and undiagnosed illness.

Public Health Service scientists had been expecting something like this for some time. All cases of tularemia are referred to them by local doctors as requested. They had observed the contamination of natural waters with the tularemia bacillus and these waters are used as rural water supply systems. Just why the tularemia infection from drinking water had not turned up before, as it had in Russia, they were not certain. They suspected, however, that tularemia strains in Montana water, at least, were weak. In another investigation they found that during a 14-month period a majority of the streams in Montana were contaminated.

Commenting on this finding in Montana, Dr. Carl Larson, director of the Rocky Mountain Laboratory of the National Institutes of Health, said that "while stronger strains of tularemia might appear in local water supplies through contamination by heavily infected animals, if that is the mode of contamination, it is still not probable that water-borne tularemia will become a widespread public health problem. Both town and city water supply systems kill the tularemia bacillus through the usual process of chlorination. And in rural areas, if need be, home chlorination or boiling of water would constitute an effective means of control.

"The number of cases is not very great at the present time. Some 1,500 to 3,000 cases, I should say, occur yearly. On the other hand it is not to be dismissed lightly. Its victims suffer badly and for a long period. Tularemia tends to spread rapidly from the point of infection to attack the lymph nodes, spleen, liver, kidney or lung and frequently develops into a typhoid-like state or a typical pneumonia or both."

Science News Letter, October 21, 1950

MEDICINE

Vitamin B Leukemia Aid

➤ ISOLATION and synthesis of a new B vitamin that may help patients with leukemia, though it is not itself a cure or treatment for leukemia, is announced by scientists of the Lederle Laboratories in Pearl River, N. Y., and the Calco Chemical Division, Bound Brook, N. J., of the American Cyanamid Company.

The new vitamin is not given any name in the scientists' report to the JOURNAL OF THE AMERICAN CHEMICAL SOCIETY (Sept.). They merely call it "a substance active for *Leuconostoc citrovorum* and the chick." *Leuconostoc citrovorum* is a bacterium important in the dairy industry. The vitamin is otherwise identified by the Roman numeral I.

The importance of the new vitamin for leukemia patients is that it "competitively reverses the toxicity" of one of the anti-folic acid vitamin chemicals now used in treating leukemia. This anti-folic acid chemical is called 4-aminopteroylglutamic acid.

Patients getting large amounts of the 4-amino chemical sometimes suffer toxic reactions such as painful inflammations and ulcers of the mouth, diarrhea and hemorrhage from stomach and intestines. The new vitamin may overcome these severe toxic reactions and enable doctors to give more of the chemical that helps the leukemia patients. The report in the chemical society journal states only that it reverses toxicity in the mouse, but since the chemical has been synthesized there doubtless will be plenty of it for human patients if clinical tests show it is effective.

Scientists reporting the new vitamin are: John A. Brockman, Jr., Barbara Roth, H. P. Broquist, Martin E. Hultquist, James M. Smith, Jr., Marvin J. Fahrenbach, Donna B. Cosulich, Robert P. Parker, E. L. R. Stokstad and T. H. Jukes.

Science News Letter, October 21, 1950

Question Box

AERONAUTICS

How does "Squirting Gertie" do her bit? p. 261.

How long does it take to earn a pilot's license? p. 264.

ENTOMOLOGY

What is the value of cricket collecting? p. 263.

GENERAL SCIENCE

How will student deferment affect smaller colleges? p. 262.

MEDICINE

What is the newly discovered way by which rabbit fever can be contracted? p. 259.

PHYSICS

How can cloud seeding in the southwest cause rains in the southeast? p. 258.

Where is a great store of untapped energy? p. 264.

ZOOLOGY

What is the favorite food of Minnie Mouse? p. 265.

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