

GENERAL SCIENCE

Defense Blood Factory

Every man and woman in the United States is on 24-hour shift for a vital defense product—good red blood, essential both for overseas and home use.

➤ EVERY MAN and woman in America is a walking factory for a vital defense product. It is a product that no other factory can turn out. Maybe you can guess what it is—good red blood.

Blood is needed for our troops overseas and for the civilian population at home in case of disasters, from atomic bombing to fires or traffic accidents.

Our blood banks operating under the National Blood Program are running dangerously low. But our human blood factories are operating on their regular 24-hour, seven-day-a-week shift.

Blood factories in the human body are located in the marrow of the bones and in the liver, spleen and lymph nodes, or glands. You put raw materials into them every time you take a drink of water and eat a meal of vegetables and meat or eggs or fish or poultry or cheese or other protein food.

When the food is digested, some of the protein building blocks, called amino acids, go to the bone marrow for manufacture into red blood cells that carry oxygen from the lungs to every part of the body. Some is made into white blood cells that help defend the body against disease germs. Some goes to the liver, spleen and lymph nodes to be made into proteins for the fluid part of the blood, or plasma. These plasma proteins also help fight disease germs.

The human blood factory constitutes a first line of defense when blood and plasma are needed for the wounded. Substitute fluids, made in non-living factories from synthetic chemicals or from a sugar by-product, are at best only a second line of defense. They can keep fluid in the veins and thus help fight shock temporarily. But they cannot carry vital oxygen or supply nourishment or raw materials for making more blood.

Giving blood at one of the National Blood Program collection centers or to one of its Bloodmobiles is a painless procedure. A prick of a tiny needle, no worse than all of us get from time to time from a sewing needle or pin, is all that is felt. This tiny needle is used to inject a bit of pain-killing medicine called procaine. When that has taken effect, the larger blood-collecting needle is injected.

For those who dread even a slight needle prick, a newer spray method of injecting the pain-killing medicine may be available some day. At present scientists are working to perfect this for the blood program. One of the problems to be solved is that of getting the procaine the right depth into

the body, so it will be where it is needed to stop the pain of the larger needle.

The human blood-making machine on its round the clock daily production schedule makes blood so fast that a person will have enough to give a pint safely every two months.

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PHYSIOLOGY

Jet Pilots Bailing Out High Should Hold Chute Opening

➤ JET PILOTS who are forced to jump from planes when they are several miles above the earth should wait a bit before opening their parachutes.

This advice from six physiologists of the U. S. Air Force School of Aviation Medicine in San Antonio results from their studies of man's reaction to the 65 degrees



DRESSED FOR 50,000 FEET—Dr. Albert Hetherington of the Air Force School of Aviation Medicine shows here the proper attire for pilots who will be tossed around by 125-miles-per-hour winds at 65 degrees below zero Fahrenheit.

below zero Fahrenheit temperatures found at 50,000 feet. It is better, they conclude, to fall fast through this dangerously cold atmosphere, waiting until the air is warmer before pulling the ripcord.

American medical records show only five fully-reported cases of flyers who abandoned their planes at 38,000 feet or higher. So at the Eglin Air Force Base near Pensacola, Fla., the medical men tried to set up the conditions a pilot would meet after leaving his plane at 50,000 feet.

They tested 79 volunteers for three minutes at a time in winds ranging from 115 to 125 miles per hour with the temperature at minus 65 degrees. Wearing flying suits of various weights, the subjects hit the blast in different positions such as those a falling body might assume. Some were turned over and over on a rack to simulate tumbling. In a number of tests they breathed air low in oxygen, as a pilot would if he had a leaking mask.

Skin temperature, blood pressure, heart beat and respiration measurements showed that the men suffered no injuries from the exposure to super-icy winds, although some of them did report a good deal of discomfort from the cold.

The six physiologists, all from the School of Aviation Medicine, were Drs. Albert W. Hetherington, now at Carswell Air Force Base at Fort Worth, Texas, Louis E. Moses, Ulrich C. Luft, Syrrrel S. Wilks, Henry B. Hale and Hans-Georg Clamann.

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INVENTION

Telephone Talk Carried on Away From Phone Set

➤ THE OFFICE man with a tiny sound wave receiver in his ear will be able to carry on a telephone conversation from most any place in the room by means of a special telephone set on his desk but without wires connecting the set to him or to the gadget in his ear.

The inventor is Ralph K. Potter, Morristown, N. J. His award was patent 2,568,823. Rights are assigned to the Bell Telephone Laboratories, Inc., New York City.

The telephone terminal on the desk picks up the incoming telephone conversation, converts the sound waves into ultrasonic waves too high in pitch to be audible by the normal ear, and radiates these ultrasonic waves into space. The gadget in the ear, which uses no other power than that provided by the sound waves, picks them up and converts them back again into audible sound waves to beat on the eardrum.

No one in the room can hear the incoming conversation without a capsule detector in his ear. The return conversation is, however, audible to others. The user speaks in an ordinary voice directed toward the telephone terminal. A microphone in it picks up the sound waves, amplifies them greatly, and passes them on to the telephone circuit.

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