



LOADING FLYING BOXCAR—One of the fleet of large cargo planes used to airlift supplies to our combat forces in the Far East is shown here being loaded with a 105-mm howitzer. The plane is the U. S. Air Force C-119 "Flying Boxcar."

ELECTRONICS

Blood Flow Measured

Newly developed electronic device measures flow of liquids, including surge of blood in veins and arteries without use of surgery. Operates ultrasonically or in audible range.

► AN ELECTRONIC gadget has been invented that permits doctors to measure, without surgery, blood flow in veins of the body lying near the skin.

Even when the blood vessel lies deep within the body, a projected refinement of Henry P. Kalmus' electronic flowmeter is expected to eliminate the need for cutting into the body.

As it is, the vein or artery itself does not have to be cut into, explained Mr. Kalmus, a scientist at the National Bureau of Standards. Two tiny crystals, each no bigger than a pea, can be laid right on the blood vessel when a doctor wants to know how fast, or how much, blood is surging through the vessel.

The crystals, made of material much like that used in home phonograph pickups, alternately send out sound waves that are received by the "listening" crystal of the pair after the sound has gone through the blood.

Then the crystals reverse their roles and the first "listens" while the second sends the sound waves. Through electronic equipment, the received and transmitted sounds

are compared to reveal the speed of blood flow in the vein or artery.

When the size of the blood vessel is known, the instrument can be used to tell how much blood is pulsing through the artery or flowing through the vein. This information is valuable in the study of battle-wounds and frostbite, to mention a few applications. It also provides valuable knowledge to doctors probing the acceleration problems that surround pilots flying supersonic jet planes.

The Kalmus flowmeter gets around some disadvantages of many present types. The two crystals do not have to be spaced accurately; in some present instruments, spacing is critical. Neither must the temperature of the gas or liquid under study be controlled carefully.

When the flowmeter is being used to measure liquid flow, the tiny crystals emit ultrasonic sounds. But they send out sounds largely in the audible range when a gas, such as air, is under observation.

In addition to its biological and medical applications, the flowmeter can be used to measure the speed of ships and aircraft. As

a speedometer for airplanes, it should be less "clumsy" than present mechanical devices.

The device also can be used to measure the flow of rivers to show civil engineers how to harness the rivers to prevent disastrous spring floods. Air conditioning engineers also can use it to study minute drafts in houses, Mr. Kalmus reported.

The flowmeter was demonstrated to the 40 winners of the Science Talent Search when they were in Washington.

Science News Letter, March 7, 1953

GENERAL SCIENCE

Talent Search Winners Visit Bureau of Standards

See Front Cover

► THE 40 top young scientists attending the Twelfth Science Talent Institute are shown on the cover of this week's SCIENCE NEWS LETTER in a photograph taken during their tour of the National Bureau of Standards, after a welcoming speech by Dr. A. T. McPherson, associate director.

John H. Parks of the high voltage laboratory at the Bureau is explaining to the young students some of the work being done in his division. Shown in the right background of the picture is part of the surge voltage generator, capable of producing up to 2,000,000 volts, which is used to develop new test methods for measuring high voltage surges.

In his hand Mr. Parks is holding one of the high voltage insulators used to compare the ability of high voltage insulators to withstand direct lightning storm flashes.

Science News Letter, March 7, 1953

BIOCHEMISTRY

Keep Livers Alive for Hours, Probing Artery III

► ANIMAL LIVERS are now being kept alive outside the body for six to eight hours in laboratories of the University of Rochester School of Medicine and Dentistry, Rochester, N. Y.

As a result, scientists believe they can get important clues to possible diet and gland causes of artery hardening.

The livers are kept alive by mechanically circulated oxygenated blood, Prof. Leon Miller reported to the American Chemical Society.

These test tube livers can continue to make blood plasma components which can be identified by radioactive tracer methods and related to certain diseases, Dr. Miller said.

The lipoproteins of the plasma, now the center of interest in the attack on artery hardening, are made in the liver, Dr. Miller finds. So are almost all other plasma proteins except the gamma globulins which are closely related to the body defenders called antibodies.

Science News Letter, March 7, 1953