MEDICINE

Chart Output of Heart

➤ DOCTORS may soon be able to measure the power output of the human heart and its reserve power in both a healthy person and a heart disease patient.

A method for doing this in animals, soon to be applied to humans, has been discovered by Dr. Donald L. Fry, Alexander J. Mallos and Alfred G. Casper of the National Heart Institute, Bethesda, Md.

By the new method, scientists can measure the velocity with which blood is ejected at a given instant from the heart into the aorta. The aorta is the great artery that arches from the top of the heart to supply blood to the entire body.

The output of the heart can be calculated by multiplying the blood velocity by the cross sectional area of the part of the aorta in which the velocity measurements are taken. From this output power, the heart's reserve power can be judged.

The physical abilities and limitations of a given heart patient and the risk to him of a stressful experience such as an operation can then be determined more precisely.

To measure the blood velocity in the aorta, the heart institute scientists thread a slender flexible plastic tube known as a catheter through a small cut in a leg artery. The catheter is double, consisting of two hollow tubes fused side by side. Openings in the side of the catheter are placed so that one of the tubes measures blood pressure about two inches downstream from the other.

The difference in pressure between these two openings is converted by a special "differential pressure gauge" to variations in electrical current that move the arm of a pen and ink recorder to produce a permanent record of the pressure difference.

The scientists have deduced a mathematical formula for calculating the instantaneous aortic blood velocity from this pressure difference. They have verified the method experimentally in dogs and in models designed to simulate the pulsating flow of blood from the heart.

Although these tests show the method to be reasonably accurate and safe in dogs, the scientists believe that further refinements are necessary before its application to human beings.

They are now concerned with developing an electric computer to perform the time consuming computations, so that the velocity will be recorded on a strip chart instantaneously. They are also trying to design a more accurate system for sensing the aortic pressures from which blood velocity is computed.

Science News Letter, September 29, 1956

CHEMISTRY

Decontaminate Water Poisoned by Atom Bomb

➤ WATER not too severely contaminated by atomic bomb explosion or atomic waste accidents can be decontaminated and made safe for emergency drinking use in 15 to 30 minutes, the American Chemical Society meeting in Atlantic City was told by William J. Lacy of the U. S. Corps of Engineers.

Ion exchange resins would be used in a process similar to that of many home water softeners. Radioactive ions in the contaminated water would be deposited upon the resin so that the water drawn off is safe for use.

The method would be effective, small scale experiments at Oak Ridge National Laboratory showed, if the contamination were not more than ten times the maximum safe amount. Mr. Lacy and Don C. Lindsten, who did the tests, estimate that fallout from a 20,000-ton atomic bomb could be handled by the ion exchange method.

Home water softeners that use ion exchange resins would greatly reduce atomic contamination in routine operation. A person could readily purify enough water for his family's use if a supply of the resin was available.

Small or medium sized municipal water supplies could be made potable by the ion-exchange method if not too heavily contaminated.

Science News Letter, September 29, 1956

METEOROLOGY

H-Bomb Fallout Found World-Wide

➤ RADIOACTIVE DEBRIS from two early hydrogen bomb explosions in the Pacific fell out not only in the Northern but in the Southern Hemisphere, three U. S. Weather Bureau meteorologists report.

They charted the paths taken by radioactive particles thrown into the air when Pacific coral islands were vaporized by United States H-bombs, Mike on Nov. 1, 1952, and Bravo on March 1, 1954. The fallout was measured by collecting it on gummed paper at stations around the world.

The weathermen's planetary fallout maps are totals for the first 35 days following the explosions. No attempt was made, Drs. L. Machta, R. J. List and L. F. Hubert report in *Science* (Sept. 14), to reconstruct fallout patterns within the first 24 hours.

They conclude that hydrogen bomb explosions from which large amounts of radioactive debris are spewed high in the atmosphere provide weathermen with "useful information" on world-wide circulation, even though present measuring methods are crude.

One difficulty, they point out, is that collecting hydrogen bomb debris on gummed paper is efficient only when, at the time the radioactive cloud is over a particular station, it either rains or the air is particularly turbulent.

Science News Letter, September 29, 1956