

MEDICINE

New Artificial Kidney Use

Chemical-mechanical device adapted to remove excess water from water-logged patients gives hope of future aid to heart disease victims.

► A HINT that some patients with heart disease may some day be helped by an artificial kidney appeared in a report of Dr. Lewis W. Bluemle Jr., associate in medicine at the Hospital of the University of Pennsylvania, to the American Philosophical Society meeting in Philadelphia.

The hint came when Dr. Bluemle reported that, in a few cases, a specially adapted artificial kidney had succeeded in removing some excess water from edematous, or water-logged, patients. He reported particularly on one patient who was having breathing difficulty because of fluid accumulation in his chest. The condition had reached the point of threatening the patient's life when the artificial kidney was used.

In the course of six hours, the artificial kidney had removed about one and a half quarts of water. Constant weighing of the patient on a stretcher scale during this period also showed the patient had lost almost four pounds in weight, corresponding to the loss of excess water. At the same time, the patient's breathing difficulty was relieved and the rapid rate of breathing returned to normal.

Since this edematous condition is a complication in some patients with heart failure, it seems that in the future it might be possible to help these patients, perhaps getting

them in shape to stand some of the new heart operations, by use of the artificial kidney.

Heretofore artificial kidneys have been used chiefly in cases of acute kidney failure, when the kidneys are temporarily unable to carry on their normal function. Mentioned by Dr. Bluemle as causes of such kidney failure were excessive blood loss, accidents, burns, battle injuries, childbirth accidents, mismatched blood transfusions and poisonings with such chemicals as carbon tetrachloride and bichloride of mercury.

With the artificial kidney, the patient's blood is dialyzed through semi-permeable membranes. The dialyzing membranes provide a means of filtering from the blood the end-products of the body's digestive and other chemical processes which would be poisonous if accumulated in too large amounts. The blood is then returned to the patient's circulation. The process is continuous for about six hours.

The artificial kidney can be adapted to remove excess water as well by using the principle of ultrafiltration, which puts the blood through the dialyzing membranes under high hydrostatic pressure of 200 to 300 millimeters of mercury. With this adaptation of the kidney, water can be removed at the rate of about 10 ounces an hour.

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of more than 600 miles per hour, and a service ceiling of 40,000 feet. Its cabins will be pressurized.

Designed to operate non-stop on routes up to 4,000 miles in length, the plane's operating costs have been estimated at about one cent per passenger mile.

Although no definite orders have been placed yet for the aircraft, British Overseas Airways Corporation has expressed an interest in the plane, for its various world-wide routes.

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ANIMAL NUTRITION

Scientists to Study Diet Needs of Cats

► CAT OWNERS at some future date will have a scientific nutrition yardstick for how much milk, fish heads and other proteins their pets need to keep them sleek, healthy and neither too fat nor too thin, and best able to have healthy kittens.

The yardstick will come from scientists at Rutgers University Bureau of Biological Research in New Jersey, who will study the cat's protein needs under a new \$6,000 grant from the Mark L. Morris Animal Memorial Foundation of Topeka, Kans.

The information gained from the research may also lead to better knowledge of protein needs of other animals, including man.

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ASTRONOMY

Heart of "Ices" For Comet Nucleus

► THE COMET that showered "shooting stars" on us last August has a heart of "ices" of common gases.

Support for this theory is presented in *Nature* (Nov. 7) by Dr. Peter M. Millman of the Dominion Observatory, Ottawa, Can. He spotted hydrogen, lightest of all the elements, in photographs of the fanned-out light of visible meteor particles in August's Perseid meteor shower.

Dr. Fred L. Whipple of Harvard College Observatory has suggested that the solid nucleus of a comet, composed of ices of common gases, is turned by the sun's heat into the huge cloud of gas that makes up the comet's head. The fan-like tail, by which a comet is most easily spotted, is caused by the sun's radiation, which sweeps the gases and dust back from the head of the comet.

"Some of these hydrogen ices," Dr. Millman concludes, "might well be retained in meteoritic particles large enough to produce a Perseid fireball in the visual magnitude range."

Dr. G. P. Kuiper of Yerkes Observatory has suggested that the hydrogen found by Dr. Millman could occur in the water of crystallization of certain chemical compounds believed to be present in the meteoric particles formed by comets.

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AERONAUTICS

Completing British Jetliner

► A SLEEK, delta-winged jet aircraft for hauling freight as well as passengers at speeds greater than 600 miles an hour is nearing completion in London.

The plane is designed to make the London-New York crossing in seven hours non-stop and will carry 76 to 131 passengers, depending upon the class of service. Called the Avro Atlantic, the long-range plane is a larger civilian design of the latest type of British bomber, the Avro Vulcan.

The Atlantic is being designed for economic operation, and will be able to carry all the fuel required for long non-stop flights in its delta-shaped wings. The entire fuselage, except for a small flight deck for pilot and crew and space for the nose wheel, will be available for passengers and freight.

British designers plan to use four turbo jet engines on the plane. They will be spotted at the rear edge of the delta-wing. This will allow all seating to be arranged

forward of the "noise cone" that spreads from the jet pipes.

In some models, all seats will face the rear of the plane. In the luxury version there will be accommodation in three compartments for 76 passengers, or 88 if the tentatively planned bar is omitted.

The standard model will have rows of five seats across, with a center aisle, seating 94 passengers or 109 if there is no bar. The tourist version will have six seats to a row, with center aisle, and seating 113 passengers or 131 if the bar is left out.

Freight compartments will be below the passenger deck, with small luggage and cloakroom accommodation on the passenger deck. There will also be a version of the Avro Atlantic largely for freight.

The Atlantic's wingspan will be 121 feet, its length, 145 feet. The Atlantic will weigh about 100 tons on take-off, and carry a payload varying according to distance of 10 to 22 tons. It will have a cruising speed