

MEDICINE

Kidney Transplant Takes

A university student in Milwaukee had a successful kidney transplant from his non-identical twin brother 17 months ago despite rejection of tissues shown by skin grafts.

A PRECEDENT-BREAKING kidney transplant between non-identical twins has proved successful. The operation involved a new transplant technique: total body irradiation which apparently enabled the patient to accept the foreign tissue.

The patient, John Riteris, is now an active student at Marquette University in Milwaukee, Wis., 17 months after the transplant.

Dr. John P. Merrill, one of six physicians involved in the transplant operation at Peter Bent Brigham Hospital in Boston, said in an interview that Mr. Riteris' survival is the longest on record for non-identical twins.

Kidney transplants between even identical twins are quite rare. The Boston group has performed only about ten successfully. The physical similarities between identical twins make simpler the body's acceptance of a foreign organ.

But John Riteris and his brother, Andrew, are not identical twins.

John suffered uremia, an accumulation in the blood of materials that should have been eliminated. The condition is caused by insufficient secretion of urine resulting, in this case, from faulty kidney function.

According to a report in the *New England Journal of Medicine*, 262:1251, 1960, this was the transplant procedure:

The first step was to test skin grafts between the twins. This is a test of tissue acceptance. But the young men's bodies rejected the grafts. Tissue incompatibility existed.

The doctors realized that successful transplantation would demand modification of the patient's immune response that had caused rejection of skin grafts.

This was achieved by doses of X-rays to the patient. This temporarily but not completely impaired the ability of the blood and lymph tissues to reproduce.

The patient's antibody-forming capacity—which normally causes rejection of foreign materials—was thus temporarily interrupted.

According to the doctors, the chronic uremic state of the patient also favored the operation's success. The transplantation took place on Jan. 24, 1959, 24 hours after the administration of the second X-ray dose.

Eight months after the operation it was feared that the kidney transplant might be rejected. But a second course of protracted low-dose irradiation and adrenocorticoid therapy was administered and abnormalities disappeared.

Coauthors of the *Journal* report with Dr. Merrill were Drs. Joseph E. Murray, J. Hartwell Harrison, Eli A. Friedman, James B. Dealy Jr. and Gustave J. Dammin, all Harvard University professors attached to the Peter Bent Brigham Hospital.

Kidney transplant work at the hospital has been aided by grants from the U. S. Army Medical Research and Development Command of the U. S. Surgeon General's Office, the National Heart Institute of the National Institutes of Health, the U. S. Public Health Service, the National Institute of Arthritis and Metabolic Diseases, the Atomic Energy Commission and the John A. Hartford Foundation.

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PUBLIC HEALTH

High Milk Contamination From Nuclear Accidents

RADIOACTIVE contamination of milk is likely to be "the most widespread hazard" resulting from a nuclear accident or explosion depositing fission products on agricultural land, according to recent studies in England, reported in a forthcoming issue of *Nature* by Dr. R. J. Garner of the Agricultural Research Council Radiobiological Laboratory, Compton, Berkshire.

Elements that appeared to cause the greatest contamination are the isotopes of iodine and strontium although barium-140 and cesium-137 also contribute to the peril.

These findings resulted from a series of 53 experiments with 44 cows in which the fission products were artificially introduced into the diet of the animals and their milk subsequently monitored for radioactivity.

Three weeks after contamination of the land on which the cows grazed, strontium-90 levels in their milk were five times as high as on the first day; the levels of barium-140 had doubled; cesium-137 had increased 48 times; Iodine-131 showed an increase of one-third by the third day and then decreased to one-third of the first day's level at the end of three weeks.

The tests were conducted to represent "the worst case likely to occur under conditions of British agriculture," Dr. Garner states. He took account of factors "which, under normal circumstances, would probably reduce the quantity of fission products transferred to milk," such as the dilution of contamination from rain washing the edible herbage combined with the growth of new grass.

But in preparing for control measures to deal with radiation accidents, he emphasizes that no allowances should be made for mitigating factors in order to assure the best protection.

The British study is in line with scientific thinking in this country as reported by Dr. Gilbert B. Forbes, a Rochester, N. Y. pediatrician, in the current issue of *Pediatrics*: "The peaceful use of atomic energy will in time provide fully as great a potential hazard as the bomb-testing program. We must learn to live with the new technology in the years to come."

Aiming at this, United States scientists have joined with radiation authorities from other countries in exploring cheap methods of removing strontium-90 from milk.

Plans currently are under way to construct a pilot plant for this purpose in the United States according to a Canadian design, which appears to be the most promising of several proposals. (See story opposite page.)

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ROCKETS AND MISSILES

Two Satellites Put Up With One Thor-Able-Star

THE UNITED STATES launched a pair of satellites with a single Thor-Able-Star Rocket from Cape Canaveral and signals have indicated all is well.

One of the satellites was Transit II-A, a 36-inch sphere weighing 223 pounds. It is a navigation satellite. Attached to it by a metal band was a 20-inch solar radiation measuring satellite.

After the pair of satellites separated from the rocket, a spring separated the two satellites.

The high orbit of the satellites was nearer to a polar orbit than any yet for a satellite from Cape Canaveral.

The Transit II-A carries an experimental receiver and antenna for measuring cosmic noise above the ionosphere. But its major purpose is navigational. Its transmissions on 54, 324, 162 and 216 megacycles permit a man on the ground to fix his position.

The Transit II-A is the second satellite of a world-wide navigation system expected to be operational in 1962. Transit I-B, was put into orbit April 13.

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RIDING ON AIR—This first functional model of a Hydrostreak craft, 21 feet long, was built by the Hughes Tool Company of Culver City, Cal., for the U. S. Navy. It is shown making a trial run. The vessel rides on top of the water on a cushion of air which is held beneath the craft by a thin wall of water.