



POSITION OF TRANSPLANT—A dog's brain transplanted as an isolated organ is shown here in diagrammatic form in position between the carotid artery and the jugular vein of the recipient's neck. The positions of the two pairs of electrodes for electroencephalography and one thermoprobe all cemented in the skull are also shown.

SURGERY

Dog Brain Transplanted

Isolated dog brains have been successfully transplanted for the first time, perhaps opening the way to treatment of brain tumors and other diseases—By Faye Marley

► DOG BRAINS have been successfully transplanted for the first time in medical history.

Dr. Robert J. White and his team of scientists at Cleveland Metropolitan General Hospital, Cleveland, Ohio, believe this accomplishment has opened the way to treatment of brain tumors, cancerous growths, and a better knowledge of the cause and treatment of multiple sclerosis.

"What we plan to do next," Dr. White told SCIENCE SERVICE, by telephone, elaborating on his report in *Science*, 150:779, 1965, "is to try to produce tumors, meningitis or encephalitis in the brains being transplanted and then see if the circulating blood of the normal animal can have a salutary effect on the infection."

By working on the problem of the immune mechanism, the researchers hope to find new answers to the cause and possible cure of some diseases as well as the rejection of transplants.

Because of the ability to transplant nervous tissue into another animal, Dr. White said it would be possible to study for the first time diseases such as multiple sclerosis, which are thought to have immunological origins or properties.

Dr. White had first isolated a monkey brain and then a dog brain, both of which could be kept alive for short periods with just mechanical systems. This work was of great consequence in studying brain metab-

olism but not immunological factors.

This next step of transplanting is a big step forward. Dr. White said the care of the six dogs in which transplants were done was superior to that given humans in even the most up-to-date operating room. Dr. Maurice Albin, trained in anesthesiology, monitored the anesthesia, controlling pain at all times. Only a part of the bony structure of the cranium was cut away so that support could be given to the transplant, which acted as a second brain in the animal's neck. It was placed between a carotid artery and a jugular vein and then the neck incision was closed.

The researchers referred to the work of the Russian scientist, Prof. V. P. Demikhov, who several years ago demonstrated the feasibility of transplanting the upper portion of the canine body, including the head. Dr. C. C. Guthrie reported in London that he had "revascularized" canine heads for short periods, but the more difficult surgical maneuver of transplanting the brain as an isolated organ has not been done before.

Although the donors of the brains died, the recipients lived fairly normal lives, even after the "neck" brains were removed.

The brains remained in excellent condition even after they were removed from six hours to five days after transplant. There was no evidence that any of the transplants had been rejected.

Electrocortical activity and normal up-

takes of oxygen and glucose, with production of carbon dioxide were evidence that the brains were alive. Cerebral blood flows, temperatures and pressures of the brain homograft were constantly monitored by an implanted recording instrument.

Collaborating with Dr. White were Drs. George E. Locke and Eugene Davidson. All three are on the staffs of the same hospital and of Western Reserve University School of Medicine, Cleveland.

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PHYSIOLOGY

Enzyme Acts on Sperm To Fertilize Rabbit Ova

► AN ENZYME that alters the material coating a sperm may cause the sperm to become active so that an egg can be fertilized, researchers at Michigan State University, East Lansing, Mich., believe.

Working with rabbits, Dr. Harold Hafs and Kenneth T. Kirton, a graduate student in reproductive physiology, reported in *Science*, 150:618, 1965, for the first time that rabbit sperm could be activated or "capacitated" in a test tube.

"The reason for the sperm activation," Mr. Kirton told SCIENCE SERVICE, "is the addition of the enzyme beta-amylase in a buffered solution."

Future application to humans is possible, Mr. Kirton said. Although it is too early to say, contraception might be achieved through removal of an enzyme, or an infertile couple could be helped to have children through addition of an enzyme.

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MEDICINE

Penicillin G Is Choice Over Newer Antibiotics

► PENICILLIN G is the "drug of choice" for treating central nervous system infections in children under 15 years of age, the American Academy of Pediatrics meeting in Chicago was told.

More than 70% of patients with such diseases as meningitis and pneumonia at the Los Angeles General Hospital are children between the ages of two months and 15 years, Dr. Paul F. Wehrle of the University of California at Los Angeles said.

Deafness can result if antibiotics that are toxic to the ear are given. This is a particularly serious problem when deafness develops before a child learns to talk.

Six amino penicillanic acid derivatives were carefully reviewed, Dr. Wehrle reported, and sodium ampicillin, a newer derivative very similar in structure to benzyl penicillin G, was of special interest. It was particularly effective against several Gram negative bacteria, including strains of *H. influenzae* isolated from spinal fluid. Gram negative is a term applied to bacteria decolorized by Gram's solution.

For penicillin-G-resistant staphylococcal meningitis, the drug methicillin is preferred, Dr. Wehrle said, "although cephalothin and other penicillin-resistant penicillins may be equally effective."

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