

BIOTECHNOLOGY

Study Brain Isolation

The study of a monkey's brain outside its body can lead to understanding of tumor growth and acceptance or rejection of infection—By Faye Marley

► THE OHIO SURGEON who recently kept a monkey's brain alive for seven hours is planning another experiment that will connect the brain of one monkey to some part of another monkey's anatomy, using the same circulation system.

Dr. Robert J. White of Western Reserve University School of Medicine, Cleveland, told SCIENCE SERVICE that the brain may not be quite as delicate as neurosurgeons have thought.

"We feel that the brain can be stored at low temperatures, perhaps for days, in a special refrigerator unit, then revived and used," Dr. White said. "The transplanted brain does just as well as the kidney or any other organ, but our purpose in doing this transplant is not to trade brains. It is to study this organ unencumbered by the surrounding tissues."

Dr. White began his work five years ago when he was on the staff of the Mayo Clinic in Rochester, Minn., and was the first to isolate a monkey's brain from its body.

Numerous scientists and even religious clerics interested in the soul outside the body have come to Dr. White for information.

Neurochemists are interested in what part of the brain needs sugar, for the organ has to be fed through a tube to keep it alive. A miniature mechanical system kept the brain oxygenated, but more machinery will have to be perfected for a longer-lived brain. A longer-living monkey-brain could be used in experiments to grow tumors, Dr. White said.

The tumor-ridden brain could be put into a normal animal to study whether or

not the normal animal receiving the tumor material could destroy it.

The same study could be made with a brain affected with encephalitis, or sleeping sickness, to see if the normal animal would become infected or would reject the infection.

Brain tissue is especially receptive to cold temperature, Dr. White explained. A dog whose brain has been cooled to 15 degrees centigrade can live as long as 40 minutes.

At the 50th annual American College of Surgeons meeting in Chicago, Dr. White, with Dr. Henry W. Brown, Dr. Maurice S. Albin and Dr. Javier Verdura reported a simple head-cooling system in dogs.

The anesthetized animals were placed in specially constructed plywood compartments divided into head and body chambers so the nose and mouth could be cooled with ice water, not affecting the temperatures of the body but cooling the head.

Brain temperatures were gradually lowered and maintained between 15 degrees and 19 degrees centigrade for 80 minutes to 120 minutes by naso-oral perfusion alone.

Dr. White said the reason many persons do not survive closed chest-heart massage is that the blood is not reaching the brain.

Already the Gorman Ruff Company is working on a hypothermic helmet that might be used commercially like a glass football helmet cooled with ice water. Dr. White said that while a physician is using the closed chest-heart massage, the patient's head could be kept cool.

The key organ in this massage is the brain, and only about a third of the blood reaches the brain during manual massage. This cooling process would balance the blood flow sufficiently to keep a person alive until his normal circulation was working.

The Western Reserve team agree that if "human anatomy and circulatory physiology prove adaptable to this method of surface head cooling," human applications are possible in varied instances of brain suffocation both within and outside the operating room.

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BIOCHEMISTRY

Fat Content in Diet May Affect Gallstones

► EXPERIMENTS WITH RABBIT DIET could lead to new non-surgical methods for treating and even preventing gallstones in people. The amount of fat in the diet, not the type of fat, was found responsible for forming the animals' gallstones.

Rabbits' gallstones were found to be similar in mineral content and cholesterol level to the "white" gallstones found in humans, Dr. Robert F. Borgman of Clemson University, Clemson, S.C., told the American Chemical Society's Southeastern Regional meeting in Charleston, W. Va.

Female rabbits usually had more gallstones than males, too, just as women tend to have gallstones more often than men.

Less fat in the human diet could prove useful in reducing the occurrence of gallstones Dr. Borgman believes, but he warns against adding a high level of protein to a high-fat diet. Fat alone formed gallstones, but when he added a large amount of protein to it, gallstones in rabbits increased.

Also, gallstones did not form when the original diet was low in fat.

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GENERAL SCIENCE

Friends Share Nobel Prize

► TWO GERMAN-BORN FRIENDS, who kept up a scientific correspondence over 20 years, will share the 1964 Nobel Prize in Physiology or Medicine for discoveries concerning the mechanism and regulation of cholesterol and fatty acid metabolism. The award and its accompanying \$53,123 will be presented in Stockholm Dec. 10 by King Gustaf VI Adolf of Sweden.

Prof. Konrad E. Bloch, who has been professor of biochemistry at Harvard University since 1954, came to the United States in 1936 and became a naturalized citizen in 1944. He is 52 years old.

Prof. Feodor Lynen, aged 53, is director of cell chemistry at the Max-Planck-Institute in Munich.

Both men worked on some of the 36 steps by which living cells make cholesterol, starting with a simple molecule, acetic acid.

As far back as 1951, Dr. Lynen discovered that "activated acetic acid" is identical chemically with acetyl-coenzyme A. Both

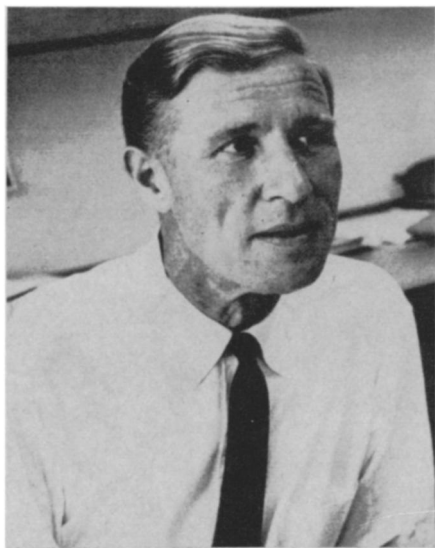
men kept track of each other's progress through shared letters.

Yeast, rat liver and enzymes were used to get basic biological information, which has been of use in developing drugs to keep down cholesterol levels.

Just what role cholesterol plays in heart disease is still undecided, but the basic work of these two Nobelists has paved the way for future discoveries. Without their long and tedious work mapping out the molecular pathway, cholesterol could not be understood or kept at its proper level.

Cholesterol is a fatlike, pearly substance found in all animal fats and oils, in bile, blood, brain tissue, milk, yolk of egg, in the sheaths of nerve fibers, the liver, kidneys and adrenal glands. It makes up a large part of the most frequently occurring type of gallstones and occurs in malignant tissue as well as in fatty cysts and plaques that clog the arteries.

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