

MEDICINE

Transplants Improved

► A SERIES of significant achievements in implanting and transplanting organs in animals and in humans points to extended life for otherwise hopeless cases.

After several years of experimentation, Dr. William J. Kolff, who in 1946 did the major work on the first artificial kidney, has announced total replacement of a living heart in several dogs that survived with the plastic compressed-air-driven "organ" for longer than a day. Dr. Kolff is one of a five-man team at the Cleveland Clinic Foundation.

The National Institutes of Health (NIH), which supported Dr. Kolff's work with grants, "looks with interest" on this recent achievement.

"The prospect of a man using an artificial heart," Dr. Ralph E. Knutti, director of the National Heart Institute, told SCIENCE SERVICE, "seems as fantastic today as the prospect of a man on the moon did several years ago." Dr. Kolff believes an artificial heart for humans can be successful.

Already a success in humans, of course, is the heart-lung machine, which operates outside the body. The NIH supported research on this also, and Dr. Knutti said the Heart Institute is interested in all kinds of bio-engineering projects.

At Georgetown Hospital in Washington, D. C., where Dr. Charles A. Hufnagel first developed a "trapped ball" valve used in 1952 to prevent blood from backing up into the heart from the aorta, work has been under way for the past 18 months on a new type of mitral valve.

Dr. John J. Gillespie, assistant professor of surgery at Georgetown, said that both the aortic and mitral valves were practical examples of artificial parts of the heart mechanism. A defective heart valve was previously hopeless, but many of the 500 gravely ill patients who had total or partial replacement of the aortic valve (located at

the root of the aorta, the body's main artery) have survived more than a year following surgery.

"It is within the realm of possibility that an artificial heart may be successful years and years from now," Dr. Gillespie said, "but it is only a fantasy at this stage. There are tremendous problems in the way."

Eventual transplantation of a healthy lung for a diseased one in humans may be practical, a Georgia surgeon reported at the annual meeting of the National Tuberculosis Association and its medical section, the American Thoracic Society, at Miami Beach.

The removal of a lung and its reimplantation in a dog that survived nearly two weeks on one lung after the other lung had been removed was described by Dr. Thomas J. Yeh, assistant professor of thoracic surgery, Medical College of Georgia, Augusta. Associated with him in the research are Drs. Lois T. and Robert G. Ellison, also of the medical college.

Causes of death in the dogs that failed to survive, Dr. Yeh said, can be overcome. Among the causes were infection, partial obstruction of the pulmonary veins, pulmonary hypertension, and, in particular, such late complications as clogging the bronchial tubes with secretions and collapse of the lung.

The immune mechanism of the body causes it to reject foreign matter but the researchers have worked on the theory that an animal would not reject its own organ.

Past accomplishments in the field of artificial organ systems also include the development of artificial bladders, respirators and eye devices.

Typical problems confronting researchers in the field are how to make the organs function perfectly, what materials to use, and what types of controls and control signals to build into them.

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Emphysema Serious

► EMPHYSEMA, a lung condition that is becoming serious, especially in cities, kills six men for every one woman, it was reported.

In emphysema inspired air becomes "trapped" in the air sacs and cannot be expelled normally. The air sacs, or alveoli, become overextended and finally their walls break down. Chronic bronchitis is often a forerunner of emphysema.

Dr. John R. Goldsmith, head of the air pollution medical studies unit, California State Department of Public Health, Berkeley, cited the emphysema figures at the annual meeting of the National Tuberculosis Association-American Thoracic Society at Miami Beach, Fla.

An English woman pathologist, Dr. Lynne Reid of the Institute of Diseases of the Chest, Brompton Hospital, London,

said the basic disturbance in chronic bronchitis is excessive secretion in the bronchial tree.

Cough and persistent production of sputum are constant features of chronic bronchitis, Dr. Reid said. This varies in severity from a social nuisance or smoker's cough to the critical and even fatal conditions of emphysema and cor pulmonale (heart disease secondary to lung disease).

In Great Britain, the meeting was told, community air pollution and cigarette smoking are believed to cause chronic bronchitis, but in the United States it is impossible to generalize because of the various kinds of air pollution and the fact that people move about a great deal.

Another report, presented by Dr. Oscar Auerbach, pathologist and senior medical investigator, Veterans Administration Hos-

pital, East Orange, N. J., indicated that women smokers appear to have a degree of protection against changes in lung cells that may be forerunners of cancer. He said the protection may be due to the fact that women inhale less deeply, start smoking cigarettes later, and other factors.

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Gravity Influences TB

► THE PULL OF GRAVITY in upright man may be why some lung diseases get a foothold in the upper portion of the lung.

Although it has been known for a long time that TB growth favors the upper portion of the lung, another lung condition, emphysema, also begins in the upper lobes.

Dr. Gordon L. Snider, chief of the Mount Sinai Hospital division of thoracic medicine, Chicago, explained the reasoning to the National Tuberculosis Association and its medical section, the American Thoracic Society:

Since the blood pressure in the lung is approximately one-sixth that in the rest of the body, very little blood is pumped against the force of gravity to the topmost parts of the lungs.

This decreased circulation in the upper third of the lungs in normal man results in an increased amount of oxygen (essential to the life of tubercle bacilli) in the lung tissue and a decreased flow of antibodies and other factors which tend to hold the tubercle bacilli in check, said Dr. Snider. However, tuberculous infection is well handled by the lower parts of the lungs.

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TB High Among Miners

► NEARLY 50% of the men working in the coal mines of southern West Virginia have lung disease.

Dr. Robert E. Hyatt, director of the cardiopulmonary laboratory, Beckley Memorial Hospital, Beckley, W. Va., reported a study of 200 coal miners living in Raleigh County bituminous coal field region to the National Tuberculosis Association and its medical section, the American Thoracic Society, at Miami Beach, Fla.

In addition to physical examination, the information was based on respiratory symptoms and pulmonary function tests, occupational history, and chest X-rays.

Evidence of occupational pneumoconiosis (reaction to dust in the lung) was observed on X-ray film in 45% of the men, Dr. Hyatt said. The condition was more prevalent among those who had worked where the coal was actually blasted or cut out than among those who had worked above ground. The degree of lung infiltration increased with the number of years spent underground.

Pulmonary function also decreased as the number of years spent in the mines increased. The decrease, Dr. Hyatt said, could not be explained by differences in age or smoking habits.

A paper-mill decrease was reported for the first time in 30 years by Dr. Dean A. Emanuel of the Marshfield, Wis., Clinic.

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