stop all blood flow through the body except to the right arm and right half of the brain. The needed surgical repair could not be done in the four or five minutes that the aorta could be clamped shut at normal body temperatures. So the anesthetist chilled the patient, the surgeon performed the operation, the patient was warmed and 11 days later walked out of the hospital, a well man.

Equally dramatic was the case of a man past 70 years old with a bad heart who developed an aneurysm. He needed to have the aneurysm removed and a piece of blood vessel grafted to replace that cut out. The surgeons were not sure how long this would take. They feared that with ordinary methods interruption of blood supply to the lower part of the man's body might have so starved the tissues of oxygen that his kidneys might have gone bad or his legs might have become gangrenous and had to be removed. So they chilled him before operating. Today this 70-year-old with the bad heart is still alive and "running around."

Methods Outlined

Refrigerating patients, inducing hypothermia (low temperature) doctors call it, can be done by many methods. At the Army's Walter Reed General Hospital in Washington, D. C., it is done by an "overgrown water bottle." This is simply a rubber mattress through which ice water can be circulated. The sleeping patient lies on the mattress and is cooled to the desired degree.

At the University of Colorado School of Medicine, Denver, the patient is cooled by being put in a tub full of ice water, warmed to normal by immersion in a tub of warm water.

European scientists run blood from an artery through a plastic tube packed in ice and back to a vein.

George Washington University scientists in Washington, D. C., run sterile cold salt water into the patient's chest, warm him up by running sterile warm salt water into the chest cavity. This is for patients who will have operations on the heart and whose chests will be opened anyway.

Doctors at Guy's Hospital in London suggest putting a small balloon into the patient's stomach through his throat, running ice water into it to cool the patient and hot water to warm him. The method succeeded in reducing high fever in a very sick baby and should, the doctors believe, be equally useful for patients having heart and great blood vessel operations.

Refrigerating human patients got its modern start in 1937 when Philadelphia doctors tried it for hopelessly sick cancer patients. The theory was that the low temperatures would slow the growth of the cancer cells. Studies of chick embryos had showed that the growth of young, embryonic and fast-growing cells was checked as temperatures were reduced. Patients were kept in "frozen sleep" at 75 degrees Fahrenheit for from 24 hours to eight days, with relief of pain and suffering.

During World War II refrigeration anesthesia was used for arm and leg wounds. The arm or leg was packed in ice and a tourniquet applied for two hours or so. After that, needed operation could be performed without further anesthetic.

"Frozen sleep" is, however, only semi-hibernation. And while it is helping patients get vitally needed surgery, it is different from the chilling that is experienced in accidental exposures to very low temperatures. The patients are gently put to sleep before the chilling. This saves them from the stressful state of great cold which can be fatal. For explorers or servicemen who might be exposed to freezing, survival might be possible if the stress could be prevented. The Chicago woman who recovered after being frozen stiff in an alley was "well anesthetized," according to one authority, by alcohol consumed before she froze.

Various drugs are now being experimented with in the hope of finding one that could prevent the stress state in freezing. Then, perhaps, men likely to be lost in very cold regions could carry with their emergency rations a supply of hibernating pills. Swallowing a few of these might enable them to have a ground hog's nap until rescuers arrived to awaken them.

Science News Letter, June 4, 1955

NUTRITION

Seek Food Source In Scum on Ponds

➤ EFFORTS TO mass-produce algae, seen often as the blue-green scum on ponds, as a possible food source will be supported by a $30,000 grant to the University of Texas for a three-year period, Dean Rusk, president of the Rockefeller Foundation, announced in New York.

The algal research program is being directed by Dr. Jack Myers, head of the university's Laboratory of Algal Physiology. For the immediate future, Dr. Myers proposes to search for new algae with characteristics of possible experimental or economic importance, to study algal metabolism, and to attempt the complete carbon dioxide reduction of blue-green algae.

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