

## NUTRITION

**Fluorides' Action in Body Reported to Symposium**

FLUORIDES in water become deposited in teeth and bones, or are quickly excreted from the body, research shows.

Dr. Harold C. Hodge, pharmacology professor at the University of Rochester School of Medicine and Dentistry in Rochester, N. Y., traced the distribution of fluorides by injecting radioactive fluorides into the blood. He reported findings on this and other research on the metabolism of fluorides at a symposium in Boston, sponsored by the American Medical Association's Council on Foods and Nutrition.

Dr. Hodge said the fluorides, often added to water to prevent tooth decay, are quickly removed from body fluids. He said fluoride is excreted rapidly and almost entirely in the urine. This is of industrial importance, he noted, because the "prompt and considerable urinary fluoride excretion" provides a guide to fluoride exposure to protect workmen from excessive, undetected exposure to fluoride. He said there is no evidence that small concentrations of fluoride have a harmful effect on kidney structure or function.

Pointing out that although "fluoride is the bone-seeker par excellence," Dr. Hodge said there is a slow loss of the deposits in the skeleton, or bone structure, through several mechanisms. When fluoride-rich crystals are dissolved, the fluoride may be translocated but is usually removed from the body in urine.

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## PSYCHOLOGY

**First Men in Space Will Not Have Many Decisions**

THE FIRST MEN in space will not often be called upon to make decisions in the ordinary sense of the word. For the most part the decisions will be limited to a simple matter of interpreting what the instruments indicate and taking the appropriate prescribed action.

The decision is no more difficult than that of a motorist waiting at a red light who must decide to go when the light turns green.

Yet even when such "decisions" could just as well be made by a machine, the "thinking" will be done by humans in the interests of equipment simplicity, weight and reliability, Dr. Alec Williams of Hughes Aircraft Company, Culver City, Calif., told a Conference on Human Decisions in Complex Systems, held under the auspices of the New York Academy of Sciences in New York.

In case of emergency or near emergency, improbable situations may arise where no definite course of action has been prescribed in advance. In this case, the operator will really have to make a decision.

Decision-making is similarly unnecessary for most personnel in a missile operation system, Dr. John E. Mangelsdorf, a psychologist of Lockheed Aircraft Corporation,

Sunnyvale, Calif., told the meeting. Even when the missile system is in a stage of development, 90% of the personnel function as a kind of animated electronic part.

Examples of this kind of work include that of the stenographer who produces a finished letter from dictation or the machinist who produces finished parts from machine drawings or the electrician who produces actual circuits from wiring diagrams.

The remaining 10% of the personnel is a "creative minority," who are responsible for all significant decisions. Some way should be found, Dr. Mangelsdorf urged, to emancipate the creative minority from paper handling and leave these few decision makers free to perform creative activity and to make the few necessary decisions and plan what the 90% will do.

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## SURGERY

**Toe Joints Function In Patients' Hands**

TRANSPLANTING a patient's toe joints and amputated fingers to his hand can restore the hand's vital grasping function.

Dr. Martin A. Entin of the Royal Victoria Hospital in Montreal, Canada, told the American Association of Plastic Surgeons in Milwaukee, Wis., that three years after these operations, the joints are functioning.

Describing the transplants in six patients ranging in age from eight to 68, Dr. Entin said the joints were taken from the patient's little toe in some cases. In others the joints were salvaged from fingers previously amputated from the patient.

There was no pain or discomfort during observation periods varying from six to 36 months, during which the joints were seen to be functioning satisfactorily.

X-ray showed some loss of normal shape but all the bones healed well. The reconstructed joints had a useful range of motion, between 10 and 30 degrees.

Dr. Entin said that although permanent "survival of the bone and joint component as an entity does not always take place," this is a practical procedure because of the painless aspects and the fact that some motion remains.

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## GEOPHYSICS

**Unusual Lightning Flash Lasts Two Seconds**

AN UNUSUAL lightning flash, consisting of a record 54 current surges that lasted two seconds, is reported by three New Mexico scientists.

Drs. E. J. Workman, M. Brook and N. Kitagawa of the New Mexico Institute of Mining and Technology, Socorro, found that the path length for the final strokes of the lightning flash was about five and a half miles. The number of strokes and the total duration are believed to set records.

Their scientific study of the flash, which occurred over New Mexico last summer, is reported in the Journal of Geophysical Research, 65:1513, 1960. The unusual event was photographed with two different moving-film cameras.

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## PHARMACOLOGY

**Test Effect of Drugs On White Blood Cells**

BECAUSE SEVERAL of the wonder drugs, especially sulfa, can dangerously reduce the white blood cell count, New York University's biology laboratories have developed a new simple technique to reveal such dangers in prospective drugs.

In the new method rats are first exposed to a sub-lethal dose of X-radiation. This dose reduces the white cell count. The drug is then given to some of the sensitized animals, while other exposed rats are kept as controls.

If the drug does have the potential of reducing the white cell count, the blood of animals both injected and radiated regains its normal count more slowly than the blood of the rats that underwent radiation only.

The technique was developed by Dr. Harry A. Charipper, head of NYU's all-university department of biology, Dr. Anna M. Slicher, former graduate assistant in the department, and Dr. Edgar N. Grise-wood, associate professor of physics at NYU's Washington Square College of Arts and Science and lecturer on radiology at the University's School of Medicine.

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## MEDICINE

**Vitamin Pill Substance Hides Pernicious Anemia**

A WEST VIRGINIA doctor wants manufacturers to leave the folic acid out of their multivitamin pills and iron tablets.

This substance, says Dr. A. B. Curry Ellison of Charleston Memorial Hospital, is capable of correcting the blood picture in patients with pernicious anemia. But it does nothing for the neurologic or gastric aspects of the disease.

When a doctor does not see the characteristic faulty blood picture, he spends precious time groping in the dark, trying to find the cause of the stomach and nervous trouble, not suspecting that folic acid has masked the pernicious anemia.

Folic acid has been included in vitamin preparations since about 1946, Dr. Ellison reports in the Journal of the American Medical Association, 173:240, 1960. Since that time six cases of folic acid masking have been reported by other workers and Dr. Ellison adds two more to the list for a total of eight.

The daily requirement of folic acid for the human being has not been determined, but on the basis of animal studies, one-tenth to two-tenths milligram per day has been suggested. If a patient needs extra folic acid, Dr. Ellison believes, he should take it as a separate pill.

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# CE FIELDS

## MEDICINE

### Blue Dye Test Detects Abnormal Tissue Protein

A DANISH DOCTOR has found a new way to detect amyloidosis, a condition that often precedes or accompanies diseases such as tuberculosis, osteomyelitis, lung abscess or gummatous syphilis. His technique uses blue dye rather than the presently used red dye.

In amyloidosis an abnormal protein complex with starchlike characteristics, called amyloid, accumulates in various body tissues. The usual method for detecting this condition is to inject Congo red dye into the blood stream. If the dye is cleared from the blood faster than normal, the patient is generally believed to have amyloidosis.

The point that doctors do not agree on is just how fast and how much of the red dye must be removed from the blood, Dr. Stig Jarnum of Bispebjerg Hospital, Copenhagen, believes.

Quite by accident Dr. Jarnum found that Evans blue dye, which is routinely used for blood plasma-volume determination, is removed at an abnormally high rate from the blood of amyloidosis patients.

The Evans blue diagnostic method may turn out to be more specific than the Congo red test, Dr. Jarnum reports in *The Lancet*, 1:1007, 1960. The reason, he reports, is that rapid removal of Evans blue can only be due to an abnormal non-circulating protein, amyloid, that can catch and hold the dye.

This diagnostic technique may be even better when used in conjunction with radioactive tracers. And it is particularly valuable when the patient is allergic to the Congo red dye.

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## SURGERY

### Hospital Coronary Unit Proposed to Save Lives

A CANADIAN surgeon proposes that every hospital set up facilities for emergency treatment of victims of coronary attacks.

These facilities would include two emergency rooms, and heart-specialist nurse, intern, and anesthetist.

If the attending physician were not available, this heart team would go into action without him.

Dr. W. Carleton Whiteside of Victoria, B. C., proposes the coronary unit in the *Journal of the International College of Surgeons* (May, 1960). The plan is especially for victims of coronary insufficiency in which portions of the heart muscle are suddenly starved and die. A blood clot in the heart's own arteries, or hardening of these arteries, or both, can bring on this attack.

Under Dr. Whiteside's plan, a patient would be rushed to the local unit, where morphine and oxygen would be given to relieve pain and shock. Then because of the lowered output of the heart, he would be covered with ice blankets to lower his temperature.

In this modified form of suspended animation, his metabolism would be slowed to a level his weakened heart could maintain. Dr. Whiteside reports this could be kept up for several days if necessary. In extreme emergencies the patient's chest would be cut open and his heart massaged by hand.

"No one will be accused of a crime for trying to restore life. Three to four minutes can mean the difference between life and death in such situations," he points out, adding that it would often be fatal to wait for a surgeon.

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## GEOPHYSICS

### Sputnik III Measures Oxygen in Ionosphere

THE RUSSIAN SATELLITE Sputnik III has measured atoms of oxygen called atomic oxygen at altitudes between 135 and 590 miles, the National Aeronautics and Space Administration has reported.

Nitrogen oxide, molecules of nitrogen and atoms of nitrogen were also found at the same altitudes, a Russian report, translated by NASA, said.

Data obtained by the Sputnik at latitudes 27 to 67 degrees north showed that the composition of the ionosphere at these altitudes differs with latitude. The relative density of oxygen atoms appeared greater at latitudes ranging from 55 to 65 degrees north than in the latitudes farther south. This was also true of molecular oxygen and nitrogen oxide.

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## ROCKETS AND MISSILES

### Helicopter System To Save Boosters

A HELICOPTER-LIKE system could be added to the main stage of a rocket and would permit the rocket engine to glide back to earth for re-use. This would save millions of dollars.

As proposed by engineers of the Bell Helicopter Corporation, a control system would automatically activate rotor blades once the first stage is free of the rest of the rocket so it could float to earth while buoyed by auto-rotating helicopter blades. Preliminary studies of the system have been reported. For slowing or controlling descent, the operation of the rotor blades could be controlled from the ground so that the booster could be guided back to the launching point or directed to an auxiliary landing pad elsewhere.

All the development costs involved in the rotor system would be paid for by the savings from the first rocket engine re-used.

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## ROCKETS AND MISSILES

### Device Slows Fast Rockets To Protect Nose Cone

A MEANS of slowing down the fastest rockets and jet planes has been patented. The purpose of this device, which was granted patent No. 2,936,710, is to slow down a missile sufficiently to allow the use of a parachute and at the same time to protect the nose cone of the missile in which instruments may be housed.

William Bollay of Pacific Palisades, Calif., the inventor, assigned his patent to the Curtiss-Wright Corporation of Delaware.

The device consists of a cylindrical shell fitted around the body of the missile just behind the nose cone. When not in use, this shell fits flush with the surface and offers no more air resistance than would the normal skin of the missile.

To decelerate the missile, this cylinder is thrust forward by rods attached to a high pressure piston and cylinder within the body of the missile until the front edge is level with the nose. This forms an air pocket in front of the missile to slow down the missile's flight and at the same time to destroy the aerodynamic lifting properties of the nose cone.

Science News Letter, June 4, 1960

## SURGERY

### Refrigeration Preserves Kidney During Surgery

A HUMAN KIDNEY can be refrigerated and preserved during surgery with a new device that uses the same principle which helps to condition the cabin air of modern aircraft.

The technique was developed in a cooperative program between Dr. Abraham Cockett of the division of urology of the University of California Medical School and the Garrett Corporation, both of Los Angeles.

The unit, which operates on the principle of air-to-liquid heat exchange, is a stainless steel container about the size and shape of a kidney and lined with surgical sponge.

Through a special inlet and outlet, a water-alcohol solution can be circulated through the hollow walls of the unit.

During surgery in which blood flow to the kidney must be temporarily interrupted, the device is fitted around the kidney. A circulating refrigerant keeps the kidney at temperatures between 55 and 68 degrees Fahrenheit.

Thus the kidney tissue, which ordinarily deteriorates rapidly when its blood supply is interrupted, is preserved until circulation is restored.

In cases where half of the kidney must be removed because of disease, a special half-size unit is placed around the normal half of the kidney.

Other surgical procedures in which the device is used are in removal of fatty plaques from the kidney artery and in certain types of abnormal surgery in which the kidney artery must be clamped.

Science News Letter, June 4, 1960