

MEDICINE

Repair Human Bladder With Transplants

► **DAMAGED PORTIONS** of the urinary tract can be repaired by using segments of the small intestine.

A team of urological surgeons at the University of California Medical School, Los Angeles, headed by Dr. Willard E. Goodwin and including Drs. Roderick Turner and Chester Winter, have employed several surgical techniques using loops of small intestine (ileum) to repair ravages of disease or injury in the urinary tract.

In one such procedure the piece of intestine is used to repair or enlarge a damaged bladder. A "cup" is formed from the loop of small intestine taken from the patient. The bladder is then opened and the cup is sewn to the bladder, becoming the dome or top portion of the bladder.

Thus the capacity of the bladder, which had become limited through disease or injury, is restored to near normal, and the patient is greatly relieved.

Another procedure utilizes the intestinal segment to replace a damaged ureter (the tube which drains the urine from the kidneys into the bladder).

Use of intestinal segments in urological repair is not a brand new concept, Dr. Goodwin pointed out. This type of surgery was tried and abandoned more than 50 years ago. Only in recent years has it received renewed attention.

These procedures have been used successfully on approximately 50 patients at UCLA.

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MEDICINE

Physician's Burned Hand Leads to New Treatment

► **THE PAIN** of burns can be lessened and healing speeded by immediate treatment with ice water, a physician has accidentally discovered.

Dr. Alex G. Shulman of Los Angeles began this treatment eight years ago after he burned his own hand with boiling grease.

"In the ensuing agonizing few minutes," he said, "it seemed logical to plunge the hand into a tub of cold water."

Dr. Shulman found that after about an hour's immersion his hand could be removed without further pain of any consequence and that the burn seemed to heal more rapidly than he expected.

He reports in the *Journal of the American Medical Association*, 173:1916, 1960, that since his accident he has successfully used ice water as an initial treatment of 150 patients for burns of all degrees but covering less than 20% of the body.

The treatment should be begun at once, but if patients come in already bandaged, Dr. Shulman soaks off the dressings under ice water and continues the immersion from 30 minutes to five hours. Pain may return as the water becomes warm but the addition of ice cubes gives continued relief.

No infections occurred in patients treated within one hour after the burn.

The physician adds hexachlorophene to

the ice water in a basin, or if burns of the head, neck, shoulders, chest or other parts of the anatomy make immersion impractical, he applies towels chilled in the disinfected solution.

Dr. Shulman has observed that the usual inflammation following the burn can be reduced and at times stopped by ice water therapy. He says:

"While the value of this mode of therapy for patients with extensive burns in shock remains to be tested on a large scale, its merits for those with burns of lesser degree should not be doubted."

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METEOROLOGY

Storm Waves Forecast By Electronic "Brain"

► **A FAST, ACCURATE** method of forecasting hurricane-caused storm waves, the biggest killer when tropical storms hit the mainland, has been developed at Texas A. and M., College Station, Texas.

The method gives more reliable estimates of the period, height, and place and time of contact of storm surges caused by hurricanes and other meteorological conditions.

Dr. Basil W. Wilson, professor of engineering oceanography at Texas A. and M., said an IBM 704 computer has been used to spell out the direction of attack, the height of the wave at any given point along the fetch line, the velocity of the wave crest, the rate of change of the wave action as the hurricane progresses, and the rate of movement.

Since the information required to calculate these factors is not available while a hurricane is in progress, Dr. Wilson proposes to plot a number of previous hurricanes, then store these models in the computer. As a new hurricane developed, data on it would be fed to the computer, which would automatically match up the new hurricane with the one in its memory having the most similar characteristics.

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ENGINEERING

Engineers Promote Astronaut-Technician

► **A TECHNICIAN** trained to make spaceship or satellite repairs would make a top-notch astronaut, three engineers told the Pacific General Meeting of the American Institute of Electrical Engineers in San Diego, Calif.

The United States currently is training seven Mercury astronauts, all test pilots with engineering backgrounds. But M. A. Grodsky, Girard W. Levy and Robert D. Sorkin, all of the Martin Company in Baltimore, Md., said a technician in a satellite could detect and repair system malfunctions.

They said such a technician would require extensive training, probably with an earth-bound model of the unit he will later work with in space. But they believe adding a technician could provide a payload saving because of the versatility of such a worker.

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IN SCIEN

ASTRONOMY

Largest Known Shower Of Cosmic Rays Seen

► **THE LARGEST** and most "powerful" cosmic ray shower ever observed has been recorded by scientists at the Massachusetts Institute of Technology, Cambridge, Mass.

It confirmed evidence that some cosmic rays come from outside the Milky Way galaxy in which the sun and its planets, including earth, are located. The very high energy shower was analyzed by Drs. John Linsley and Livio Scarsi, who are stationed at M.I.T.'s research station in New Mexico.

The cosmic ray shower occurred about midnight on Dec. 3, 1959. Scientists have been analyzing results since then. In a period of only ten-millionths of a second, about ten billion atomic particles rained down on the New Mexico station's detectors.

The scientists estimate that the primary cosmic ray causing the shower had an energy between 20 and 40 billion billion electron volts. Cosmic rays are particles from space constantly bombarding the earth's atmosphere.

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ASTRONAUTICS

"Paraglider" Passes Re-entry Test

► **ASTRONAUTS** could glide back to earth on a flexible "paraglider," a cross between a parachute and a glider, studies reported to the National Aeronautics and Space Administration show.

The glider is so simple it looks like something a boy might devise to glide off a garage roof: a flexible wing with rigid leading edges. A space capsule with an astronaut inside could be suspended below the glider.

NASA has been looking for a low-weight device to slow the speed of re-entry so that a space capsule does not burn up from air friction. The paraglider is light and could remain compactly folded until needed.

Research has shown that maximum re-entry temperatures could be held as low as 1,500 degrees Fahrenheit by the paraglider.

A paraglider of a nonporous material such as aluminum alloy would slow re-entry much better than a conventional parachute at supersonic speeds, wind tunnel tests demonstrated. At these speeds, parachutes exhibit a pumping action that makes them bounce their cargo dangerously.

The research was conducted at the Langley Research Center at Langley Field, Va., by Francis M. Rogallo, John G. Lowry, Delwin R. Croom and Robert T. Taylor. They report that several methods of packing and deploying the paraglider have been successfully demonstrated.

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CE FIELDS

GENERAL SCIENCE

"Science City" Proposed; Would Include Academy

➤ LEGISLATION to build "Science City, U.S.A." will be introduced in Congress next January by Rep. Victor L. Anfuso (D-NY), a member of the House Committee on Science and Astronautics. The proposed legislation has the support of Sen. Lyndon B. Johnson, Democratic candidate for vice president.

Rep. Anfuso told SCIENCE SERVICE that much planning and research had gone into the preliminary drafting of the bill to create the Government-sponsored scientific research and education center "to be dedicated to peace and human welfare." He is still working and incorporating proposals that will make "Science City" the greatest scientific research center in the world.

A bill to establish a National Science Academy for science studies, on the order of West Point and Annapolis, was introduced this session by Rep. Anfuso. He emphasized that the proposed Science Academy would be non-military in nature but like the military academies would be wholly supported by Federal funds.

Science City would include in its area the National Science Academy. The Academy, as outlined in the bill, would have a graduate as well as an undergraduate program of study. It would have access to all the research going on within Science City: astronauts, bio-sciences, physics, electronics, mathematics, geophysics, oceanography, meteorology and many others. The Academy also would provide fellowships to foreign students, to be admitted on an exchange basis.

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NUTRITION

Nursing Mother Will Use Own Calcium for Baby

➤ THE OLD BELIEF that a pregnant or nursing mother will steal from her own body to supply her baby with needed calcium has turned out to be scientifically correct, at least for rats.

This fact, differing sharply from recent findings on other essential nutrients, was confirmed in a research report presented at the Fifth International Congress on Nutrition in Washington, D. C.

The report tells of experiments conducted on pregnant and lactating mother rats and their young by two University of California scientists, Dr. C. Willet Asling, professor of anatomy at Berkeley, and Dr. Marjorie M. Nelson, lecturer in anatomy at Berkeley and the San Francisco Medical Center.

While results of the calcium study agree with widespread popular opinion, other findings in this area of science have shown

that the old rule of thumb about mothers supplying all the nutrients needed by their young cannot always be trusted.

One recent study by Drs. Asling and Nelson showed that severe prenatal deficiencies of folic acid, a B vitamin, can cause serious deformities in the newborn.

Two groups of rats were used in the calcium experiment, all given identical food, except that the diet of one group was deficient in calcium. As offspring were born and weaned, mother and baby rats were studied by means of X-ray techniques and their bones were measured and examined microscopically.

The researchers found that neither the mother rats nor the young showed any differences in skeletal growth or maturation that could be attributed to calcium-deficient diets. Nor did the young in deficient group show any shortage of calcium or less of density in their bones.

The calcium-deficient mothers, however, showed marked effects of skeletal demineralization, indicating that calcium had been taken from their bones to provide adequate supplies for their unborn or nursing young.

The California scientists reported that "it was possible to demonstrate a reduction in maternal bone density to 83% of the normal value when the calcium deficiency occurred only during lactation, and a further reduction to 73% when the deficiency started at the beginning of pregnancy."

While the popular notion about mothers compensating for a lack of calcium has been verified, another widespread idea about mothers losing "one tooth per baby" appears to lack confirmation in modern research, Dr. Asling has said.

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AGRICULTURE

Plastic-Coated Fertilizer For Controlled Growth

➤ PLASTIC-COATED fertilizer capsules may be used on some crops in the future to provide controlled release of plant nutrients.

Soil specialists O. J. Attoe, L. E. Engelbert and W. C. Dahnke of the University of Wisconsin, Madison, Wis., said that such controlled release of nutrients could be highly valuable in fertilizing grass for pastures, lawns and golf courses. The fertilizer effects would be spread over a longer time, supplying nutrients as they are needed throughout the growing season, rather than providing a surplus right after fertilizing and a shortage later in the season.

In experiments, the three researchers found that plastic-coated fertilizer capsules gave a much more uniform growth of grass throughout the growing season. In regular fertilizing, the part of the fertilizer which is not used in the first crop is only partly available to succeeding crops, because water, soil bacteria and minerals in the soil remove some of the nutrients or make them unavailable to plants. A slow release of the nutrients would help overcome this.

Mechanical details will have to be worked out and tested before the process of plastic coating can be practical for fertilizer manufacturers, the researchers said.

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GEOPHYSICS

Nuclear Detonations Detected the World Over

➤ NUCLEAR DEVICES exploded high in the atmosphere above the southern Atlantic Ocean in the Argus project produced geomagnetic disturbances that spread to almost all parts of the world.

Drs. W. K. Berthold, A. K. Harris and H. J. Hope of the U. S. Army Signal Research and Development Laboratory, Fort Monmouth, N. J., report in the Journal of Geophysical Research, 65:2233, 1960, that the geomagnetic variations were recorded principally by induction-type magnetometers and earth-current stations. The variations had a period of one to three seconds.

Signals from the Aug. 27 to Sept. 6, 1958, detonations were detected in such scattered areas as Arizona, Maine, Iceland, Sweden, the Azores, France, equatorial Africa, the southern Indian Ocean and Antarctica.

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NUTRITION

Men Need More Food In High Temperatures

➤ MEN NEED MORE food when they live in extreme heat than when they live in moderate temperatures, an Army study at Yuma, Ariz., has shown. The study upsets older theories that men's caloric requirements are higher in cool weather.

Personnel of the U. S. Army Medical Research and Nutrition Laboratory at Fitzsimons General Hospital in Denver made the studies with eight conscientious objectors who volunteered as test subjects.

In one ten-day experimental period, the men worked and ate in the hot sun, at 105 degrees Fahrenheit. In a second period they worked and ate in hot shade, 104 degrees. In a third, they were in an air-conditioned room, 78 degrees.

The men could eat all they wanted at all times. Food intake per man per day was 400 calories higher in the hot sun and hot shade than in the cool room. The men gained weight slightly in the heat because of a gain in the fluid held in their bodies. But this fluid gain exceeded the total weight gain so that the men actually lost body tissue during the hot periods, presumably to satisfy the energy requirements of their bodies.

The researchers say that in all likelihood the increased requirements resulted from a combination of such factors as increased action of the blood in heat transport, increased action of the sweat glands, increased caloric loss because of sweat vaporization and increased metabolism because of the elevation in body temperature.

The study was reported at the Fifth International Congress on Nutrition in Washington, D. C., by C. Frank Consolazio, chief of the bioenergetics division of the Laboratory. Working in association with Mr. Consolazio were Ralph Shapiro, John E. Masterson and Philip S. L. McKinzie.

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