

MEDICINE

Cortisone Saving Babies From Rh Blood Death

► CORTISONE, FAMOUS for its relief of painful, crippling arthritis, has saved 75% of babies who otherwise would have died Rh blood deaths.

These "encouraging" results, obtained in 70 cases, were reported by Dr. Oscar B. Hunter Jr., of Doctors Hospital Research Foundation in Washington at the meeting of the Medical Society of the District of Columbia.

The cortisone is given to mothers who have previously had still-born babies because the Rh factor in the mother's blood was incompatible with that of the baby. It is given during the last three or four months of pregnancy.

When to start the cortisone treatment and what sized dose to give are determined by tests of excretion of two hormones from the mother's body. The hormones are 17-ketosteroids and pregnandiol, an end-product of progesterone.

By following the excretion of these two hormones during the last months of pregnancy, Dr. Hunter finds he can tell how the baby in the mother's womb is thriving. If it is not doing well, it is time to start the cortisone treatment of the mother. Subsequent improvement in the unborn baby's condition can be seen through the mother's hormone excretion.

Since he has been using this hormone check, Dr. Hunter finds he gets better results in helping the mothers to deliver living babies.

Reason for giving cortisone is because it can prevent hypersensitivity reactions, which are what occur when mother's and baby's blood are not compatible in the Rh factor.

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ENGINEERING

Spinning Wheel Powers New Swiss "Gyrobust"

► A SPINNING wheel has become the sole power plant in a new Swiss bus that can zoom along silently at a 30-mile-an-hour clip.

The spinning wheel, however, is not the kind great-grandmother used to wind cotton, wool and flaxen fibers into thread, but a 3,300-pound gyroscope rotor.

Whirling in its hydrogen-filled cage at 3,000 revolutions a minute, the heavy rotor turns an electric generator that feeds driving motors on the bus wheels. Once brought up to speed, the rotor will revolve for hours since friction is held to a minimum. But it can power the bus for less than four miles before it has to be "recharged."

To speed the rotor back to a comfortable 3,000 rpm, the motorman drives into a recharging station supplied with commercial three-phase 380-volt electric power. He

presses a button and three antenna-like probes rise on the top of the bus to engage the power station's electrical contacts.

In half a minute to three minutes, the flywheel again is spinning fast enough to power the bus another three and a half miles at 30 miles an hour.

Built by the Oerlikon Engineering Company in Zurich, the 50-passenger bus requires no rails or trolley wires, making its initial cost relatively low. "Recharging" stations are inexpensive to build and require little equipment. Passengers enthusiastically report the bus provides a vibrationless, noiseless, odorless ride.

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SURGERY

Radioactive Pills in Brain to Check Cancer

► SURGERY OF the future may include: tiny pellets of radioactive yttrium implanted in the brain to check spreading cancer; lead shields around the spleen to make possible cancer-curing X-ray doses for children; and skin grafts from the dead for badly burned patients. Steps toward these were reported at the American College of Surgeons meeting in Chicago.

The radioactive yttrium pellets would be used because they give off beta rays which penetrate only a short distance. Implanted in the brains of monkeys, they are able to destroy the pituitary gland, Drs. Theodore Rasmussen and Paul Harper of the University of Chicago reported.

Removal of the pituitary by surgery is difficult because of its location in a bone at the base of the brain. Doses of X-rays or radium that would destroy it also would damage neighboring brain tissue. So if removal of this gland can check cancer spread, as some believe, the beta rays from radioactive yttrium may be the answer. At the least, they may show whether this approach to stopping cancer will work.

Lead shielding around the spleens of dogs saved them from X-ray doses that would kill unshielded animals, Drs. Winfield L. Butsch, G. N. Scatchard, S. Anthonie and J. B. Drumm of the Buffalo, N. Y., General Hospital and Children's Hospital, Buffalo, reported. If a way can be found safely to wrap the lead around the spleens of children, it may in future be possible to give them big enough doses of X-rays to cure some cancers of the nervous system and lymph glands. So far, however, no human application of the work has been made.

Human skin from patients recently dead is being grafted on mice in laboratory experiments to determine how long such transplants will live, Drs. James Barrett Brown, Minot P. Fryer, Milton Lu and Peter Randall of Washington University, St. Louis, reported. They hope to learn from these experiments whether skin from the dead can be used to save victims of bad burns.

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IN SCIEN

SURGERY

Stitch Wounds With Stainless Steel Wire

► FOR SEWING up abdominal wounds in complicated cases where the wound might pull apart, stainless steel wire gives good results, Drs. Clarence Dennis, Carlton A. Nelson and Frank B. Ankner of the State University of New York College of Medicine, New York, reported at the meeting of the American College of Surgeons in Chicago.

They have tried it in more than 100 cases in the past three years. Patients report less discomfort than with standard silk stitches. Only one separation of the wound occurred but the steel wire held it enough to keep internal organs from pushing through. One late hernia was seen but no other complications.

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SURGERY

Big Shock Needed To Calm Big Hearts

► BIG HEARTS need bigger electric shocks to calm them than normal sized hearts, University of Pennsylvania surgeons reported at the meeting of the American College of Surgeons in Chicago.

Electric shock has long been used to synchronize heart muscle fibers when they have gotten to twitching irregularly in the condition doctors term ventricular fibrillation. The condition starts suddenly and may be fatal if the abnormal twitching is not stopped, since heart muscle fibers must work together to pump blood through the body.

Regular house current, 110-115 volt, 60 cycle AC, is usually strong enough to defibrillate a heart of about normal size. But for enlarged hearts it may not be enough even when given repeatedly. Using a larger current can be dangerous because it might burn the heart.

Heavier current can be used safely, the Pennsylvania researchers found, if the shock is given for just a tenth of a second at a time. A push button could be used for this, but the surgeons pointed out that it would take training to operate it at the right speed and, under the stress of trying to defibrillate a human heart, the push button operator might not be able to time his speed accurately enough. They are looking now for a mechanical way of controlling this.

The team working on the problem consists of Drs. Charles K. Kirby, Julian Johnson, Joseph Engelberg and Roberto Rovis.

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CE FIELDS

ANIMAL NUTRITION

Chicks Need Vitamin K When Fed Antibiotics

► POULTRY RAISERS feeding their chicks some of the newer growth stimulators and disease-fighting chemicals should also give the chicks some vitamin K to prevent bleeding.

Vitamin K is necessary for normal blood clotting. Chicks synthesize it in their intestinal tract. But chicks fed on modern rations have been turning up with hemorrhages under the skin, sign of vitamin K deficiency, as early as three weeks after hatching.

Scientists at the University of Illinois and the Agricultural Experiment Station tested various chick diet supplements and found that terramycin and arsonic acid prolonged the blood clotting time significantly, and that arsanilic acid might do so.

The exact mechanism is not yet known but these supplements could act either by affecting the bacteria that synthesize vitamin K in the intestinal tract or by acting as antagonists to it.

The use of greater amounts of solvent extracted soybean meal and lesser amounts of alfalfa would, the scientists point out, tend to reduce the amount of vitamin K in the chick's ration. At the same time growth stimulating and other drugs affect the vitamin K normally synthesized.

The experiments are reported in *Science* (Oct. 2) by Drs. P. Griminger, H. Fisher, W. D. Morrison, J. M. Snyder and H. M. Scott.

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SURGERY

Seek Extract From Hibernating Gland

► PATIENTS UNDERGOING heart operations at some future date may get injections of hibernating gland extract or a synthetic duplicate so surgeons can "refrigerate" these patients for safer operations.

Steps toward this were reported by Drs. G. A. Trusler, J. M. McBirnie, F. G. Pearson, A. G. Gornall and W. G. Bigelow of the University of Toronto, Toronto, Can., at the meeting of the American College of Surgeons in Chicago.

The technique of inducing very low temperatures has been investigated during the past six years as a means of letting the surgeon look into the heart as he operates instead of feeling his way. At the low body temperature, blood flow is slowed to such an extent that this can be done.

In the hope of making the refrigeration technique safer, the Toronto scientists have

studied hibernating animals such as the ground hog. These animals can be cooled to as low as 37 degrees Fahrenheit and a two-hour heart operation performed on them safely. But humans cannot be cooled to below about 75 degrees Fahrenheit without risk of heart stoppage or dangerous heart rhythm upset. Normal body temperature in humans is 98.6 degrees Fahrenheit.

The ground hog's cold tolerance, the Toronto scientists believe, is due to a brown fatty tissue that they think acts as a hibernating gland. When they cut out about half of this tissue, the "deglanded" ground hogs could not stand low temperatures as well as with all the gland intact.

For two years the Toronto scientists have been trying to find an extract of this hibernating gland tissue that could be used in laboratory rats to increase their tolerance to cold. If found, such an extract might be purified or a chemical duplicate made for use on humans. The work so far has not reached this stage, but studies of the ground hog are expected to show more about how to refrigerate humans safely.

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PSYCHOLOGY

Eyes Can Take It If Homework Longer

► MANY BOYS and girls will be spending longer hours on their homework, if teachers follow the findings reported by Dr. Leonard Carmichael at a seminar at Jackson Laboratory, Bar Harbor, Me.

Dr. Carmichael is secretary of the Smithsonian Institution in Washington, D. C., a member of the Jackson Laboratory's Board of Trustees, vice president and chairman of the executive committee of SCIENCE SERVICE, and former president of Tufts College.

The studies he reported show that most persons can read uninterruptedly for six hours without actually suffering from eye strain or fatigue. This is true for persons reading from both the printed page and from microfilm.

A number of the high school and college students thought what they were reading was dull. These complained of feeling tired, of feeling eyestrain and of "wishing to stop." But the tests did not show any loss of measurable efficiency of reading or any change of understanding the material.

The 20 high school and 20 college students each spent six hours reading Adam Smith's economic treatise, *Wealth of Nations*, volume 2, and six hours reading Richard Blackmore's novel, *Lorna Doone*. Electrical devices gave continuous recordings of every eye movement of each student during each of the six-hour reading periods. The records totaled some 15 miles in length.

Besides suggesting that assignments might be longer than those usually given now, Dr. Carmichael recommended training students, especially in secondary schools, to disregard the tired feeling in reading, since it is only a feeling and not real fatigue.

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ENGINEERING

Floating Vacuum Cleaner Sweeps Out Canal Bottom

► CANADIAN ENGINEERS are using what is billed as the "world's largest dredge" to vacuum clean Quebec's 15-mile-long Beauharnois Canal so the Beauharnois powerhouse will get more water for its generators.

Driven by a motor standing 18 feet tall, the dredge's vacuum probe can "suck up" boulders weighing 1,500 pounds, General Electric engineers in Schenectady, N. Y., report.

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AGRICULTURE

Plant Diseases Cost U. S. Three Billions Annually

► BIOLOGICAL WAFARE is costing the American people an estimated \$3,000,000,000 a year. No human enemy can be blamed for this toll. The enemy is the army of fungi, viruses, bacteria, nematodes and other disease agents that lay waste our crops.

This "startling" figure is revealed by the Secretary of Agriculture, Ezra Taft Benson, in a foreword to the Department's Yearbook which this year is devoted to "Plant Diseases." (See p. 252.)

"The tragic aspect is that much of the loss is a waste that can be prevented," Secretary Benson said. "Waste is contrary to the laws of nature and the conscience of man. Waste is unworthy of a great people."

However, it will not be easy to conquer some of the plant diseases that plague us, he pointed out. Just when we think we have brought a disease under control, as in the case of rust, new forms or new races of old disease-producing organisms appear, and the battle must start all over again on a new front.

One obstacle to final victory is the lack of information about plant diseases among the persons who have to do with growing plants and making use of plant products.

Encouraging developments have been the perfection of varieties of wheat, oats, strawberries and other crops that can withstand, at least for a while, the ravages of a disease. More effective chemicals have also been discovered to add to our armament against plant diseases, but much remains to be done, Secretary Benson declared.

Foundation for the annual Yearbook of Agriculture was laid by Milton S. Eisenhower, brother of President Eisenhower, and editor of the Yearbook from 1928 to 1935. This volume summarizes the results of agricultural research conducted by the Department of Agriculture.

In 1952, the United States invested \$42,874,000 in various areas of such agricultural research. The book is prepared in clear language especially for the use of American farmers.

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