

## SURGERY

**Urge Amputation at Knee Instead of Thigh**

► WHENEVER POSSIBLE, leg amputations should be made at the knee joint rather than through the thigh, three Army surgeons urged at the meeting of the American Academy of Orthopaedic Surgeons in Chicago.

The Army surgeons are Col. Joseph W. Batch, Col. August W. Spittler and Capt. James C. McFaddin of Walter Reed Army Hospital, Washington, D. C.

They gave the following advantages of the knee amputation:

1. Since the thigh muscles are retained functionally, early fitting of an artificial limb is possible.
2. The knee stump assists both in the control of rotation as well as lifting of the artificial limb.
3. An excellent gait is obtained almost immediately.
4. Motion of the thigh is true hip motion and not a result of pelvic thrust.
5. Without the artificial limb, the amputee may kneel on a chair or on the floor in work or play.
6. Muscle and bone are not transected, thus minimizing the spread of infection after the operation.
7. The stump heals rapidly; is firm and insensitive.
8. An excellent fitting artificial limb is readily fabricated, which requires fewer adjustments and is superior to artificial limbs for higher levels of amputation through the thigh.

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## VETERINARY MEDICINE

**Distemper Virus Develops Into Several**

► JUST AS human influenza has three virus types to cause it, with new strains developing from time to time, so the similar disease in dogs, canine distemper, apparently has developed more than one virus to cause the disease.

Studies suggesting this are reported by Dr. N. M. Larin of the Canine Research Station of the Animal Health Trust, Newmarket, England, in *Nature* (Jan. 23).

Vaccines against distemper may need to be changed to include the new strains, just as vaccines against human 'flu have needed such changes.

Dr. Larin reports a study of 23 strains of distemper virus isolated from epidemics and sporadic cases in various parts of Britain during 1952-53. Their behavior in ferrets, he found, was so strikingly different as to justify grouping them into groups A, B and C strains.

Sickness with strains of group A lasted six to 14 days, while group B strains caused sickness lasting two to six weeks and group C strains caused sickness for three to 12 weeks.

The majority of ferrets sick with Group A strains had mouth sores, conjunctivitis and diarrhea, but did not lose their appetites until the last day or two before collapse and death. Loss of appetite occurred frequently in sickness with groups B and C strains, but the other symptoms developed only occasionally.

"It appears," Dr. Larin states, "that progressive and continuous changes have been occurring in the strains of distemper virus. The differences in the strains are sufficiently great to assume the plurality of virus and to warrant a periodic revision of components in the immunizing materials in order that the strains used may closely resemble the current strains infecting the dog."

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## MEDICINE

**Sucking Alkaline Tablets Relieves Ulcer Symptoms**

► GOOD RESULTS in ulcer symptoms from the sucking of alkaline tablets are reported by Drs. A. H. Douthwaite and M. G. Thorne of Guy's Hospital, London, in the *British Medical Journal* (Jan. 23).

A hint that these tablets may even prevent further trouble from duodenal ulcers appears in the doctors' carefully worded report, as follows:

"Their regular use in the symptom-free patient already seems to reduce the tendency to relapse. It would be unwise to put the case any more strongly than this for the present. It is hoped that significant results will be available after a five-year follow-up period."

The tablets contain milk solids combined with dextrans and maltose, magnesium trisilicate, magnesium oxide, calcium carbonate, magnesium carbonate and peppermint flavoring.

One of these tablets, if lodged between gum and cheek, takes 20 to 30 minutes to dissolve. Its food value is about 11 calories.

After good results from continuous sucking of these tablets in tests made during the digestion of gruel test meals, the two doctors tried them on 12 patients who were up and about and eating ordinary meals except that solid food was minced. In two cases, the patients were eating ordinary, unminced food. Tests were made on two days, during one of which the patients sucked dummy tablets containing no alkaline chemicals.

In every case the alkaline tablets brought a "considerable" neutralization of the acid in the stomach, which is generally considered desirable in treatment of ulcer patients. The dummy tablets did not do this. In some experiments sucking only one tablet an hour was effective, probably because the food eaten also reduced the acidity of the stomach contents.

Although patients could suck four tablets in an hour, the doctors do not think there is any danger of too alkaline a state developing if the daily dose does not exceed 15 tablets.

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**IN SCIEN**

## METEOROLOGY

**Air Pressure Jumps Spot Oncoming Tornadoes**

► APPROACHING TORNADOES can sometimes be spotted using a new, very sensitive instrument, four Lamont Geological Laboratory scientists reported to the American Meteorological Society meeting in New York.

The device, a microbarovariograph, spots very small changes in air pressure. Some of these changes, or jumps, were associated with tornado activity more than 90 miles away from Oklahoma City where the instrument was installed, they reported.

A chain of such devices would give observations "of great value," Drs. Maurice Ewing, Frank Press, Richard Rommer and William Donn believe.

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## PHYSICS

**Double Atomic Birth Gives Atomic Particles**

► DISCOVERY OF an artificial "twin" birth process of still puzzling particles within the atom has resulted from about eight months of operating the giant cosmotron of the Brookhaven National Laboratory on Long Island.

Dr. R. P. Shutt told the American Physical Society meeting in New York that it is now known that two particles, the relatively heavy hyperon and the lighter K particle, appear together when a proton smashes into a negative pi meson.

Heretofore, when the production of these very short-lived particles was known only from cosmic rays, physicists were troubled by their lifetime that they considered too long, even though it was only one ten-billionth of a second. The actual length of existence of the particles is made plausible by the production of the two particles in the same act.

Immense energies of the particles accelerated in the cosmotron made possible the artificial duplication of what the cosmic rays can do. The protons within the giant machine had energies of two and a half billion electron volts, while the pi meson was rated at one and a half billion electron volts.

Only several hundred K particles have ever been discovered in cosmic rays and they have never been found in pairs. The artificial production was detected by photographs of the tracks of the particles produced in a cloud chamber.

The K meson is 900 to 1,400 times the mass of the electron and the hyperon is 2,200 electron masses.

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# CE FIELDS

## ASTRONOMY

### Find New "Yardstick" For Galactic Distances

► A NEW "yardstick" for measuring the distances to other star systems, or galaxies, beyond the Milky Way is being investigated by Drs. G. de Vaucouleurs and C. S. Gum of the Canberra and Commonwealth Observatory, Mt. Stromlo, Australia.

Luminous hydrogen gas surrounding some nebulae is in the shape of rings or partial rings. In six different galaxies, including our own Milky Way, they find that the largest of these rings has approximately the same diameter. This, they point out, is "striking" because the galaxies represented in the six include both spirals, great pinwheels of stars such as the Milky Way and the Andromeda Nebula, as well as irregular, giant and dwarf systems.

Although the rings are not found in all galaxies, when they do occur, they offer an "excellent distance indicator," the two astronomers conclude. Examples of ring-shaped systems in our own galaxy are found in the constellation of Orion, the giant hunter, and Scorpius, the scorpion.

The diameters of the ring systems average about 85 parsecs, Drs. de Vaucouleurs and Gum report in the *Observatory* (Aug., 1953). One parsec is about 19,160,000,000 miles. If the largest ring-shaped object in other extra-galactic systems can be considered to have approximately this same, 85-parsec diameter, then the distance to that galaxy can be computed from its apparent diameter.

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## MEDICINE

### Blame Backache on Hardening of Arteries

► BACKACHES IN some cases are due to artery disease, Dr. George S. Phalen of the Cleveland Clinic, Cleveland, Ohio, declared at the meeting of the American Academy of Orthopaedic Surgeons in Chicago.

He compared the condition in which the patient has pain in the low back, hip or thigh with the cramp-like pain in the calf which comes on after walking a variable distance and is relieved promptly by standing still.

The calf pain is almost certain to be due to some interference with blood circulation of the lower leg, often the condition doctors call arteriosclerosis obliterans.

"Pain in the lower back, hip and thigh may be due to occlusive vascular disease such as arteriosclerosis obliterans," Dr. Phalen declared. "Patients who have this type of intermittent claudication will complain of acute cramping in the region of

the right hip, coming on after walking a short distance. This cramping pain becomes so severe that the patient must stop and stand still for a few minutes before the pain will be relieved sufficiently so that he can walk another short distance.

"The cramping pain in the muscles is due to the fact that these muscles are not receiving enough blood to enable them to carry out the work required of them. This type of pain always disappears with rest and always recurs with activity.

"It is imperative that the status of the circulation in the lower extremities be checked carefully in all patients complaining of low back, hip or thigh pain. Patients who have intermittent claudication of the hip have frequently been treated for other orthopaedic and neurosurgical conditions which they did not have, such as a protruded intervertebral disc or arthritis of the hip joint."

Dr. Phalen explained that a dye, opaque to the X-ray, may be injected directly into the aorta, the large artery leading from the heart. This will permit the taking of X-ray films which outline the blood vessels in the pelvis and legs. By means of these films, the exact location of the block in the arteries may be demonstrated.

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## SURGERY

### Chest Muscle Graft Aids Arm Weakened by Polio

► BY GRAFTING a pectoral muscle from the chest to the biceps, a group of San Francisco surgeons are giving polio patients arm strength and ability to move paralyzed elbows.

The operation and its results were reported by the group, Drs. E. R. Schottstaedt, Loren J. Larsen Jr. and Frederic C. Bost, at the meeting of the American Academy of Orthopaedic Surgeons in Chicago. Most of their work was done at Shriners Hospital, San Francisco.

Their first muscle transplant was done on an eight-year-old boy who, because of a palsy condition, was unable to bend his elbow. After a chest muscle was grafted to the biceps tendon, he was able to lift a three-pound weight throughout a full range of motion and, by resorting to trick motion, could lift a five-pound weight.

Best result, the surgeons said, was on a patient whose elbow-bending muscles were paralyzed by polio. As a result of the muscle grafting, this patient can lift a weight of five pounds throughout complete range and can hold eight pounds at 90 degrees, which is the point of maximum muscle efficiency.

In some cases results were not so good.

The transplanted muscles, even when effective, never equal in power the muscle being replaced or the transplanted muscle in its normal location. But in successful cases, patients can feed and dress themselves and care for many of their other daily needs even if they do not have great strength.

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## METEOROLOGY

### Winds Rush 220 MPH 50 Miles Overhead

► HIGH-ALTITUDE WINDS sweeping as fast as 220 miles an hour about 50 miles above the earth's surface have been charted from photographs of meteor trails, Dr. Fred L. Whipple of Harvard College Observatory reported to the American Meteorological Society meeting in New York.

These winds "change rapidly with altitude" at 50 to 70 mile heights, he said, the changes being so "surprisingly high" that a new explanation of the source of such wind energy must be found.

Photographs of identical meteor trains were made with wide-eyed, fast-reacting Schmidt and Baker-Super-Schmidt telescopes at two or more separated stations. From them the average wind speed at 50 to 70 miles above the earth was calculated to be 150 and 112 miles an hour, respectively.

A meteor train that is nearly horizontal, Dr. Whipple said, shows much smaller wind changes with distance than the trails of meteors that plunge through the earth's atmosphere at an angle. About half of the energy of motion of the high-altitude winds, he suggests, is contained in large-scale, systematic motions and the other half in eddies two to six miles deep and about 30 miles across.

Wind speeds of approximately 120 miles an hour at about 66-mile heights were also reported by Dr. N. C. Gerson of the Air Force Cambridge Research Center, Mass. He analyzed reports of amateur radio operators, or hams, who talked unusually long distances on the 50 megacycle band, to find how fast a layer of the earth's radio-reflecting roof known as sporadic E was moving.

Both of the wind-speed values reported agree with velocities obtained by radar-meteor and other methods.

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## MEDICINE

### Tests Show Cortisone Reaches Spinal Fluid

► CORTISONE, adrenal gland hormone famous as a remedy for arthritis and other diseases, normally gets into the spinal fluid, it appears from tests made by Drs. D. N. Baron and Denis Abelson at Middlesex Hospital Medical School, London. Dr. Abelson is now at Yale University School of Medicine, New Haven, Conn.

The spinal fluids they examined came from patients having spinal punctures done and fluid removed in the course of neurological examinations. Paper chromatographic methods were used to detect the presence of cortisone and hydrocortisone.

The "provisional identification" of cortisone in spinal fluid is important, the scientists point out in *Nature* (Jan. 23), because some workers have failed to find these hormones in normal blood plasma.

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