

## SURGERY

## Straighten Twisted Legs By Removing Calf Bone

► **DEFORMED LEGS** and twisted feet have been straightened by removing a tight band of useless fiber tissue from the calf of the leg, three New York surgeons told the American Academy of Orthopaedic Surgeons meeting in Chicago.

The fibrous band is all that remains of what should have been the calf bone, the smaller, outer bone of the lower leg. This bone does not develop embryonically the way it should, probably due to injury during the sixth or seventh week of prenatal life, Drs. T. Campbell Thompson and L. Ramsay Straub, Cornell University Medical College, New York, and Dr. William D. Arnold, Hospital for Special Surgery, New York, reported.

When this tight fibrous band is present, it creates tension much like that of a bow string. The result is a bowed leg and a foot that is twisted into a club shape or other deformed position.

By cutting out the tight band, the deformity can be corrected, they said. Although the operation does not correct the leg shortening that is found with this condition, it does enable patients to walk with ease and enjoy full activities in an elevated shoe or a simple elevated brace, they said.

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## PHYSICS

## Device Could Tell Tiny Temperature Changes

► **A DEVICE** so sensitive it could detect temperature changes of only a few degrees at great distances was reported to the American Physical Society meeting by Dr. Malcolm W. P. Strandberg of Massachusetts Institute of Technology.

He told how this amplifying device, called a Versitron, could be attached to a radar set, increasing the radiated power of the transmitter 1,000 times. Pushed to "absurd limits," he said, it would allow constructing an instrument that could detect miles away whether a soldier had a fever or not.

Its response to changes of a few degrees would take place within a fraction of a microsecond, which is a millionth of a second. Although Dr. Strandberg did not so state, such a device obviously could be built into an instrument to spot intercontinental missiles or any other object whose temperature differed by a few degrees from its surroundings. Thus it would find wide use not only for national defense but by radio astronomers studying the heavenly sources of radio waves.

Dr. Strandberg said the Versitron would be particularly applicable at frequencies typical of those used for television broadcasts and higher, including those for radar and microwave relay links. Its chief advantage is a very low level of "noise," called "snow" when it appears on a TV set.

Developing the device would be a prac-

tical application of theoretical and experimental research in paramagnetics, which is now being conducted under Dr. Strandberg's direction at MIT and which he described at the meeting in New York. Other laboratories are also doing similar research.

Conventional amplifiers now available use the current that results from the translational motion or flow of electrons in matter or space. The Versitron, meaning essentially "spin-tool," would use instead the electrons' spinning, gyroscopic motion in a magnetic field.

Research in both the United States and Russia, Dr. Strandberg said, has shown that paramagnetic materials absorb waves of radio and microwave frequencies when they are placed in a magnetic field. The absorption frequency depends not only upon the atoms and the crystal, but upon the applied magnetic field.

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## PUBLIC HEALTH

## Mad Bats Offer Clues About Spread of Rabies

► **MAD BATS**, infected with the dreaded rabies virus, have been discovered in many areas of the U. S., and public health officials hope that a study of them will throw new light on how this dangerous disease can be spread from animal to man.

Although the South American vampire bats have long been known to transmit rabies, it was never suspected that the insect-eating variety found in this country harbored the disease. But in Tampa, Fla., in 1953 the first rabid insect-eating bat was discovered, after it had bitten a human. Since then, 150 other rabid bats have been reported in this country, the Communicable Disease Center, Public Health Service, Atlanta, Ga., reported. The bats have been found from New York to California and from Michigan to Texas.

So far, four species of tree-living or solitary bats and nine species of colonial or cave-dwelling bats have been implicated.

These discoveries have stirred up a great deal of interest among public health officials, Dr. C. C. Dauer, medical adviser, U. S. Public Health Service, said.

"These bats do not present a public health problem of any great magnitude to humans," he said, "although they might be an important public health problem to animals."

There has been speculation for years about the source of rabies in wild animals, such as foxes and skunks, but the idea that bats are responsible has never been proved, he said.

Possibly these rabid bats have existed here in the U. S. all the time, and we have just come to realize it within the last few years, he said.

Domestic animals are not in any particular danger from bats either, Dr. Dauer added. Most of the bats prefer to live in isolation and would rarely come in contact with these other animals, he said.

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# IN SCIEN

## ASTRONOMY

## International Program For Observing Stars

► **AN INTERNATIONAL** program to chart the positions of 21,000 stars during the next five years is underway at 12 observatories.

The U. S. Naval Observatory in Washington will carry out most of the observations and will compile the final catalogue of positions for these stars. Since each star is to be observed ten times, the total number of observations, including those of fundamental stars, will amount to 260,000.

This international undertaking will provide astronomers with a precise reference system for determining proper motions, Dr. K. Aa. Strand, director of Northwestern University's Dearborn Observatory, Evanston, Ill., reports in *New Horizons in Astronomy*, first publication in a new series, Smithsonian Contributions to Astrophysics.

The values for stellar motions obtained from the survey are expected to shed light on the size of the Milky Way galaxy in which the sun, the earth and the other planets are located. The program is being coordinated with another underway at Lick Observatory, Mt. Hamilton, Calif., to determine proper motions of stars with respect to objects beyond the Milky Way.

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## MEDICINE

## Swollen Cell "Fingers" Impair Kidney Function

► **UNDER** the electron microscope, kidney cells seem to have "arms," "hands" and "fingers." And when disease sets in, the "fingers" may become swollen, thus impairing the normal functioning of the kidney.

This is the picture suggested by Dr. Daniel Pease of the University of California at Los Angeles Medical School.

Dr. Pease, professor of anatomy, is one of a few researchers in the country working medically with the electron microscope. He recently showed detailed pictures of kidney cells before the Council of High Blood Pressure Research, meeting in Cleveland.

The electron microscope studies have revealed that kidney cells have arm-like extensions. The "fingers" surround the exceedingly small blood vessels of the kidney where urine is formed.

One of the characteristics of the normal cells is that the "fingers" are fairly wide apart. It has been speculated that disease might swell the "fingers," causing them to come into contact with one another and impair their function.

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# CE FIELDS

## CHEMISTRY

## Reason Found for Light Hair in Mental Disorder

► PHENYLALANINE, an amino acid found in protein foods, is responsible for the light-colored hair found in an unusual mental deficiency disease, Drs. Masamitsu Miyamoto and Thomas B. Fitzpatrick, University of Oregon Medical School, Portland, report in the journal *Nature* (Jan. 26).

The disease, phenylketonuria, is a rare hereditary disorder in which the victim never develops normal mentality. It is diagnosed by the presence of phenylpyruvic acid in the urine, due to the body's inability to metabolize the phenylalanine.

More than three-fourths of those having the disease also have blond hair and light complexion. Some of them even approach albinos.

This lightness of hair and complexion results from a breakdown in the normal reaction between two body chemicals which form melanin, the pigment responsible for body color, the investigators reported.

Normally, melanin is formed by the action of the enzyme tyrosinase upon tyrosine, another amino acid. But when an increased amount of phenylalanine is present, as it is in patients with phenylketonuria, this reaction is inhibited and normal melanin formation cannot take place, the scientists believe.

These patients, when fed synthetic diets that are lacking in phenylalanine, begin to get darker hair. The hair also darkens if large amounts of tyrosine are given orally.

This takes place because the excess amount of tyrosine restores the normal ratio of tyrosine and phenylalanine in the body and results in normal melanin formation, the doctors reported.

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## MEDICINE

## Increase in Leukemia Death Rate Puzzling

► THE climbing leukemia death rate in five western states has scientists puzzled. Most possible explanations are still only question marks.

In the eight years between 1946 and 1953, Dr. Brian MacMahon of New York State University's College of Medicine, New York, reports that the leukemia death rate in Nevada, Utah, Arizona, Idaho and Montana has almost doubled. In Montana and Idaho the increase in the death rate from the fatal disease was more than that in any other state in the same or in the preceding eight years.

The increase is not due to changes in the age distribution of the population, Dr.

MacMahon states in the Public Health Reports (Jan.), published by the U. S. Department of Health, Education and Welfare in Washington.

Nor can it be definitely stated that it is caused by better diagnosis and reporting.

One possibility which proved to be baseless was the increased radioactivity in the area brought on by atomic tests in Nevada. Dr. MacMahon points out that the rise in leukemia death rate began in 1947-48, even before the great majority of the tests were started.

This possibility, that radioactivity has contributed to the increase in leukemia death rates, Dr. MacMahon says, can be eliminated.

At best, he finds, the trend in leukemia mortality in these states in the next few years deserves continued attention.

Dr. MacMahon also reports that there is a belt of high leukemia death rates stretched across the northern states, west of the Mississippi.

In plotting the geographic pattern of leukemia deaths in this country, Dr. MacMahon found Minnesota had the highest rate, 79.2 deaths per million, and Maine, the lowest, 50 deaths per million.

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## SURGERY

## Crippling of Crushed Hands Prevented

► AN INJECTION of the enzyme hyaluronidase can prevent the permanent crippling of hands and fingers that have been accidentally crushed, Dr. Carl E. Nemethi of California Lutheran Hospital, Los Angeles, reported to the American Society for Surgery of the Hand meeting in Chicago.

Hyaluronidase prevents or decreases the swelling that takes place in injured tissue, an occurrence which restricts the blood supply to the injured area, Dr. Nemethi reported. This blood supply decrease is believed to be a factor in crippling, he said.

Hyaluronidase was used in about 200 cases and helped reduce the post-operative pain and permitted hand motion necessary for maximum recovery.

One case described was that of a 32-year-old factory worker whose hand was crushed when 1,000 pounds of steel fell upon it. The preservation of a blood supply gave him a useful hand after an accident which might otherwise have resulted in amputation, Dr. Nemethi said.

He also emphasized that surgical and medical care should be given "within minutes and not hours following injury."

"In a majority of cases the patient is made comfortable by aspirin, eliminating the need for narcotics, barbiturates or derivatives," he said.

On the first post-operative day all of them exercised their fingers and thumb freely without restrictive motion pain, and most of them returned to work on the second or third day to one-handed jobs, using the uninjured hand, he said.

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## MEDICINE

## Tranquilizing Drug Slows Cancer Growth

► RESERPINE, one of modern medicine's most famous tranquilizers, is also effective against leukemia in mice, researchers at the National Institutes of Health, Bethesda, Md., report in *Science* (Jan. 25).

A single injection of the drug almost tripled the remaining lifetime of mice in advanced stages of leukemia, after having received an inoculation of leukemic cells.

Aside from extending the lifetime of the mice, the drug also had a marked effect upon the size of the local tumor which developed at the inoculation site. Two days after reserpine treatment, the tumor had ceased to grow, and from then on its decrease in size was proportional to the drug dosage.

These local tumors frequently seemed to disappear completely after reserpine treatment. "However, transplantation of spleen from several such mice resulted in leukemic growth, indicating that 'systemic infiltration' had not been wholly suppressed," the scientists report.

The high doses of the reserpine used created severe depressions in the animals, however, and all of them lost an average of 30% of their total body weight. But when this depressant effect was counteracted with another drug, the antileukemic action still remained, the scientists say.

Although not as active an antileukemic drug as amethopterin, reserpine and several of its derivatives now make available new antileukemia agents for laboratory study, the investigators report.

Drs. Abraham Goldin, Stewart R. Humphreys, and John M. Venditti, National Cancer Institute, and Dr. Robert M. Burton, National Institute of Neurological Diseases and Blindness, National Institutes of Health, Bethesda, Md., report the studies.

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## PHYSICS

## Final Planning for Giant Accelerator

► FINAL plans are being made for construction at the James Forrestal Research Center, Princeton, N. J., of a three-billion-electron-volt particle accelerator that will cost more than \$6,000,000.

The new machine, largely financed by the Atomic Energy Commission, will be run jointly by Princeton University and the University of Pennsylvania. It will be used for unclassified research on the basic structure of matter.

The proton accelerator is designed to produce heavy mesons in much larger quantities than heretofore available, and to produce at least 50 times the proton current now available.

Architect-engineers for the three-year construction project are Gibbs & Hill, Inc., New York.

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