

## SEISMOLOGY

## Test Method for Predicting Earthquakes

➤ A NEW METHOD that may result in a way of predicting earthquakes will be tested during the International Geophysical Year now in progress.

Using a "linear seismometer," Dr. Hugo Benioff of the California Institute of Technology will measure the accumulation of strain in the earth's crust in the Andes Mountains. Earthquakes occur when the accumulated strain is released.

Only two of the instruments exist. Dr. Benioff will make the measurements with them in sharply contrasting terrain, very high mountains and neighboring lowlands, Huancayo, Peru, and Santiago, Chile.

Results of his program will undoubtedly turn up in the *IGY Bulletin* (July), a new publication by the U. S. National Committee for IGY.

The Bulletin will attempt to present information in each of the disciplines of the IGY program and in such areas as the Antarctic where regional features are important.

Another study in the Andes, using dynamite charges, is expected to show how deep the earth's crust is there. In preliminary studies in the United States, scientists found the Colorado Plateau and Rocky Mountains do not have great roots reaching down some 45 miles, as would be expected from their heights. Instead the continental crust there is hardly different from that of the lowlands, about 18 miles thick.

To check this surprising finding, Dr. Howard Tatel and Dr. Merle Tuve, director of Carnegie Institution's Department of Terrestrial Magnetism, will set off a large number of dynamite charges in the Andes, then tune in on the reflected waves. This will tell them the crustal depth.

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## PHYSIOLOGY

## A-Bomb Fails to Alter Fingerprint Pattern

➤ THE DISTINCTIVE patterns of a man's fingerprints are not destroyed or changed even by the searing heat or terrible radioactivity of an atomic bomb.

This is demonstrated by a study of the before-and-after fingerprints of criminals and police officers who were victims of the atomic bomb explosion in the vicinity of Hiroshima, Japan. T. Dickerson Cooke, editor of *Finger Print and Identification Magazine* (June), reports the study. The study was made by Murakami Keitaro, an identification technician of the National Police Agency, Tokyo.

Two ex-convicts who had been injured in the explosion and who had been arrested again and fingerprinted later on were located. One had been about a mile and a quarter from ground zero at the time of the explosion. The other was only about 1,000 feet away. In neither criminal was there any change in the fingerprint patterns.

Two police officers were also located for

the study. One man had his left hand so injured by the radiation that three of his fingers were permanently curved inward. But, again, no change had occurred in the fingerprint ridges. The hands of the other officer were badly scarred on the backs, but the fingerprints were not changed or obliterated.

Even if the finger ridges themselves were burned badly enough to cause scarring, Mr. Keitaro concludes, the prints will show scarred impressions of the original patterns. The radiation cannot destroy the ridges or change the patterns into new or different designs.

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## BIOLOGY

## Disorder Makes Person Sleep While Talking

➤ ABNORMAL SLEEPERS who doze off at such embarrassing moments as when eating, talking, or taking a shower are more common than generally believed, Drs. Robert E. Yoss and David D. Daly of the Mayo Clinic, Rochester, Minn., report.

This uncontrollable urge to sleep, known as narcolepsy, is far from being rare and the victim's drowsiness may be noted by his relatives long before he is aware of it himself.

Most narcoleptics go through a varying number of almost irresistible episodes of actual sleep during the day. Between spells, they are apparently alert and many deny actually sleeping, although they do admit fighting a constant battle against sleepiness during the day.

One of their most serious problems is a tendency to fall asleep while driving. Many learn to stop their car when they get drowsy and take either a short nap by the roadside or a brisk walk.

One symptom of the disorder, known as cataplexy, is shown when the victim has short attacks in which his knees buckle and objects drop from his hands. The attacks are usually brought on by some emotional crisis.

One patient could hunt only with a dog, since if a bird flew out of the brush without warning, the patient would be startled and fall helplessly to the ground. Others have had to give up fishing since a sudden strike would make them drop their poles, the physicians report.

Sleep paralysis is another symptom of narcolepsy and usually attacks the victim when he goes to sleep or awakens. The person is suddenly aware that he cannot move or cry out, yet he feels awake. One man had an attack while smoking in bed, and, although aware of the cigarette smoldering between his fingers, he could not move even when burned.

Correct diagnosis of the disorder depends mainly on the past history of the patient since laboratory examinations many times show nothing. Once recognized, however, treatment with drug stimulants can be highly effective, the authors conclude.

Their report appears in the *Proceedings of the Staff Meetings of the Mayo Clinic* (June 12).

Science News Letter, July 27, 1957

# IN SCIEN

## MEDICINE

## Brown Spider's Bite Needs Medical Attention

➤ THE "BLACK WIDOW" is not the only U. S. spider with a bite poisonous enough to require medical treatment, Drs. Curtis W. Wingo and William A. Sodeman and the late Dr. James A. Atkins, University of Missouri, Columbia, report in *Science* (July 12).

They have implicated a brown spider, similar to the one which causes the "gangrenous spot" on the skin of South Americans. The bite of the spider causes the affected area to first turn violet, then black and dry. Within a few days or a week the dead tissue sloughs off leaving a deep opening which may not heal for several weeks.

A rash resembling scarlet fever broke out all over the victim's body in a few of the cases reported in Missouri.

The spider responsible is believed to belong to the *Loxosceles* group, which includes the one responsible for the South American bites. Laboratory tests are now underway with the spiders to test their effect on animals, and early results show that they excrete a powerful venom capable of destroying tissue cells.

This particular spider, the *Loxosceles reclusus*, is probably causing the same condition in the Midwest, southern and southwestern United States that its relatives have caused in South America, the authors report.

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## INVENTION

## Recipe for Topsoil Wins U. S. Patent

➤ A RECIPE for making your own synthetic topsoil has received a patent.

Here is the recipe: Pulverize some igneous rock such as granite; pulverize some sedimentary rock, such as limestone; pulverize some gypsum and powder some clay. Mix two parts of the granite with two parts of the limestone, one part of the gypsum and two parts of the clay. Then mix with approximately two and one half times its weight of organic material consisting of eight parts of peat, four parts of horse manure and seven parts of sewage sludge. Place the mixture in a digester tank and ferment. To speed fermentation, a catalyzer such as potato yeast culture and hippuric acid can be added. Mix well for a few days with a worm-screw.

The synthetic topsoil is the invention of John D. Larson of Hinsdale, Ill., who won patent No. 2,797,985. He says that the soil artificially reproduced has all the essential properties, chemical, physical, biological, bacteriological and mechanical for sustaining plant life.

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# CE FIELDS

## MEDICINE

### Cortisone-Like Drugs Stop Childhood Killer

► CORTISONE-LIKE drugs are now turning the tide of battle against nephrosis, the childhood killer that used to claim 50% of its victims.

A three-year study of the drugs on 30 children at the Children's Hospital of Philadelphia has shown that the adrenal steroids can cut down the death rate to 20%, Dr. Wallace W. McCrory of the hospital told SCIENCE SERVICE.

Associated with him in the research has been Dr. Milton Rapoport, also a pediatrician and kidney specialist at the hospital.

"This is the first time we have been willing to state the outlook for this disease with the present therapy," Dr. McCrory said.

Nephrosis is an acquired degenerative disease of the kidneys which occurs mostly in children. The cause is still unknown and until the steroids came into use in the early 1950's there has been little that could be done for the victims.

Now, with hormone treatment, improvement can sometimes be noticed within two weeks, although then it is still too early to tell what the future course of the disease will be, Dr. McCrory explained.

The most obvious symptom of nephrosis is tremendous swelling all over the body that takes place because of an inability to eliminate excess water.

The steroid treatment is potentially dangerous and must be carefully watched. It is usually given along with diet therapy and antibiotics.

In some cases it is necessary to keep up the steroids for a year or so to insure actual improvements, and there are cases which do not improve even with the steroids.

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## BIOLOGY

### Inbred Chickens May Double Egg Production

► A CLUE to the development of chickens that might lay twice as many eggs as today's hens has been discovered by two American poultry researchers.

Working with a strain of Rhode Island Reds, Walter Morgan and Dr. William Kohlmeyer of South Dakota State College, Brookings, S. D., have found that a surprisingly high number of them have a partially developed right oviduct not found in the average hen.

Normally, as the baby hen develops in its egg, it has the potentialities for developing both the left and right ovaries and oviducts.

But nature somehow stops further growth of the organs on the right side, and almost all hens are born with only one functioning side. As a result, their egg production is

probably only half of what it could be, the scientists report.

But the Rhode Island Red strain, which has been inbred for 11 years, has frequently yielded at least a partially developed oviduct on the right.

Although this has been found before in isolated cases it now appears that the persistent right oviduct may be a hereditary factor.

No unrelated stock has been introduced to the group during the 11 years and no selection has been made for two-sided oviducts.

Whether the chickens could be further inbred to more fully develop on the right side, and thus possibly double egg production, still needs to be determined.

The scientists report their findings in *Nature* (July 13).

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## PSYCHIATRY

### General Hospitals Treat More Mental Patients

► MENTAL PATIENTS are being treated in increasing numbers in general hospitals, Dr. Charles K. Bush of the American Psychiatric Association reports.

In the United States in 1954, 584 general hospitals reported 25,011 beds in psychiatric units with a total of 264,837 admissions. These are the hospitals that admit mental patients in other than emergency situations.

About two-thirds of these psychiatric units became active in the last ten years, Dr. Bush estimates.

Before 1800 there were only two general hospitals in the United States which accepted psychiatric patients. The Philadelphia General Hospital began this service in 1732, and the Society of the New York Hospital followed in 1779.

In 1900, there was a total of 19 general hospitals with psychiatric units. In the years from 1900 to 1920, which includes World War I, 13 additional units were opened bringing the total to 32.

From 1920 to 1940, or roughly the period between World War I and World War II, 98 units were opened, including 11 in Veterans Administration Hospitals and one in a Federal Government Public Health Service hospital.

From 1941 to 1945, the period of World War II, 46 units were added, including 18 in general hospitals of the Armed Services.

At the end of World War II, therefore, there was a total of 176 psychiatric units in general hospitals, or 32% of the number in 1956. Of the 584 hospitals now admitting mental patients, 223 say they put them in regular medical or surgical wards.

Many hospitals remarked that they could use many more beds for psychiatric cases, but a few reported that their psychiatric units were not paying their way because there were not enough patients.

The average length of stay was reported to be from 20 to 30 days. Per diem cost ranged up to \$45, with the majority reporting between \$15 and \$22.

Dr. Bush's study is reported in the *American Journal of Psychiatry* (June).

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## INDUSTRY

### Radioisotopes Help Weigh Red-Hot Slag

► THREE BRITISH scientists have succeeded in weighing accurately 30 tons of red-hot molten slag from an open-hearth steel furnace by a process using a radioactive isotope to measure the slag-mass indirectly.

G. R. Church, W. C. Heselwood and G. A. Nicholson of United Steel Companies, Ltd., of Great Britain, required an isotope with very specific chemical and nuclear properties. The isotope they needed would have to mix completely with the molten slag in an 80-ton to 350-ton capacity open-hearth furnace, emit measurable amounts of radiation, offer no health problems and be easily obtainable free from other radioactive impurities.

The isotope they found was barium-140 and one of its natural decay products, lanthanum-140, both giving off electrons and gamma rays, and both chemically similar to the slag components, the scientists report in *Nature* (June 22).

Mixed in with the slag-mass, composed of oxides and silicates of calcium and magnesium, the known quantity of radioisotope spread out through the melt. When a small sample of slag was drawn off, the total mass could be computed simply by the measurable dilution of the radioisotope by the slag.

To check their process, the scientists had a special run of approximately 30 tons of slag cooled, crushed and weighed by machine methods. The results showed that the isotope process had a remarkable accuracy of plus or minus one percent. Previous slag-mass estimations had been carried out by chemically analyzing samples to obtain the ratio of calcium oxide to magnesium oxide, from which total mass could be computed.

The isotope process is so safe, the scientists observe, that "it would be necessary to eat several pounds of slag" to get dangerously radioactive.

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## ZOOLOGY

### World's Rarest Youngsters Doing Well

► THE WORLD'S rarest youngsters, whooping cranes Nos. One and Two, are now two months old, stand approximately 30 inches high, almost adult-sized, and are in good health, George Douglass, superintendent of Audubon Park New Orleans, La., reports.

Regular telephone calls are made by the Audubon Park Commission to Washington to keep Government officials informed on the chicks' health, growth and general well-being.

Nos. One and Two, who are thought to be whooping crane Nos. 29 and 30 in the world's whooping crane census, are as yet unnamed. They are the celebrated offspring of Jo, for Josephine, and Crip, the only whooping cranes in the world held in captivity.

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