# SCIENCE NEWS

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## LANDSLIDES IN THE RHONE VALLEY

THE whole valley of the Rhone River is subject to the danger of landslides similar to the one which engulfed part of the residential district of Lyon, France, Professor R. S. Bassler, head curator of geology at the U. S. National Museum, said in answer to an inquiry from Science Service. This is the second serious landslide which has occurred in this section of the French city recently. Both were caused by the geological formations in that locality.

Landslides are a constant danger where the ground is made up of loose rocks saturated with water and mixed with clay, which as any one knows can serve as a perfect natural skid as soon as it is well wet. The Rhone Valley is filled with deposits of this sort left by Ice Age glaciers and built up by the river in more recent times. Great terraces of clay built up all along the course of the river are a constant potential source of slides.

The Hill of Fourviere, where a serious landslide wrought havoc just eighteen months ago and near which the recent slide occurred, is a spur of granite on which such a moraine of rock and dirt was deposited by an ancient glacier. It is not now on the Rhone, but on the Saone River just above the point where it joins the Rhone. In early post-glacial times, however, both these streams were probably one huge torrent.

Just to the north of Lyon, the Saone was wide and spacious and formed the bed of an old lake. Later, a glacier, coming down from the Alps to the east, obstructed the drainage of this lake, leaving great piles of sand, gravel and clay in the vicinity of Lyon. Then the lake dried up forming marshes.

The area north of Lyon, known as the "Dombes," contained in the Middle Ages a large number of small lakes and ponds. This is a celebrated area which was cultivated by the monks. In recent times these have been drained, but the soil is still moist and forms a great fertile section.

Officials of the U. S. Geological Survey do not recall any landslide in the United States which has done material damage to a large city. One of the most destructive slides in this country in recent years was in 1925 at Gros Ventre, Wyoming, east of Jackson Hole. There a great avalanche of earth, rock and clay, topped by an entire pine forest, swept down from an altitude of 2,000 feet, went all the way across the valley and piled up 350 feet high on the other side of the valley. Then it slid back and formed a dam 250 feet high all the way across the valley. This dam formed a new lake four miles in length. Two years later, during the flood season, the waters of the lake rose and overflowed the dam and swept away the village of Kelly, in Jackson Hole.

Dr. Edwin T. Hodge, geologist of the University of Oregon, has discovered in that state a landslide topography where, in prehistoric times, whole mountains have moved a considerable distance.

## THE NEARER ASTEROIDS

THE earth's closest neighbor in the sun's family, the Reinmuth object, discovered through Harvard computations, is one of the most important heavenly bodies discovered in recent years. Not since the discovery of the ninth planet, Pluto, have astronomers been so interested.

The Reinmuth object will come six million miles closer to the earth than the famous asteroid, Eros, discovered in 1898, which until a few weeks ago was known as the object that approached the earth closer than any other member of the solar system except the moon.

By a coincidence, it was found just a few days ago that the Delporte object, discovered the middle of March in Belgium, comes closer to earth than Eros, but the Reinmuth object's distance of eight million miles now breaks the Delporte object's record of ten million miles.

The asteroids are minor planets, most of which rotate about the sun in the wide gap of the solar system between Mars and Jupiter. More than a thousand asteroids have been discovered in that region and one theory is that they represent the remnants of a single planet that was spoiled in the making.

No asteroid has crossed within the orbit of the earth. If the Reinmuth object proves to be an asteroid and not a comet, it will be unique since the computations show that it will come within not only the earth's orbit but that of Venus as well.

This Reinmuth object, discovered by Dr. Karl Reinmuth on April 27, should not be confused with the "Reinmuth object" discovered by the same German astronomer last year and found to be a new member of the famous Trojan group of asteroids.

There is no hope that the interesting Reinmuth object, although comparatively close to the earth, will be seen with the unaided eyes. It is only about three miles in diameter and it is twelfth magnitude. Telescopes larger than six inches are necessary.

## X-RAYS OF THE LIVER

PIONEER work in the use of a new method of diagnosing diseases of the liver and spleen was reported to the final session of the American Medical Association at New Orleans. The new method detected conditions which could not be determined by any other laboratory or clinical methods now in use, Dr. Wallace M. Yater, professor of medicine at Georgetown University School of Medicine, said in discussing the results of a study made by himself and his associate, Dr. Laurence S. Otell.

In using the new test, a small amount of a solution called thorium dioxide sol is injected into the veins every day for three days. On the fourth day x-ray pictures are taken of the liver and spleen. Ordinarily these important organs do not show up well on the x-ray plate, but after the thorium dioxide injections the shape of both spleen and liver may be clearly seen. In this way physicians will be able to tell whether these organs are enlarged, whether there is fluid in the abdomen, whether

such diseases as cancer, cirrhosis or syphilis of the liver are present, and whether a large mass in the left side of the abdomen is an enlargement of the spleen or a tumor of some other organ.

The substance which makes all this possible is a compound of thorium, a heavy metallic element related to radium. Thorium dioxide, however, has no radioactivity and is a perfectly safe compound to use. It was first investigated for this purpose by a German, Dr. Radt, of Berlin, in 1928. Two other foreign scientists have investigated it, but the Georgetown group are the first to try it in this country.

Being a foreign substance, the thorium dioxide is taken up by certain blood cells whose duty it is to fight infections and gather up foreign matter in the body. These cells are very much concentrated in the liver and spleen. When they are full of heavy, opaque thorium dioxide, they, and the whole organ, show up in the x-ray pictures, Dr. Yater explained. Because these cells are also present in great numbers in bone marrow the new method may be used for diagnosing disease of this substance and of intracranial disease.

Most valuable of the older tests for determining how the liver is functioning is the icteric index, which indicates the presence of jaundice by showing the amount of red bile pigment in the blood, Drs. William Egbert Robertson, William A. Swalm and Frank W. Konzelmann, of Philadelphia, stated at the same session.

## UNITS OF HEREDITY

GENES, the ultimate units in heredity, have been seen and photographed, according to Dr. John Belling, biologist on the staff of the Carnegie Institution of Washington. This information has been made public by the institution at its headquarters in Washington.

Genes have hitherto been dealt with as hypothetical entities by biologists, because no one has ever actually seen them. They were like the atoms and electrons that make up matter: physicists treat them as actually existing things, though it is impossible to give them visual demonstration. But now Dr. Belling believes that he has brought the genes out of their invisibility.

All living cells contain structures that presumably contain genes—the chromosomes within the nucleus. But to get clear-cut pictures of chromosomes not all cells will do equally well. In the cells of some organisms chromosomes are too numerous or too small to work with conveniently; in others their outlines are not clear-cut.

Dr. Belling found lilies suitable for his purpose. By exceedingly fine and skilful microscopic technique, he got the contents of the pollen "mother-cells," each only one four-hundredth of an inch in diameter, emptied out on glass slides. By suitable chemical treatment he made the small divisions of the chromosomes, known as chromomeres, sharply visible. By further manipulation he was able to detect, within each chromomere, an exceedingly minute object which he takes to be the gene itself. A typical cell of the type Dr. Belling has been working with contains about 4,400 genes, arranged in 2,200 pairs.

In commenting upon the function of these structures, Dr. Belling says:

"A minute cell sphere with its 2,200 gene pairs suggests the celestial sphere visible to the unaided eye and containing fewer than 3,000 stars which can be seen at one time. These stars were supposed by some to exert a mystic influence on human beings. In the spherical cells of the organism, however, the genes actually do exert specific influences on the life of the organism in question, whether of the lily or of man. In fact these influences are so great that if the effects of all the thousands of genes in a given organism were added together nearly the whole of its inheritance would be accounted for.

"These strings of chromomeres are of more consequence, therefore, than the threads of life which, according to the old fable, the Fates were supposed to spin. Indeed, in many of the old sayings relating to the influences of the stars, if the term gene or chromomere be substituted for star the saying would hold to-day. Could we but identify every one of the chromomeres in a man (probably there are many more than in a lily), a reliable horoscope for him could be drawn up."

## GRASSHOPPER OUTBREAK IN THE WEST

ON top of low prices, crop failures and general financial setbacks, another and more relentless foe is coming to plague the farmers this summer—grasshoppers.

Field surveys just made by representatives of the U. S. Bureau of Entomology confirm earlier predictions that with favorable weather, the country is soon to experience the worst grasshopper outbreak of the last half century.

Already throughout the West, young 'hoppers are about to waken from their winter's sleep and begin ravaging the farmer's crops. Reports from Texas and Oklahoma say that the insects have emerged from their membranous sleeping bags and started inroads on pastures, alfalfa and small grains.

As the focus of last summer's operations, south central South Dakota and north central Nebraska are expected to be most severely pillaged by the grasshopper. This year, in addition, the section comprising northeast North Dakota and northwest Minnesota is regarded as an equally important battleground. Iowa, Montana, Wyoming and Colorado form the secondary zone of conflict, while locally in almost every other western state insect forces will be encountered.

Grasshopper troops will begin general mobilization any day now, according to Dr. W. H. Larrimer, federal entomologist. A few days of warm weather is all that is necessary to bring them out in battle array. There will be far more grasshoppers this summer than last and the total area infested will be much larger than before.

The ill forboded in this statement is quite evident. Last summer in Nebraska and South Dakota alone, more than three fourths of the crops on 4,800,000 acres spread over 17,000 square miles of territory were completely destroyed, resulting in untold financial losses.

While the seriousness of a grasshopper plague is fully realized in the West, Dr. Larrimer said, several states are unable to meet the situation with their own resources.

Distributing poison-bran mash is the best known means of combatting the insects, but funds to procure the mash and spread it on the fields are lacking.

Battle plans of the U. S. Bureau of Entomology have been formulated, but can not be pursued until the Congress acts on a bill now before it. This bill, backed by President Hoover, provides a government appropriation of $1,450,000 to buy the defensive poisons and make them available to the farmer this summer. The farmers themselves will then furnish an equivalent amount of labor for the spreading of the bran mash on the fields. The cost of protecting the crops against the devastating 'hopper is estimated to be about twenty to twenty-four cents per acre.

The wealth of the West can be preserved only this cheaply, Dr. Larrimer said, if Congress acts favorably on the bill within the next week or ten days. After that the grasshoppers will most probably be hatched and at work in the fields. The situation then will be beyond human control.

The peak of the damage done by grasshoppers will not be reached until July when the insects have wings and migrate in great swarms, but it is in May that protective measures are effective. The task of fighting the grasshoppers, Dr. Larrimer said, would be considerably lightened if nature were to inaugurate a spell of cold, wet weather for about two weeks after the bulk of the insects hatch. In that event, numbers of the 'hoppers would be destroyed.

## ITEMS

THE amount of ultra-violet radiation needed to cure or prevent rickets is surprisingly small, Dr. Arthur Knudson, of Union University, Albany Medical College, found in studies with rats which he has reported to the Society for Experimental Biology and Medicine. Assuming that a similar relationship holds for human beings as for the animals he studied, Dr. Knudson says it appears that much smaller amounts of ultra-violet radiation than are generally considered necessary will be effective. The amount needed to cure rickets is directly proportional to the area of skin exposed. Thus exposure of one fourth of a square inch of skin for twenty minutes daily healed rickets completely in three weeks in the rats. The same result was obtained by exposing one square inch for five minutes, two square inches for two and one half minutes or one eighth square inch for forty minutes daily.

BIOCHEMISTS are producing hormones that are too pure, Dr. Joseph C. Aub, of Boston, suggested before the meeting in New Orleans of the Association for the Study of Internal Secretions. These highly purified extracts do not produce the practical results on patients that earlier, impure extracts did, he pointed out. He suggested that in the process of getting pure crystals of a hormone, the chemist may have broken down the natural compound and gotten a "degradation product" lacking some essential of the original one produced by the gland in the body. He also warned the physicians against laying too much stress on glandular treatment alone and said there was no excuse for treatment with several glandular products at once.

ADVANCES in knowledge of epilepsy and a new theory as to its nature were reported by Dr. S. Bernard Wortis, of Columbia University and Bellevue Hospital, New York City, at the meeting of the American Medical Association. Dr. Wortis was able to cause epilepsy-like convulsions in cats by injecting a bromine-containing solution of camphor. Studying these cats, he concluded that very large doses of bromides would be necessary to secure good results in treating the disease, and that ether or chloroform would be useful in extreme emergencies. Operations to remove the adrenal glands or on certain nerves would not be a rational form of treatment for epilepsy, but removal of scars on the brain tissue resulting from injuries should be successful. Treatment by limiting the water intake or by feeding a high-fat diet will be investigated next.

MEASUREMENTS with the motion-picture camera of the time it takes the pupils of normal eyes to contract and to dilate were reported by Dr. Harry S. Gradle, of Chicago, at the meeting of the American Medical Association. He found that when light is flashed on a normal eye accommodated for the dark, there is a latent period of about one tenth of a second before the pupil starts to contract. Then, in a little over four tenths of a second, the pupil jumps to its maximum contraction. When the light is removed, the pupil starts to dilate at a uniform rate. In making his studies, Dr. Gradle was obliged to use young, blue-eyed, blonde persons, because the dark irises of brunets did not photograph clearly enough.

PHYSICIANS will be better able to diagnose certain diseases of the eye and to discover hardening of the arteries with the aid of a new instrument which was demonstrated by Dr. Jonas Friedenwald, of Baltimore, at the meeting of the American Medical Association. By applying certain principles used in modern microscopes to give sharper images, Dr. Friedenwald was able to develop this improvement on the instrument which is called the ophthalmoscope and which was originally invented by Helmholtz seventy-five years ago. This instrument enables physicians to see the back of the eye, and with the new improved model they can now see much earlier stages of disease and much earlier changes in the blood vessels. The difference between the new instrument and the old is much like the difference between using the high-power and the low-power lenses of a microscope.

BETWEEN three and four out of every hundred individuals, whether men, mice or rats, are "sensitive" to sulfhydril, the chemical group consisting of one atom of sulphur and one of hydrogen, which has been called the key-compound to life itself, Dr. Stanley P. Reimann, of the Lankenau Hospital Research Institute, reported to the recent meeting of the American Association of Pathologists and Bacteriologists. The discovery that certain individuals are "sensitive" to sulfhydril may throw light on many problems of cell division.