

THE SCIENCE NEWS-LETTER

A Weekly Summary of Current Science

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SUBMARINE SLIP CAUSED JAPAN EARTHQUAKE

The devastating earthquake in Japan undoubtedly originated in part in the sea off the coast of that island empire, in the opinion of Prof. Andrew C. Lawson, of the University of California, who has just come to Washington to head the National Research Council's division on geology and geography.

A great break in the ocean bottom occurred allowing one side to slip past the other and drop for probably a dozen feet, carrying with it many millions of tons of sea water. The ocean rushing into the vacated space set up the so-called tidal waves that, oscillating back and forth like water in a tub, swept the Japanese coast, Dr. Lawson explained. The violent shaking of the earth that caused destruction and started the fires was a result of the slipping of two portions of the earth's crust past each other.

The extremely deep portions of the oceans seem to be associated with the areas where earthquakes are most frequent, Prof. Lawson pointed out. Just off the east coast of Japan is a long depression in the ocean's floor called the "Tuscarora deep". Similar depths of the sea, found off Chile, the Phillipines, Jamaica and the Aleutian Islands in Alaska are regions where earthquakes are frequent.

Earthquakes occur when strains in the earth's crust become too great and find relief in slips and breaks, Prof. Lawson said. He likened the crust to a board that when stressed by a weight will finally give way with a sudden crash. The rocks of the earth are elastic like steel and will stand a certain amount of strain before they are relieved by sudden movement.

Japan is noted for the progressive piling up of strains that result in earthquakes. Prof. Lawson recalled the quake of 1891 in Japan that left an abrupt cliff as high as eighteen feet in some parts of the zone.

Scientists know that there are various regions of the world, like Japan, the coast of California, the Alaskan coast, Chile and New Zealand, where the earth's surface is unstable and where adjustments are now in progress.

Eventually it may be possible for scientists to predict earthquakes, Prof. Lawson believes. Extensive investigations are now under way by the U. S. Coast and Geodetic Survey in California that show that there is a crustal creep there of about three feet in ten years relative to the Sierra Nevadas. Several years

ago the National Research Council pointed out the need of seismologic study and the Carnegie Institution with the cooperation of other scientific bodies is making an intensive study of California, which was selected because of the work previously done on the San Francisco earthquake of 1906. The U. S. Coast and Geodetic Survey has had survey parties in the field for the last two years to determine the rate of movement there. Prof. Lawson considers this slow displacement as a strain creep, which accumulates till relief is effected by a sudden slip or a rupture in the earth's crust.

"After years more of such research", said Prof. Lawson, "I believe that it may be possible to predict about when the strains that are indicated by these movements will be released and cause an earthquake, but exact prediction is not likely to be obtained. We cannot draw conclusions from our present data because we do not know how earthquakes, often very slight in one part of the area, affect the strains in another part."

The deep-seated reason for earthquakes remains a mystery to science. The most plausible theory, according to Prof. Lawson, is that deep in the earth the rocks, while remaining hard and very dense, act like a fluid and tend to flow from one part of the earth to another, carrying the upper crust with them. The strains that produce earthquakes at the surface are caused by these deeper movements.

JAPAN QUAKE PREDICTED TWO YEARS AGO

The recent devastating Japanese earthquake was predicted nearly two years ago, F. Tondorf, S.J., director of the Georgetown University Seismic Observatory, declared. He pointed out that Prof. F. Omori, head of the Imperial Earthquake Investigation Committee of Japan in March 1922 forecast the occurrence of severe shocks within six years.

This prediction was based on the number of quakes in the years immediately preceding. The Japanese scientist noted that when earthquakes were many and often severe shocks were unlikely to follow, but when the small earth movements were relatively few and far between over a long period, earthquakes were liable to be more serious later. On account of the comparative absence of quakes preceding his forecast, Prof. Omori predicted that serious quakes would occur within a period of six years.

Through his study of rainfall in the northern part of the islands, he was able to point out an apparent connection between the precipitation and earthquakes, showing that when the rainfall was exceedingly heavy in this section it would be followed by earthquakes.

Omori believed that the primary cause of the earthquake is the breaking of the earth's crust, but that the cause of this break is the additional pressure furnished by the added weight of air and water as shown in rainfall and barometric measurements.

Prof. Omori also predicted the great Chilean earthquake of August 17, 1906, using data worked out in regard to the earthquakes of his native islands. He held that the stress applied along one of the great earthquake belts, on finding relief by an earthquake movement, will not for a time affect that neighborhood; but when

next the stress finds relief, it will be at a distant point along the belt. Upon the basis of this law he made the prediction shortly after the California earthquake of April 18, 1906, that the next great earthquake in that belt would occur in South America south of the equator. Immediately after this prediction came the Chilean quake.

GIANT FOSSIL REPTILE BROUGHT TO CAPITAL

Diplodocus, the gigantic eighty-five foot long reptile which over eight million years ago waded through the swamps of what is now Utah, has just arrived in Washington. Dr. C. W. Gilmore, paleontologist of the U. S National Museum, has reached here with the twenty-five tons of sandstone and fossil remains of this monster which were chiseled from the cliffs near Vernal, Utah, and hauled 152 miles across the mountains to the railroad.

Five years will probably be required to free the fossilized bones from the stone in which they are imbedded and mount the huge skeleton in the position in which it probably stood when alive. When completed it will be made the central feature of one of the large halls of the Museum.

Some eight to twelve million years ago, this fossil creature was alive from the end of its slender tapering tail to the top of its head on its long neck and stood fourteen to sixteen feet high at the hips. It could stand in water forty feet deep with its feet on the bottom and thrust its head above the surface. It is estimated that alive and in its skin it weighed from sixteen to eighteen tons.

Since its time, rocks have been laid down burying the lagoons and swamps in which it lived some 10,000 feet below the most recent strata. The forcing up and folding of the layers of rock to form mountains brought these ancient rocks up to where the fossils were found, a locality set aside some years ago as Dinosaur National Monument and from which the Carnegie Museum of Pittsburgh has taken many specimens of the same species.

What was once low swamps has been raised during the ages to 4,000 feet above sea level. After cutting the fossils and their surrounding sandstone from the cliff, the twenty-five tons of material representing the remains of this swamp-living creature were carried 5,000 feet higher to get them across the mountains to the railroad 152 miles away.

One of the seventeen vertebrae of the neck of the diplodocus was three feet long, while one of the pelvic bones weighed, as boxed, nearly 2,000 pounds. For shipment the fossils were roughly hewn out of the stone, and much careful work will be required to remove the remaining rock from around the fossilized bones.

Preparations are being made to introduce two new insect parasites to help fight the European earwig which does great damage to certain grasses and flowers in Washington, Oregon, and Rhode Island.

FUTURE ECLIPSES

Total obscurations of the sun during the next five years will take place:

- Jan. 24, 1925, visible in New York City and eastern United States.
- Jan. 14, 1926, visible in eastern Africa, Sumatra, and Philippines.
- June 29, 1927, visible in England and Scandinavia.
- May 19, 1928, visible in Antarctic Ocean.

FAMOUS PAST ECLIPSES

- Oct. 22, 2136 B.C. First recorded eclipse observed in China.
- May 28, 585 B.C. First eclipse known to have been predicted, a mathematical feat performed by Thales of Miletus.
- Aug. 30, 1030. Red light of corona of eclipsed sun frightened soldiers in battle at Stiklastad, Norway.
- May 30, 1612. First eclipse seen "through a tube" or telescope.
- October 27, 1780. First American eclipse expedition from Harvard University.
- July 8, 1843. This eclipse marked the beginning of physical research on the sun.
- July 28, 1851. First photograph of eclipse made in Germany.
- Aug. 18, 1868. Janssen, French astronomer observing in India, determined from spectrum of solar prominences that they are enormous masses of highly heated gaseous matter. Observation revealed spectral line of helium, not discovered on earth until nearly thirty years later.
- December 22, 1870. French astronomer, besieged in Paris, escaped by Balloon carrying parts of telescope only to have observations spoiled by clouds. Prof. C. A. Young discovered "flash spectrum" and also line in corona spectrum attributed to hypothetical element "coronium".
- May 29, 1919. Photographs by two British expeditions showed bending of light rays from stars as predicted by Einstein.
- September 21, 1922. Lick Observatory party in Australia confirms Einstein effect.

ROOMS TO BE LIGHTED BY GLOW FROM WALLS

Cold light, a product of future science, will allow the illumination of rooms by means of a soft glow emanating from its walls, Prof. J. H. Mathews of the University of Wisconsin predicts in a communication to appear in the next issue of Industrial and Engineering Chemistry, a publication of the American Chemical Society.

"Our modern lighting methods, in which visual radiation is produced by heating bodies to incandescence are naturally very wasteful, since a large amount of energy is lost as temperature radiation," Prof. Mathews says. "The firefly and glowworm have solved the problem somewhat better, though we humans would scarcely be satisfied with either of these lighting systems. The firefly produces substances which by oxidation produce light with little or no temperature radiation. We must at least admire his efficiency."

"What the firefly can do, man should be able to do, and far better. Undoubtedly, the time will come when light will be produced by controlled chemical reaction, and in a more economical way than by the systems now in use. In one direction considerable improvement may be made, at least. Little expert knowledge is now used in the selection of paints and wall coverings in room interiors. Much of the light now absorbed and wasted may be saved and used by reflection, simply by a proper choice of wall covering. In addition, there is the possibility of using materials in paints and on paper or other surfaces, that will emit light for many hours after receiving illumination during the day. It is felt that, in spite of all the excellent work done on phosphorescent sulfides, considerable work must still be done before we have the knowledge we need. There is distinctly a great field for research along this line in the hope of developing more efficient phosphorescent materials than are now known."

RADIO, RADIO, WHERE IS THE RADIO

A new sort of radio game, modelled after finding a needle in a haystack, was on the amusement program of the convention of the American Radio Relay League to be held September 12 to 15. in Chicago.

A radio transmitting station was carefully hidden at some point in the city and parties of the visiting radio amateurs, armed with portable receiving sets attempted to locate it from the messages it sent. The parties of the searchers were equipped with loop antennae which can be made to show the direction from which the hidden radio signals are coming.

Radio amateurs predict that this game will soon become a fashionable out-of-doors sport at lawn fetes and fairs.

FIND BIRD'S NEST AFTER SIXTY YEARS SEARCH

After eluding all searchers for over sixty years, a nest and eggs of the wandering tattler, a sea bird rejoicing in the scientific name *Heteroscelus incanus*, have at last been found by O. J. Marie of the U. S. Biological Survey, Department of Agriculture, in the Savage River region of Alaska. The nest and four eggs have been sent to Washington where they were transferred to the U. S. National Museum for permanent preservation. Dr. C. W. Richmond, associate curator of birds in the Museum said today that the "Wandering Tattler was discovered in Polynesia on one of Cook's voyages, and has since been found on many islands of the Pacific, but always as non-breeding birds. For many years it

has been known to occur on our west coast and in Alaska, where it was thought to nest. Many expeditions there in the last sixty years or so have been on the lookout for the nestband eggs of this species, but without success until the present".

BAMBOO TREES TO CHANGE LANDSCAPES IN SOUTH

"Superbly beautiful groves of Japanese bamboo will some day change the landscapes of our Southern States and furnish a unique timber material suited to a host of purposes on the farms where it will be grown," officials of the Bureau of Plant Industry of the U. S. Department of Agriculture predict. At the Department's plant introduction garden in Savannah, there is a grove of this timber which now covers over an acre of land, has poles in it over 55 feet high, and is spreading rapidly. This bamboo thicket was developed from a few plants imported early in the eighties.

EINSTEIN PLAGIARISM CHARGE REFUTED

The accusation which has recently appeared in print that Einstein purloined his idea of the deflection of light from an astronomer of a century ago will be contradicted in the September 1 issue of "Science" by Dr. Robert Trumpler, of Lick Observatory.

In 1801 J. Soldner calculated the angle of the deflection of a ray of light passing the edge of the sun's disk, on the idea held by Newton that light consisted of a stream of minute material particles and so would be attracted by the sun's gravitation. The figure he got for the angle of deflection was 1.7 seconds of arc, which is what the astronomers found in the eclipses of 1919 and 1922. But Dr. Trumpler on referring to Soldner's original article in the Berlin Astronomical Yearbook finds that Soldner reached this result by means of a mistake in his figuring. If he had worked out the problem correctly on his own assumptions he would have got a deflection only half so great. Einstein in 1911 worked out the same problem, also on the basis of Newton's law of gravitation, and got the figure Soldner should have got, but did not, that is, .83 seconds.

But in 1916 when Einstein substituted his own theory of relativity for Newton's law of gravitation he found that this led logically to double this deflection, namely 1.7 seconds, which is what the British and American Astronomers found in the latest eclipses of the sun. So if Einstein had known of Soldner's paper, which is not likely, he would have been misled by it, or would have found that it contradicted rather than confirmed his own theory. In the eclipse of September 10, astronomers from various countries will have telescopes in Southern California or Mexico to test the validity of the Einstein theory by photographing the stars about the sun during the few minutes of darkness.

The damage done by insects and diseases to living trees and to forest products amounts to about \$130,000,000 a year, Department of Agriculture experts estimate.

NEW DEVICE DISSECTS MICROSCOPIC GERMS

Germs can now be dissected and handled under the microscope according to a report sent to the American Medical Association by its Budapest correspondent. Dr. Tibor Peterfi of that city has demonstrated to a medical society a device with which an investigator can grasp bacilli and cut them with glass and platinum needles. This is expected to result in new physical and chemical investigations.

BLOOD PRESSURE INCREASES AFTER SMOKING

After smoking a cigar or three cigarettes, blood pressure rises and the heart beats faster. This is the finding of Dr. Robert L. Bates, psychologist at Johns Hopkins University, who carried on experiments so that physicians could have real evidence on the dangers of smoking during sickness.

The rise in blood pressure and heart rate is only as much as might occur normally due to other conditions and both return to normal in from twenty to thirty minutes. Dr. Bates was unable to determine how much of the change was due to the products of smoking tobacco and how much to mental effects, for it is known that emotions and mental processes may also affect pressure and heart rate.

CHEMIST CALMLY EATS MYSTERIOUS BLOODY BREAD

A bread baker who was assailed by a customer "for trying to poison her" ran with a loaf of red stained bread to the laboratory of the American Institute of baking in Chicago.

"What could the scientists say about this red stain?" he asked. "Was it poison? Was it dangerous? Why should a customer say it was poison? Was it his fault the red stain grew upon the bread?"

Harold Turley, one of the Institute chemists, answered him by breaking off a patch of the red stain and eating it.

Then he explained that here was one of the important conquests of science over superstition. Once when people found this curious red stain on the family bread, or on the boiled potatoes they cried out that it was "wunderblut" or miracle blood. When the wafers used for sacramental purposes developed this red stain, devout religionists of the Middle Ages were sure they were in the presence of a great miracle. Religious processions were formed to celebrate its appearance.

The fame of "wunderblut" became worldwide and when it was the fashion to burn witches some were burned on the grounds that they had bewitched the bread so that it gave forth the wanderblut. Even New England joined in the persecution of "witches" on this charge.

"Until Louis Pasteur and his associates worked out the bacterial theory of disease," Mr. Turley said today, "outbreaks of red stains on bread always over-

awed the populace. At Padua they had an outbreak that lasted a whole week and many thought that indeed here was blood from heaven, raining down upon the people's bread. Much praying was done. Then came Ehrenberg, the famous bacteriologist. He found that each little red spot was a colony of bacteria that instead of being green or black, like molds, was red colored. The bacteria were isolated and named bacilli prodigiosus. They were found to be as harmless as mold on cheese, so I did not hesitate a moment to eat the once mysterious plants. Since science took the wonder out of wunderblut, they have controlled it so that outbreaks are now very rare."

"DEVIL'S GRIP" INFECTIOUS BUT GERM STILL UNKNOWN

"Devil's Grip" is an infection but the elusive germ that does the work is still at large. This sums up the status of the inquiry into the cause of this strange disease now prevalent in Virginia as reported by Dr. George C. Payne, epidemiologist of the Virginia State Board of Health, and Charles Armstrong, Passed Assistant Surgeon in the United States Public Health Service.

The epidemic appears to be confined to rural communities and to be spread within families by contact, they find. Children are more frequently attacked than adults. The symptoms point to an inflammation of the surface of the diaphragm and the disease might be called, technically, epidemic transient diaphragmatic spasm, and is quite possibly related to some of the other infectious conditions which follow the epidemics of influenza.

The condition was first reported by Dr. Maud M. Kelly of the State Board of Health of Virginia last month. She had seen a number of persons in Hanover County who had recently suffered from an illness characterized by an acute onset, with abdominal pain but without the usual history of summer digestive disturbances. On July 21 similar cases were reported in Carolina County and since that time they have appeared throughout the northeastern part of the state. Cases have been reported by thirty-eight physicians from twenty-two counties. A similar disease appeared in Virginia in 1888 and was described by Dr. W. P. Dabney under the name "Devil's Grip". His paper was called, "An account of an epidemic resembling dengue which occurred in and around Charlottesville and the University of Virginia in June, 1888." The attack comes on suddenly with severe abdominal pain which later extends to one or both sides of the lower part of the chest cavity. Breathing is difficult and rapid. The temperature rises in practically all cases and there is intermittent pain. Most of the patients perspire freely. The pain is increased on movement and in some cases by swallowing. In general, the patients are constipated but the condition is followed by diarrhea. Most of the patients complain of headache and pain in the back. After from four to ten hours of severe pain and difficult breathing, the condition begins to subside but there may be relapses. Most of the patients recover without any secondary complications.

On days with good winds, a windmill may develop as much power as 100 pounds of coal.

EINSTEIN NOW FAMOUS AS BIOCHEMIST

Albert Einstein, famous for his theory of relativity and his other mathematical and physical researches, has invaded the field of chemistry. He has just announced a new method of testing the size of pores in filters used to separate bacteria from liquids. He uses the chemical liquid, ether, in this test, not the all-space-filling sort that his relativity theory considers unnecessary. The filter is saturated with ether or liquid carbon dioxide which are then removed by compressed air. The size of pores in the filter can be calculated from the air pressure necessary.

FIND EARLY HUMAN BONES IN EGYPT

Fossilized human bones discovered in Egypt by Dr. D. E. Derry and reported to the Royal Anthropological Institute in London are believed by scientists to be new evidence for the evolution of the human race.

This is the first time that fossilized human bones have been obtained from Egypt and due to their condition and surroundings, Dr. Derry believes them to be of Pleistocene or Glacial age, the period of time that preceded the present.

These evidences of early man were found early this year by the British School of Archeology in Upper Egypt, at Gau-el-Kebir, on the east bank of the Nile. They were mixed with a great heap of animal bones, contained in an Early Dynastic grave, evidently dumped there by later peoples as a supply of material for bone carvers. The pieces of human skeletons are found associated with those of two extinct animals, a crocodile and a buffalo, both of which roamed in the Glacial Age. Clinging to the bones were fresh water oyster shells indicating that they once lay in a swamp of the Nile. The skulls in the collection are remarkable for their small brain capacity.

PARTRIDGES DRUM BY BEATING THE AIR

The mystery of the "muffled-drum" of the ruffled grouse or partridge has been cleared up by the observations of an ornithologist. Edmund J. Sawyer, in a bulletin of the Roosevelt Wild Life Forest Experiment Station, Syracuse, N.Y., gives the details of his watchful waiting in a forest blind which revealed that the drumming sound of this great game bird is produced by merely the striking of the air with its wings.

Various explanations of the manner in which this drumming is produced have been previously advanced. It has been thought by some that the bird beat its sides with its wings; others have thought that the breast formed the drum. Still others have claimed that the wings struck together above the back. Inflated air sacs on the neck of the grouse have also been claimed as the source of the sound, while others have advanced the theory that there was some peculiar development of the body plumage to account for the loud noise.

Mr. Sawyer, however, says that the outward and upward motion of the wings is chiefly responsible for the sound, that the striking of the air with the wings is

practically the sole cause of the sound.

The grouse, he notes, generally picks out a hollow log for his concert platform and frequently turns round and round on it like a dog before beginning to drum, but almost invariably faces in the same direction when drumming on any given log. He believes that the drumming closely corresponds to the singing of other birds.

RHUS DERMATITIS (Poison Ivy). Its Pathology and Chemotherapy. By James B. McNair, The University of Chicago Press. \$4.

Nearly everyone who "gets back to Nature", runs the chance of an unpleasant contact with poison oak or ivy. This shrub-vine caused skin eruptions on Capt. John Smith that caused him to give it an "ill name" in 1609. The plant has not reformed with age. The lack of any rational treatment lead Dr. McNair to try to isolate the principal skin irritant of the plant in the hope that a knowledge of its characteristic properties might serve as a basis for a remedy. This is the frankly technical yet interesting book that reports his results.

Automobiles can not be driven with comfort over the bumpy surface of the stone slabs which form the famous thousand year old roads of the ancient Romans.

Errors of as much as twenty-five per cent are not uncommon in household measuring cups now on the market, investigation by the U.S. Bureau of Standards has revealed.

The Argentine Government publishes a weather forecast one week in advance based on observations made in Chili by the Smithsonian Institution of the United States.

Enormous swarms of caterpillars recently completely stripped over 2400 acres of forest trees in Saxony.

A daily clinic for the instruction of mothers in the care and feeding of young children will soon be opened in Mexico City.
