SCIENCE NEWS

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THE CAUSE OF EARTHQUAKES

A SLOW pulsation of the earth, causing it to get a little stouter, then a little thinner, may be the cause of a shift of the centers of earthquakes away from the equator during the twentieth century. This is the theory advanced by Professor T. Terada and Dr. S. Miyabe, of the Tokyo Imperial University, to explain a slow change in the latitude of earthquakes.

Successive earthquakes in Japan recently have shown a tendency to get farther and farther north, so the two investigators searched the records to see whether anything like this had occurred in the past. They found that during the sixteenth century earthquakes in Japan and Eurasia moved south, while those in South America moved northward, or, in other words, they all tended to approach the equator. About 1600 this tendency was reversed, and they receded from the equator. By 1700, the Eurasian earthquakes began to move southwards again, while those in South America began a new northward march shortly afterwards. About 1800 the reverse tendency again appeared. Approaching 1900, the Eurasian quakes again moved south and the South American ones north, but just about 1900 they again went into reverse. Quakes in North America also moved approximately the same way as others in the northern hemisphere.

Two astronomers, Dr. E. W. Brown, of Yale, and Dr. W. de Sitter, of Leyden, have studied the unexpected shifts of the moon from its predicted positions, which might affect the position of the earthquakes, so Dr. Terada and Dr. Miyabe compared these curves with those for the earthquakes. Though there is a rough agreement, they think it more likely that the earth itself pulsates over a long period. The earth is not a perfect sphere, but bulges a little at the equator. This bulge might increase and decrease. The greatest stress would be produced in the middle latitudes, and would manifest itself as earthquakes, and in some way the pulsations might cause a shift in the centers of the earthquakes.

Such studies as these, teaching scientists how and where earthquakes occur, may eventually help them to predict earthquakes, and so reduce their danger.

AUGUST METEORS

WITH the coming of August, thousands of amateur astronomers in all parts of the United States are now watching the night skies for meteors, or shooting stars. By making careful records of what they see, without the aid of telescopes or even opera glasses, they are gathering data that will enable scientists to learn more of the behavior of these celestial visitors, for meteor observation is one branch of astronomy that does not require an observatory. A pair of reasonably keen eyes, a willingness to sit up a good part of the night, and a clear, dark sky are the only essentials.

These reports are being received and studied by Professor Charles P. Olivier, director of the Flower Observatory of the University of Pennsylvania. He is one of the leading meteor authorities of the world and president of the American Meteor Society, which includes the most active of the amateur meteor observers.

Meteor gazing is a sport that requires late hours, for the earth turns in such a way that after midnight we meet the meteors coming towards us, while before midnight they have to catch up with us. The result is that from 1:00 to 4:00 A. M. are the best hours for the chase.

Even in the earlier hours during August, if a person gets away from the brilliant light of a large city and watches the sky, several meteors will probably be seen in the course of an hour. And after midnight, a dozen or more might reward the searcher.

But on two particular nights these numbers will be enormously increased. On the nights of August 10 and 11, or really the early mornings of August 11 and 12, several hundred meteors an hour may usually be seen. The astronomer, studying meteors, wants to know two facts about them. First of all, he wants to know their numbers, so it is a useful labor simply to count the meteors as they flash across the sky, and make half-hourly totals.

It is the paths that the shooting stars take in the sky, however, that form the astronomer's most valuable data. One way of plotting these is to have a map of the sky, and, with the aid of a small flashlight, to mark down the paths with a pencil. As the meteors all move through the stars in a straight line, it is only necessary to notice where the trail begins and ends, then to mark these points on the map and to connect them with the aid of a ruler. Each path should be numbered and the number, with the time that particular meteor occurred, should be listed on a separate sheet.

When the August meteors are charted in this way, it is found that they do not dash about the sky at random, like members of a swarm of bees. All the straight lines drawn on the map will be seen to radiate from a very small area, a place in the constellation of Perseus. This is a group of stars that rises above the northeastern horizon about midnight at this time of year.

The reason for this curious effect is that the meteors travel in a ringed cloud around the sun. The swarm is not sharply defined, but shades off rather gradually, so that while the meteors are especially thick in the center of the swarm, they are still numerous at some distance from the center. Every summer the earth crosses this swarm. Towards the end of July we encounter the outer ones, then they become more and more numerous until the nights of the tenth and eleventh of August, when we encounter the greatest numbers. The meteors are very tiny, some no larger than a grain of sand, most no larger than a pea. They are all moving in parallel paths. When they encounter the atmosphere of the earth, the friction heats them and burns them up, causing the flash that we see.

ALASKAN SURVEYS

NOT all of the unexplored places of the earth lie in far-away places under foreign flags, according to Stephen R. Capps, acting chief Alaskan geologist of the United States Geological Survey. In Alaska is a vast area of many thousands of square miles which is practically unexplored. One of the largest of these unexplored areas is the region that lies between the Skwentna River on the north and Lake Clark on the south, and between the west front of the Alaskan Range and Cook Inlet. This region, in the south central portion of the territory above the Alaska Peninsula, is entirely occupied by rugged, glaciated mountains except for a narrow strip of low, marshy land between Cook Inlet and the mountains.

A portion of this hitherto unknown territory has been invaded by geologists and topographic engineers of the Geological Survey under considerable difficulties, and as a result of their labors during one season an area of about 1,200 miles was mapped geologically and topographically on the scale of 1:180,000. Of this area 900 square miles, mostly in the headwaters of the Skwentna River, was country that previously was entirely unexplored.

In such new, unknown country, where streams are too swift for ordinary boating and the only trails are those made by the native animals, the map-maker and geologist must still use the primitive methods of transportation, including the pack horse and the boat dragged by hand through swift currents. In one locality visited by a survey party no human being was seen for a period of over two months and even the signs of native camps indicated that they were twenty to thirty years old.

In this country, so little visited by man, either white or native, the animal life is almost undisturbed. Over a hundred black and grizzly bears were seen during one summer by the surveyors. Caribou and moose are also plentiful and some mountain sheep range on the high rugged ridges.

Fish, however, are scarce in most of the streams, owing to the large amount of glacial silt in the waters.

AVIATION IN LATIN AMERICA

EMMA REH STEVENSON writes from Mexico City that in a few months commercial aviation has made remarkable strides in Mexico and other parts of Latin America. Small private lines that were plying trade in isolated spots are now linked and to-day a net of airways is enmeshing all America very rapidly.

One can fly from the Texas border to the oil fields at Tampico, Tuxpan, or to Mexico City. From Vera Cruz there are lines to the Isthmus of Tehuantepec or to Tapachula on the Guatemalan border, or to Yucatan *via* the almost unknown coast of Tabasco and Campeche, forgotten since the pirates were driven off the Spanish Main. A branch line from Merida will soon cross Yucatan and Quintana Roo to Cozumel, over territory inhabited by hostile Indians where no one has ever been welcome. The Guatemalan government has a line from Guatemala City to Flores, in the inaccessible Department of Peten, where the Maya Indians from Chichen Itza took refuge when their empire fell in northern Yucatan.

Mexican airlines from Tapachula in the south will soon be extended to Guatemala City, and mail will go from Texas to Guatemala in twelve hours. From there the Republic of Salvador and the Pacific side of Nicaragua will be linked with the Atlantic side by other units of the Pan-American system. To-day one flies from Florida to Santiago, Chile, if one likes, and by fall one will be able to continue the journey across the Andes to Buenos Aires, if aviation officials' plans come true.

Aviation in the United States, and aviation in the rest of America to the south, are of very different character. In the United States flying has merely supplemented or speeded up already existing excellent means of communication. In Mexico and other parts of Latin America good roads are even scarcer than railroads, and the airplane has jumped a broad gap in the development of transportation. Airplanes serve where often there has been no means of communication at all before.

Mexico, like other Latin-American countries, is a living museum demonstrating all stages in the history of transportation. The trimotor plane for Tampico flies overhead following the railroad past Teotihuacan, the ancient Toltec city of pyramids that is a landmark from the air. The tourist's automobile from Mexico City forces the Indian's burro off the village street in modern Teotihuacan.

The burro, loaded out of sight with sacks of charcoal burned in the mountains, is the Spaniard's most human gift to the Indian, and his only beast of burden. Before the burro came to him, as if out of heaven, the Indian carried everything himself, and in the course of thousands of burro-less years he had developed the art to a fine point.

THE CAUSE OF HICCUPS

HICCUPING, the occasional aftermath of eating and imbibing too freely and hence the provocation of much derisive mirth, may have serious aspects. Vera Stone, a young eighteen-year-old girl of Ripley, Tennessee, has now entered upon the seventh week of continuous hiccuping. She has lost close to twenty pounds since it began and suffers from headache and high fever. Several doctors have studied her case without being able to give her relief. Her personal physician is now treating her for brain inflammation. It is now generally believed that severe hiccuping is due to some abnormal stimulation of the respiratory center in the brain.

This severe form of hiccup presents one of the most baffling problems in medicine. It is frequently the symptom of some underlying trouble and often proves exceedingly difficult to check. The administration of carbon dioxide gas has been found to give relief in cases of this type though it has been tried out only on a limited number by Dr. Russell F. Sheldon, of Boston. The patient remains conscious while the gas is administered and the procedure can be stopped at any time at his request. It controls hiccuping temporarily and in some cases stops it altogether.

There have been hiccup epidemics, some of which occurred in Great Britain during the outbreak of influenza

at the end of the war, where this form of the disease was called "hiccuping flu." Such epidemics have also appeared in association with encephalitis, the sleepy sickness that has created so much alarm in the last dozen years in both this country and Europe.

Dr. E. C. Rosenow, of the Mayo Clinic, at Rochester, Minnesota, has been greatly interested in hiccup in this connection. He says that since the influenza epidemic of 1918 hiccup epidemics have usually occurred in association with encephalitis throughout most of the civilized world. Winnipeg had a particularly bad scourge of this kind in 1919 with mild recurrences in 1923 and 1924. Physicians gathered evidence here that hiccuping cases acquired a certain degree of immunity to the worse manifestations of encephalitis.

Dr. Rosenow has reported the isolation of a germ, a streptococcus, from patients suffering from the epidemic form of hiccup, which he believes is the cause. Animals inoculated with this streptococcus have been seized, according to his reports in scientific literature, with characteristic spasms of the diaphragm. He has been working on a serum to be used, if successfully developed, in treating the disease.

Occasionally cases die from hiccups, but these are rare and occur usually in combination with some other severe disease or malady. One was reported from Paris of a man afflicted with a pyloric tumor. One patient who died in the Mayo Clinic had severe cerebral and vertebral complications. Germs were isolated from this case which Dr. Rosenow identified as the same as those he had previously found in epidemic hiccup.

ITEMS

THE first educational talking movie to be produced for the general use of schools and colleges is now in preparation, according to the University Film Foundation, which is associated with Harvard University. The film, which will inaugurate a series of educational talking movies, will be entitled "The Corner Stone of the Nation" and will relate the history of Massachusetts from the founding to the present. Cameramen are now taking the pictures on the actual spots in which history was made, with actors, dressed in authentic costumes of the period, to play the historical characters. The talking part of the film will consist of a lecture on the scenes, delivered by Professor Albert Bushnell Hart, the Harvard historian. When the photography is complete, Professor Hart will deliver the lecture into a microphone as the film is shown before him. His words will be recorded on film, and then printed along the side of the pictures. When these films are shown in a sound movie projector, such as is used in the theaters, Professor Hart's lecture will be reproduced as the film is shown. In this way schools throughout the country may have both the pictures and the talk.

THE survey now being conducted by the United States Bureau of Mines and the United States Geological Survey has disclosed the fact that we have in the Permian basin a sufficient reserve of potash to make the nation independent in any future emergency such as that which arose in 1910 when German legislation voided all American potash contracts. It will be necessary to solve certain problems of transportation, marketing and mining engineering before the potash is available for commercial use, but these problems are now being attacked by federal, state and private agencies. The area in which the potash-bearing salts have been found occupies about 22 counties in Texas and New Mexico. Altogether it covers about 40,000 square miles.

IN order to accumulate suitable material for a study of accident prevention, the National Safety Council is urging the detailed classification of all accidents. Four states have agreed to cooperate, so far, and since the first of the year have been collecting, for each accidental death reported, the facts as to where the accident occurred, and the class or kind of accident. In this way accidents may be classed as domestic, industrial or occupational, or public, the latter being those which take place in a public place, such as the street. In the latter class further details are collected to determine whether vehicles were involved and whether pedestrian, passenger or driver was killed, how the accident happened and how many vehicles were involved. About 96,000 deaths from accidents occurred in the United States during 1928 and measures for prevention can not be effectively applied until the circumstances surrounding such accidents are known. The Safety Council will supply health departments with a form for accident reporting, which is being recommended both by the National Safety Council and the American Public Health Association.

DR. F. L. PICKETT, head of the botany department of the State College of Washington, has discovered ferns and mosses in the semi-arid regions of the northwest that will live indefinitely without moisture. While the ordinary plant will not grow without at least a four or five per cent. moisture content, these ferns and mosses may have their water content reduced to one tenth of one per cent. and live in this condition indefinitely. Some of these plants, known to have been kept between the leaves of a folder in a perfectly dry state for seven years, began to grow when water was applied. There is also a wild onion growing in this section of the country which conserves its water supply through the dry season by means of a corky layer on the outside of the bulb. Experiments conducted at the Boyce Thompson Institute for Plant Research showed that none of 50 different chemicals, used in the hope of increasing the life of cut flowers, was noticeably effective. Potassium permanganate did prevent decay of the stems of phlox and asters, but it did not make the floral parts last any longer. Other chemicals in some cases actually caused injury to the flowers. Low temperatures were a great help in keeping roses, carnations and coreopsis, but the cold did not greatly benefit either cosmos or dahlias. Humidity is also an important factor in keeping cut flowers. Carnations kept two or three times as long in an atmosphere which was nearly saturated with moisture.