SCIENCE NEWS

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RADIO RECEPTION AND NORTHERN LIGHTS

WHEN your radio crackles, squeals, moans or stubbornly remains silent despite your coaxing, does the earth's magnetism have anything to do with such antics? That is what scientists of the Coast and Geodetic Survey have been trying to find out. F. P. Ulrich, magnetic observer of the survey, stationed at Sitka, Alaska, summarizes the results of five years' observations by saying in a recent report: "In general, the condition of the earth's magnetic field is no index of the quality of radio reception." Thus the fact seems to be established that the earth's baffling magnetic forces are not to blame when your radio goes on a temperamental rampage.

Mr. Ulrich observed that the aurora borealis, or northern light, which is a manifestation of the earth's magnetism, occurs in greatest brilliancy on magnetically disturbed days. The aurora causes difficulties in cable transmission, he says, but "observations seem to indicate that good radio reception is very much more apt to occur than poor reception during a bright or faint aurora." That absolves the aurora, magnetism's magnificent advertisement, from suspicion of being the monkey wrench in radio's machinery.

In an effort to unravel the greatest of all scientific mysteries—the earth's magnetism—scientists have been making methodical, monotonous, deadly dull routine observations for years. They record the daily and hourly variations in the earth's magnetic forces at widely scattered observatories from Samoa to Honolulu and Alaska. An effort is also made to connect these records with other phenomena such as earthquakes, sun-spots, and the aurora, and with radio reception and telegraphic and cable disturbances. It is hoped in this way to ferret out nature's most profound secret—the secret of those magnetic forces which, up to now, have defied scientific analysis.

A NEW SUN-SPOT

A LARGE spot on the sun, some 30,000 miles long, was on line with the earth on July 7 when brilliant displays of northern lights were seen, and a still larger one was at the center about July 12. It was close to the center of the sun as seen from the earth, even closer than the one apparently associated with the recent aurora displays. Possibly more magnetic disturbances, like those which tied up telegraph lines, and still more intense northern light displays, may have come at that time. Astronomers point out, however, that the connection between the aurora borealis and the sun-spots is still a mystery, and so the new spot may fail to produce results.

Experiments made by Dr. Carl Stormer, a Norwegian scientist, indicate that the auroral displays are similar to the effects that occur inside a vacuum-tube when a high voltage electric current is passed through it. Cathode rays are formed which act on the minute amounts of gas remaining in the tube, and cause it to glow. Sun-spots are huge cathode ray tubes, giving off these rays at all times. When a spot is in the center of the sun as seen from the earth, that is, when it faces the earth, the rays are aimed at us. They are bent by magnets, and so the magnetic poles of the earth draw them in. As they reach the rarefied gases in the earth's upper atmosphere, they are made to glow as in the vacuum-tube.

In laboratory experiments Dr. Stormer aimed cathode rays at a magnetized sphere in an evacuated chamber, and miniature streamers similar to those of the northern lights were produced.

ARCTIC MUMMIES IN NATIONAL MUSEUM COLLECTION

THREE mummies from the Arctic caves of the Aleutian Islands, similar to those just discovered by the Stoll-McCracken Expedition, have been in the possession of the U. S. National Museum for more than 50 years, according to a statement by Dr. Aleš Hrdlička, anthropologist of the museum.

The museum had a number of these strange mummies that date back to about the seventeenth century, before the white man penetrated the Arctic. For a time some of them were on display. But they are rather gruesome exhibits and they had a somewhat morbid fascination for the public, so they were finally macerated and the skeletons were measured and examined to add to the government scientists' knowledge of ancient man in America.

The three mummies that have been preserved intact in their burial robes and wrappings are those of an adult, a child of about ten years and a young infant.

A careful study of the Arctic burials was made by Dr. William H. Dall, of the Smithsonian Institution, in the 1870's. The islanders were loath to talk about the ways of their ancestors. But Dr. Dall wandered through the maze of rocks and caverns, and discovered a number of the mummy caves. The bodies were wrapped in skins and grass mats and hidden in the caves, partly because the islands afford few good places for interment, and partly because the caves offer the best protection against the chill fog and dampness of the region. Secrecy was important, because the body of a famous whaler of the tribe, or even the possession of a whaler, would bring skill in whaling to any one who posssessed them. To foil robbers, and to keep the skill of the dead hunter in his family, the dead man was entombed as cautiously as possible.

A rarer type of mummy than those wrapped in skins and mats has been seen in the islands by explorers, but no specimens have ever been brought away. These mummies are not encased, but have been placed in the caves in positions resembling life. Dead men clad in wooden armor, it is said, stiffly grip their spears as they wait to

fight the shadowy enemies of another world. Dead women sit holding their bone needles and embroidery as in life. And old men have sat for centuries posed beside their drums, as if waiting to play for the winter dances.

DISCOVERY OF PTEROSAUR BONES

A FOSSILIZED wing-bone of a pterosaur, recently sent from Oregon to the U. S. National Museum for examination, has given the first indication of how these great flying lizards of dinosaur days lightened their bones to combine a maximum of strength with a minimum of ballast. Birds, the most successful of modern flying vertebrates, have thin-walled, hollow bones with air spaces inside, on the plan of the tubular metal braces and struts of the larger airplanes. The pterosaurs, this specimen shows, had not evolved so highly perfected a device. Their bones were not completely hollow, but the cavity was filled with a very light, spongy webwork of bony tissue, which served as cross-braces to strengthen them.

All bones of flying lizards hitherto found have been crushed flat, Dr. J. W. Gidley, paleontologist of the Museum, explained. This gives the present specimen unique interest and importance. A further note of interest is found in the fact that this pterosaur comes from Oregon, and represents the farthest west of all flying reptile finds to date.

The find consists of a single bone, the humerus or upper arm-bone. It is about eight inches long and one and one half inches in diameter at its ends. At the slenderest part of the middle of the shaft it is three quarters of an inch in diameter.

The upper arm-bone accounted for a relatively small part of the wing-span in the flying reptiles. The forearm-bone was somewhat elongated, and what corresponded to the finger-bones of one of the fingers were greatly exaggerated. Only one of the fingers supported the wing; the others were short and apparently of use in clinging or climbing.

THE YELLOWSTONE CANYON

A NEW history of the Grand Canyon of the Yellowstone will need to be written as a result of geological research by members of the Princeton Summer School of Geology and Natural Resources who have just completed an investigation of the canyon and the area bordering this great natural ditch.

When the first transcontinental expedition of Princeton geologists, traveling in the special geological Pullman "Princeton," as well as students, visited Yellowstone Park in 1926 they obtained the first hints that the origin and history of the canyon needed reexamination and possible revision. This year the area was restudied by the geologists under the leadership of Professor R. M. Field, director of the expedition, and Professor O. T. Jones, of the University of Manchester, England, one of the foreign guests.

During the Tertiary period, the age of mammals, some tens of millions of years ago, the geologists concluded, a canyon of nearly the present dimensions was excavated. This great waterworn depression was later blocked by volcanic lavas near its lower end and filled to the brim with sediments. The present canyon from the upper falls of the Yellowstone to the lower end was largely reexcavated only a few millions of years ago. The digging of the new canyon by the river's water has taken place since the great Glacial epoch, when ice covered much of America.

"One of the most striking conclusions resulting from this discovery," Professor Field declared recently, "is the fact that the lower fall of the Yellowstone has occupied its present position since the later Tertiary period when the first excavation of the canyon was made."

Professors Field and Jones will publish further details of their discoveries in the fall after the return of the expedition which is now enroute to the Pacific coast. The new information obtained suggests to these experts that the stratigraphy and petrography of this frequently visited region needs revision upon the maps and in the geological records.

NEW STYLE CABBAGES

FARMERS who have been working for years to produce bigger and fatter cabbages are now anxiously hunting for smaller and slenderer varieties. Old style eight-pound cabbage heads rot in the markets, because the modern housewife can no longer be induced to haul home enough cabbage to last her family a week, according to Dr. C. H. Myers, of Cornell University, who is working on this serious farmers' problem.

New style cabbage varieties must weigh only about two or three pounds, because small families, storing their food in apartment house kitchens, live rather literally from hand to mouth. Through experiments with smaller varieties, now in progress, Dr. Myers hopes to show how farmers can get a higher yield to the acre, so that they will not lose money by raising smaller and cheaper heads.

Several years ago, Dr. Myers proudly displayed a nicely formed little cabbage head that he had produced on the experiment farm. All the farmers who saw it shook their heads and said it might be a promising variety, but it was much too small to be practical. Now the good points of this scorned cabbage head are being reconsidered.

One of the newest varieties produced in the cabbage-breeding experiments is a real red-head cabbage. This magenta-colored vegetable is far redder than the purplish variety ordinarily known as red cabbage, Dr. Myers says. Another new type is a cabbage with grayish purple leaves. These varieties are being studied partly to trace the inheritance of the purple sun color in the outer leaves of this strain of cabbage. The experiments have an immediate practical value, however, since home economic experts approve highly of the gay tinted cabbage leaves for making attractive salads.

VOYAGE OF THE MARION

WHEN the *Marion*, staunch little steel vessel of the U. S. Coast Guard, leaves Sydney, Nova Scotia, about August 1, she will have enough fuel and supplies to sail for a quarter of the earth's circumference without again

touching land. This large cruising radius will be needed, for in the voyage to the region between Greenland and Labrador, the birthplace of the icebergs, she will travel more than 3,000 miles before returning to Sydney, the northernmost point where supplies are available. The *Marion* is equipped with two Diesel engines, and is 125 feet long. Though small in size, she is unusually seaworthy.

The crew will consist of twenty Coast Guard sailors, specially selected from a large number of volunteers. With their two officers, Lieutenant-Commander Edward H. Smith and Lieutenant N. G. Ricketts, they will make up the personnel of the expedition. But they will not confine their attention to icebergs, for there are numerous other problems that demand solution, particularly those concerned with the ocean currents in this little-known region.

The Hydrographic Office of the U. S. Navy will also gain valuable information as the result of the expedition. Hundreds of soundings will be made in 50,000 square miles where no depth measurements have previously been made. The *Marion* will also visit villages along the Greenland and Labrador coasts, and their facilities and other pertinent maritime information will be recorded for the benefit of the Hydrographic Office.

Observations of weather conditions, such as data on storm tracks, and percentages of fog for both Greenland and Labrador, will be made for the U. S. Weather Bureau. Since this region is part of the shortest air line route between the United States and western Europe, and may in the future be important in transatlantic aviation, these observations may be of untold value.

Radio amateurs in the United States will be the means by which the expedition will keep in touch with civilization. A short-wave radio set is provided on the ship, which can communicate with the United States. The American Radio Relay League has requested that amateur operators listen carefully, in order that messages from the *Marion* in the far North may be picked up.

ITEMS

Two earthquakes in the Pacific Ocean within six hours, one of which caused severe shaking in southern Alaska, and the other in the Fiji Islands, was the record established on Thursday, June 21. Earthquake experts of the U. S. Coast and Geodetic Survey at Washington located the positions of the quakes by means of data sent to Science Service. The first one, at 5 hours 40.4 minutes a. m., Eastern standard time, was centered at latitude 18 degrees south and longitude 179 degrees west. The position is among the Fiji Islands. The second quake happened at 11 hours 26.7 minutes a. m. It was centered at latitude 60.5 degrees north and longitude 152 degrees west. This is about the position of Cook Inlet, Alaska, and not far from Seward.

METHODS of removing the brown stain that often disfigures Indiana limestone used for building facing and trim were announced to the American Society for Testing Materials at Atlantic City by Lee Huber, research engineer, of Bedford, Ind. A jet of steam played on the stain followed by bathing with 5 per cent. formic acid solution is one cure. A poultice moistened with a 5 per cent. solution of sodium carbonate also gives results. Mr. Huber traced the stain to seepage from the cement used to back the stone. Prevention of the stain is aided by the use of white portland cements.

FLOODS recently experienced in Oklahoma, Missouri, Kansas and Arkansas can be blamed more on after-effects of the floods of last year than to abnormally high water at present. According to Dr. H. C. Frankenfield, in charge of the flood section of the U. S. Weather Bureau, the break of a levee on the upper St. Francis River, in southeastern Missouri, was due to the fact that it was new, and had not had time properly to harden. The older levees in this region were destroyed last year. Had this break not occurred, and flooded the near-by region, the water might have continued down stream, and produced heavier floods below, he stated. At present, the flood on the Arkansas River is not great, but it is considerable on the White and Black rivers.

THE increasing use of antitoxins and inoculations against specific diseases is presenting a new problem to scientists. To diagnose a number of diseases, agglutinization tests are now made on the patient's blood serum. However, agglutinization may also occur as a result of previous immunization against certain diseases, for example, typhoid fever. A new serum that distinguishes between agglutinization due to an infection and that due to immunity, has been perfected in the case of undulant fever (abortion disease in cattle) by I. Forest Huddleston, of the department of bacteriology at the Michigan State College.

THE vanilla flavoring in ice cream survives the freezing, P. S. Lucas, of Michigan State College, reported to the American Dairy Science Association meeting in Madison, Wis. The flavor does not freeze out when the cream hardens, neither does it lose intensity with age. Eight kinds of vanilla flavoring were tried in identical ice cream mixtures and samples were tested regularly for 214 days. The long storing had no effect on the flavor. Souring or the use of the homogenizer by the dairyman formerly were considered the cause of cream curdling, or feathering, when poured into hot coffee. But experiments at the University of Illinois have shown that this condition is due to the presence of calcium salts in the cream.

A NEW find of three skeletons of the famous Cro-Magnon race of stone age times is reported from the Vallee du Roc, Charente, in France. The remains were those of a man about fifty years old, of a woman and of a youth just cutting his first wisdom tooth. They had apparently all been buried in a cave, the roof of which later fell, covering their graves still more deeply with rough blocks of stone. This rock fall had considerably damaged the skeletons.