SCIENCE NEWS

Science Service, Washington, D. C.

COAST GUARD EXPEDITION TO THE ARCTIC

DOES a branch of the Gulf Stream dive to the bottom of the Atlantic Ocean and emerge again far north in Baffin Bay? Is the Labrador current a continuous overflow from the Arctic Ocean? Does the east Greenland current stretch all the way across to Labrador? Why is the west coast of Greenland so much warmer climatically than Baffin Land in the same latitude?

These are some of the outstanding questions of Arctic oceanography that may be solved during the coming summer. About July 10 the U. S. Coast Guard vessel, *Marion*, will sail from Boston for Sydney, Nova Scotia, on the first leg of an expedition to the region between the coast of Labrador and Greenland, an area where the icebergs are supposed to originate. Oceanographically, very little is known about this region at present.

The *Marion* will be under the command of Lieutenant-Commander Edward H. Smith. He has had ten years' service in the ice patrol work, and is also a trained oceanographer, for he spent two years in Europe and several more at Harvard University in oceanographic research. Lieutenant N. G. Ricketts is his first officer, and he also has had extensive experience in the ice patrol.

After April 15, 1912, when the White Star liner *Titanic* struck an iceberg off the Grand Banks of Newfoundland, and went to the bottom with the loss of 1,500 lives, an international convention "for the safety of life at sea" was held at London. From this there resulted the Ice Patrol of the U. S. Coast Guard. Every March two staunch Coast Guard vessels sail from Boston to the ice fields, and remain there until the dangerous season is over, usually about the middle of July. Twice a day these boats broadcast by radio to near-by liners the location of all the ice in the vicinity, so that they can head southward to safety. Since the Coast Guard began this work fourteen years ago only three lives have been lost by collision of a ship with ice.

The science of oceanography has helped to a great degree in solving the problem of making ships more safe in the ice field, Commander Smith told Science Service. "Little was known," he said, "before 1912–14 regarding the drift of the bergs, their rate of melting, and the degree of danger which they formed to passing traffic; except for the fact that they mostly came from Greenland, and that they finally melted in the offshore waters of the Atlantic, which appeared considerable of a mystery.

"Over 3,000 observations," he continued, "have been compiled during the last ten years by the ice patrol vessels. The program has consisted in securing observations of temperature and saltiness at various depths in various positions, carefully selected in the danger area. The ocean currents have been computed from these data in accordance with a mathematical formula. It is based upon the principle that ocean currents are due to differences in the specific gravity of the water. Water will flow from the place where it is relatively light to another region where it is proportionately heavy. This, combined with the fact of earth rotation, permits us to issue regular weekly current maps, similar to the better known weather maps issued daily by the U. S. Weather Bureau.

"In the course of this work we have secured quite a correct picture of current and ice conditions in the immediate area south of Newfoundland, and near the steamship tracks, but little is known of the wild and unexplored stormy region northward between Labrador and Greenland. Our expedition will enter these foggy waters and, it is hoped, will snatch from them a long-contained mystery."

At present the ship is at New London, Conn., where she is being fitted for the expedition. She will be equipped with apparatus for measuring the temperature and saltiness of the ocean water, for observing the ocean currents, and other apparatus unusual in such a boat.

One of the most important instruments with which she will be provided is the sonic depth-finder. With this an accurate measurement can be made of the depth of the water, with far more precision and speed than with the old type sounding-line. This consists of an oscillator, operated electrically and located on the ship's hull, which sends out sound-waves. These travel to the bottom, and are reflected as an echo. Microphones located elsewhere on the ship's hull pick up this echo. The speed of sound-waves through water is well known, and so, from the time it takes the waves to return, the depth can be measured.

Every half hour, day and night, on her cruise, a measurement will be made of the depth. The expedition will sail over an area of 50,000 square miles where no sounding has ever been made and the results will be of great scientific importance.

The Coast Guard expedition will not be alone in this area during the coming months, for the Danish Government is sponsoring a similar exploration with which the Coast Guard will cooperate. The Danish party, on the steamer *Godthaab*, has already sailed from Copenhagen. It is in charge of Commander Riis-Cartensen, of the Royal Danish Navy. Both biological and oceanographical in its scope, it will cover the entire range of west Greenland waters.

TESTING FIREPROOF SAFES

TWO buildings, one five stories high, in the heart of Washington, and within less than a mile of the White House, were burned to the ground on June 17 while firemen stood by and watched. No effort was made to save the buildings, though they contained large amounts of lumber and other material, as well as 35 safes, filled with records. The fire was started by S. H. Ingberg, Bureau of Standards scientist.

This unusual fire was made as a scientific experiment, part of a series made by the fire protection section of the Bureau of Standards, of which Mr. Ingberg is in

charge. Previous tests have been made in a large concrete chamber of the bureau, but never before has it been possible to make a careful study of conditions at a full-sized fire, for which preparation had been made months in advance.

With the demolition of many old buildings in Washington, in the triangle south of Pennsylvania Avenue, in order to make way for the government's extensive building program, the idea was conceived of burning one or more as an experiment. Thus the expense and trouble of wrecking them by the ordinary means was saved, and at the same time data of great value to manufacturers of safes, engineers and architects have been obtained.

The two buildings were at 1007 and 1009 Little B Street, opposite the north side of the National Museum, and between the Capitol and the White House. One was two stories high, 22 feet wide and 75 feet deep, while the other was five stories high and 30 by 75 feet. Both had brick walls, and open joisted wood floors, about an inch thick, and very few partitions. The elevator shafts were open and the stairways inadequately protected. According to the bureau officials they were typical of the non-fire resistive type of structure built some years ago, and still very common in American cities. Until last fall they had been used as warehouses.

All the surrounding buildings had been completely demolished several months ago. The two under test were loaded with waste lumber and such material, the weights varying from 7½ to 30 pounds per square foot of floor area. Thirty-five safes, submitted by various manufacturers, were placed at different locations in the buildings. These were numbered inside the doors to permit of identification. They were filled with useless records, so as to determine the degree of protection that they afforded. Each safe also contained a thermometer to record the highest temperature within during the fire, and a clock arranged to stop with a heavy jar. These give records of the time at which each safe fell through the burned-out floor to the ground below.

Mr. Ingberg and his associates observed the fire from a "dugout" in an old boiler room near-by. By means of thermocouples placed in open spaces at 50 advantageous points within the burning buildings, and at 45 points in the débris, connected by wires with instruments in the dugout, the temperatures were measured electrically.

For days after the experimental fire temperature observations were being continued. Several days after the fire the thirty-five safes were still among the débris and too hot to permit them to be removed and opened.

Within an hour after starting the fire the buildings were completely gutted and temperatures estimated to be as high as 3,500 degrees F., above the melting-point of iron, had been reached. Within 15 minutes after the start of the fire some of the thermocouples in the building, by which the temperatures were measured electrically, had reached 2,800 degrees, at which point they melted, and stopped working.

THE MEXICAN EARTHQUAKE

PROBABLE damage and loss of life at Oaxaca and other towns in southern Mexico as the result of an earthquake at 10:14 P. M. Saturday, June 16, was announced by Science Service on Sunday, within 20 hours of the time of the quake, and before reports from the most greatly damaged area had reached the United States. This announcement was made possible by earthquake wave messages received at six American and Canadian seismological observatories, relayed to Science Service by telegraph and interpreted by the U. S. Coast and Geodetic Survey.

This Science Service earthquake-reporting network allowed the locating of the center of the quake at latitude 14 degrees north and longitude 95.5 degrees west. This point is in the Pacific Ocean about 125 miles off the coast of the state of Oaxaca, and close to the Isthmus of Tehuantepec, in which great damage was reported. Vera Cruz, which first reported shakes, was some distance from this center. The Dominion Observatory at Ottawa, Canada, reported that the tremors continued for six hours, while the Meteorological Observatory at Victoria, B. C., characterized it as "very severe." Other stations reporting their records were those of Georgetown University, Washington; St. Louis University, St. Louis; the University of California, Berkeley, and the U. S. Coast and Geodetic Survey at Tucson, Ariz.

A severe earthquake occurred at very nearly the same center on March 22, and other shocks, also reported by Science Service, were felt in the same region on April 13 and 17. One of these quakes broke open a tomb in the mysterious city of Monte Alban, near Oaxaca, revealing valuable jewel treasures that Mexican archeologists believe will help solve the enigma of the strange prehistoric race that lived there.

EUROPEAN ROADS

EUROPEAN roads, which fifteen years ago were superior to the American automobile trails of those days, are now far inferior to the hard-surfaces available for touring here in America, Tore Franzen, of Detroit, told the Society of Automotive Engineers recently.

The main roads of the Old World, once the trade routes of the civilized world, have deteriorated as a result of war and lack of proper maintenance. The old stone roads that in many cases date back to the Romans are durable, but very rough, narrow, highly crowned and surfaced with cobblestones and slabs. Other roads are of dirt, rutted and rough, with only the most necessary repairs made by the peasants who live alongside them.

There are two kinds of European motorists, Mr. Franzen discovered in surveying the situation. The dashing sportsman drives his own car and insists upon speeding over poor roads. Most European car owners, however, employ chauffeurs and desire to travel in safety and comfort.

American automobiles are sometimes criticized because they shimmy and shake on European roads. Rough roads and the low tire pressure used cause the springs to deflect deeply and give the riders severe jolts. Thin oil plentifully applied is considered in Europe to be a universal cure for any slight spring or shock-absorber squeaks. But the oil simply puts most shock-absorbers out of commission and makes the springs weak. Mr.

Franzen recommended to the automotive engineers that special springs and shock-absorbers be designed for the cars exported to the bad roads area of Europe, which includes most countries except England and Switzerland.

THE BRAIN OF THE PORPOISE

MAN'S pride in his well-developed cerebral hemispheres is dealt a severe blow by the statement of Dr. Orthello R. Langworthy, associate in anatomy at the Johns Hopkins Medical School, that the porpoise, generally considered a very stupid animal, has a much larger brain and bigger and more convoluted cerebral hemispheres than man himself.

Dr. Langworthy has been studying the brains of ten specimens caught by himself and associates off Cape Hatteras last February in an expedition financed by the Linton Fund. Porpoises have reached a new importance in the scientific world because of the growing scarcity of whales, which they closely resemble.

As a matter of fact the porpoise is a more highly developed animal from the evolutionary point of view than man, for the porpoise, after reaching the cat or dog stage of development, took up an aquatic habitation and underwent further evolutionary changes to suit his new environment. The foreleg changed to a fin and the hindleg disappeared entirely. The skull broadened at the sides and shortened in front so that the nose was forced up above the eyes where it became a blow hole, while the olfactory nerve was cut off entirely. On the other hand the nerve of hearing is very well developed.

These changes in the brain are now being studied with a view to explaining the evolutionary changes noted in the skull and to determining how much of the change is due to the aquatic environment.

ITEMS

GREASE-MEASURING devices, such as used by filling stations in servicing automobiles, may soon be standardized. Tentative specifications and tolerances for grease-measuring devices were adopted in Washington at the twenty-first National Conference on Weights and Measures. While final adoption by the conference is never made in less than a year's time, this action means that during the next year a close study will be made of the usefulness of the code. In case of standardization, motorists are promised that they will no longer need to worry about their garage men failing to give them the quantity of lubricant they call for.

WEATHER maps now made by San Francisco Weather Bureau officials, covering the Pacific Ocean as far as the Aleutian Islands and the Philippines may aid in long range weather forecasts of the California region and the western United States. So the members of the American Meteorological Society meeting at Pomona College were informed by L. E. Blochman, of Berkeley. In general, said Mr. Blochman, seasons tend to follow the conditions prevailing during October and November, when the California rainy season opens. Sometimes, however, as happened last season, they change. He believes that study of the low pressure area around the Aleutian Islands is of considerable importance.

SOLAR "flames," or prominences, that move out from the sun with speeds as great as 20,000 miles a minute, were described to a meeting of the Astronomical Society of the Pacific by Ferdinand Ellerman, of the Mt. Wilson Observatory. These prominences have been studied by means of the spectroheliograph, an instrument that permits them to be photographed in the light of a single color. They consist largely of hydrogen. Among the interesting ones that he has studied recently, Mr. Ellerman told of one that expanded from a height of 100,000 miles above the sun's surface to more than 200,000 miles a few minutes later.

DEMOCRACY is an affair of the biologists and not the political scientists. This is the conclusion reached by Dr. Michael F. Guyer, head of the zoology department at the University of Wisconsin. For a democracy to survive, it must be carried on by a race having certain qualities of disposition, character and intellect. Because these things are inherited just as a man inherits physical characteristics, such as color of skin, hair and eyes, Dr. Guyer contends, the development of a race having the qualities necessary to operate a democracy successfully rests with the biologists.

GOPHERS, or their ancestors of the Stone Age, cultivated the habit of burrowing assiduously, finding it a great help in the struggle for existence, E. C. O'Roke, University of California investigator, reported to the western section of the American Association for the Advancement of Science. This habit was developed by many different orders of mammals, particularly those belonging to the rodent family, no matter how wide their zoogeographical distribution.

TWO icebergs, one of large size, were within a few hundred miles of the transatlantic steamship routes, on June 18, according to reports received at the U. S. Navy Hydrographic Office in Washington by radio from the Ice Patrol cutter *Modoc*. The *Modoc* was at the time on the New York-Southampton lane, but no ice was in sight. The two bergs, then off St. Johns, Newfoundland, were reported to the *Modoc* from other ships.

EXTRA doses of ultra-violet light are not so good for plants as for animals, it appears from experiments carried on in London by E. M. Delf, K. Ritson and A. Westbrook, working at Kew Gardens and Bedford College. The experiments were undertaken with the idea of finding the possible effect of the light on plants brought from the south to northern countries where there is much less sunshine. Seedlings and older plants were given treatments with quartz mercury vapor lamp, similar to those given human beings. Germination and growth were retarded and in older plants, leaf-formation was partially inhibited and flower-formation and budding were held back.