

SCIENCE NEWS

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SCIENTIFIC WORK OF THE "MAUD"

TIDAL observations made during the long three years' stay of the *Maud*, Captain Roald Amundsen's ship, in Arctic ice north of Siberia indicate that there is no Arctic continent or land mass in the great unexplored area between Alaska and the North Pole. This was pointed out by Dr. Harald U. Sverdrup, in charge of the scientific work of the expedition, in a lecture to the Carnegie Institution of Washington.

Using an electrical recording current-meter designed and constructed on board the ship, Dr. Sverdrup made observations at the Bear Islands over a period of fourteen months. He discovered that the tidal wave reaches those islands off the north coast of Siberia in such a way that it "seems to come directly across the Arctic Sea without meeting obstructions formed by land."

The *Maud* left Seattle on June 3, 1922, to penetrate into the drift-ice north of Bering Strait and, if possible, to be carried by it across the Arctic Sea to the vicinity of Spitzbergen, Dr. Sverdrup explained. Closed in by the ice at Wrangle Island on August 8, 1922, the *Maud* drifted for two years west northwest to the region north of the New Siberian Islands. In an attempt to return to Nome, Alaska, in 1924, the vessel was again caught in the ice at the Bear Islands, 800 miles west of Bering Straits, and it was not until August 22, 1925, that Nome was finally reached.

Dr. Sverdrup explained that the principal object of the expedition was to make scientific observations of terrestrial magnetism, weather, the Aurora Borealis, sea depth, temperature and air currents. By means of small balloons the air currents of the upper part of the atmosphere over the Arctic were studied. The temperature of the air from the ice to an altitude of about 6,000 feet was studied directly by recording instruments lifted by kites. The most interesting result of these observations is that the temperature in winter is always lower close to the ice than at an altitude of 1,000 feet. The lowest temperature is found at the ice during calm weather.

The lowest natural temperature that can be attained in the region visited by the *Maud* is minus 50 degrees Fahrenheit which indicated that the heat lost to the upper air and gained from the warmer sea water below would equalize at that temperature.

IDENTICAL TWINS

ARE you left-handed? Does the hair whorl on top of your head turn from right to left? These, with other points, may indicate that you are one of a pair of identical twins, even though you were born alone, according to Professor Horatio Hackett Newman, biologist at the University of Chicago, who for many years has conducted research into the causes and modes of twinning.

Identical twins are two halves of one person: the right and left components of an originally single individual, which very early in its growth abnormally split into two

equal parts, each part reorganizing itself and growing into separate, complete persons. Obviously such twins are exactly alike in heredity, appearance and sex, and are the type of twins who cause so much confusion among their friends, because they "can't tell them apart."

These twins are identical with this difference—each is the mirror image or image reversed of the other in certain parts of the body. It has been noted that one of the pair is naturally right-handed, the other left-handed, unless trained otherwise. In one the hair whorl on the head turns clockwise, that is, from left to right, in the other the whorl turns counter-clockwise, from right to left. The whorls of the finger prints are identical except that in one the curves of the whorl turn clockwise, in the other counter-clockwise.

Growth conditions frequently do not favor the two equally before birth, consequently one dies very early in its development (or as happens more rarely, is absorbed into the growing body of the other) leaving the other twin to make its appearance in the world alone. Such is the explanation of the solitary left-handed individual.

This early splitting of the growing germ cell is an unnatural condition caused, according to Professor Newman, by a slowing up or pause in the rate of growth at a critical period. When normal developmental conditions return, the single original growing point is so weakened that often two new points at equal distances from the original point arise, and these form antagonistic growing points, which split the organism apart, forming thus two separate embryos. Sometimes this separation is incomplete and the so-called Siamese twins are formed.

The other type of twins, fraternal twins, are always formed from two germ cells that happen to be fertilized at the same time. They develop normally into two individuals who are not alike in heredity or appearance and often are not of the same sex. They were born at the same time, and there the similarity ends.

COLD STORAGE METHODS IN CANADA

IMPROVEMENTS in refrigeration methods which may result in wide-spread changes in systems of storing and shipping perishable foods are being put into effect by a group of shipping experts, fish distributors and officials of the Atlantic Experimental Station for Fisheries of the Canadian Government.

The central idea of the new method is that foods preserved by freezing should be chilled rapidly instead of slowly, as has been the practice in the past. Filets of large fish are wrapped in waxed paper and packed tightly in narrow cans, sunk in a rapidly circulating bath of very cold brine, kept constantly at a temperature near zero Fahrenheit. Small fish are wrapped and packed in whole. This process freezes the fish rapidly, preventing the formation of large ice crystals which occurs when the chilling proceeds at a slower rate, and which is very deleterious to the fish when kept for more than a few

days. Fish preserved by the new rapid-freezing method have been kept for six months, and when thawed and cooked could not be distinguished from freshly caught fish.

Still more rapid methods of freezing are being sought by the experimenters. Pieces of haddock were hung on wires and submerged in liquid air, and kept in big thermos bottles, which furnished a temperature of some 300 degrees below zero Fahrenheit. At once the liquid boiled and hissed like water when a white hot iron is plunged into it, and in a fraction of a minute the fish was taken out, frozen white like one's ear in a blizzard, and brittle as taffy. There was no moisture on the flesh, no slime, no crystals of ice in the tissue.

Liquid air freezing is still too expensive for commercial use, but the price of the cooling agent could be reduced to a few cents a quart, refrigerating engineers claim, if the fish industry were to adopt the technique widely, since the manufacture of liquid air on a large scale for this purpose would bring a lower price.

The use is being considered also of solid carbon dioxide, the soda-water gas which is more easily handled than liquid air but not so cold. Seventy degrees below zero Fahrenheit is the melting point of carbon dioxide, and like liquid air it gives a dry, pure cold.

THE EFFECTS OF LOSS OF SLEEP

AFTER staying awake two nights in succession, an individual may still be captain of his muscles and reasoning powers, but his eyes and ears may begin to play him queer tricks. This is shown in the scientific report of the sixty-hours-without-sleep experiment at George Washington University, which will shortly be published by professors of the medical school and psychology department who conducted the tests.

The eight students who took part in the insomnia experiment were able to make as good records in tests of their mental alertness after two sleepless nights as they made at the beginning. But tests of their senses showed that efficiency of sight and hearing fell off as fatigue increased.

In addition, one student reported that after forty hours of wakefulness he happened to be on the street at night and clearly saw a man watering some plants, though he realized at the time that no one would try to stand on the narrow ledge where the phantom appeared. This illusion and others similar to it turned into posts, flowers and other familiar objects when the student approached them, but the illusions continued to trouble him, even in full daylight. Another subject reported similar disturbances of vision from the vigil.

A number of practical tests connected with automobiles were tried out on the subjects of the experiment. The report states that students were able to park automobiles in small space dextrously after two nights of wakefulness. But when they tried driving along a road, effects of fatigue became evident.

Dr. F. A. Moss, who directed these tests, says: "It seems that so far as short operations are concerned, efficiency is not decreased by prolonged periods of wakefulness, but

continuous driving is far from a safe undertaking after 35 or 40 hours of wakefulness. Driving ability is little affected by the lack of sleep, but the monotony and rhythm of the moving car are likely to dull the wits of the subject and induce sleep in spite of his determination to keep awake."

The medical investigators, who tested the physical condition of the students, reported that loss of sleep caused pathological changes manifested by a decrease in red blood cells and hemoglobin and an increase in white blood cells. Blood pressure decreased, but no change was found in blood sugar or in basal metabolism. After eight to ten hours of sleep, the students were pronounced physically normal again.

The investigators believe that, just as with food, the quality of sleep may be more important than the amount. "Sleep has not only length but depth," they point out. "The first two hours of sleep are much deeper than the last two, and it might be possible to cause the sleeping mechanism to work faster, just as by a series of conditioned reflexes we can make the salivary glands work faster." But this, they add, could only be determined by a series of carefully planned experiments.

POLLEN ANALYSIS AND HAY FEVER

JUST when the hay fever battle of 1925 is over comes news that may enable hay fever fighters to attack the enemy at somewhat closer range in the next encounter. The new trench that has been taken is analysis of grass pollens that cause hay fever, in order to isolate protein substances in the grass.

This is the third step in conquest of hay fever by pollen treatment. Back in 1865, Dr. Blackley, an Englishman, proved that the malady was caused by pollen of certain plants. In 1902, German investigators showed that the protein is the part of the pollen grains which has power to poison individuals, causing the result that we know as hay fever symptoms.

Now, three distinct protein substances have been isolated from timothy and orchard grass pollen, and the power of these chemically pure substances to cause hay fever symptoms has been tested. Results of this work are reported by Drs. D. B. Jones and F. A. Csonka, of the U. S. Protein Laboratory, and by Dr. H. S. Bernton, associate professor of hygiene and preventive medicine at Georgetown University.

In their tests, the three investigators found that all hay fever sufferers who had the summer type of hay fever caused by timothy and other grasses were affected by the first of the isolated substances, protein A. Fifty per cent. of the hay fever victims were also sensitive to protein B, the second substance. Protein C was negligible. No one was affected by it in the experiments.

Dr. Bernton states that he believes these findings may lead to progress in pollen treatment of hay fever. "Instead of immunizing patients by injecting pollen extract, we may be able to give them directly suitable doses of the different proteins, and immunize them in that way," he says. "Investigators have had from five to sixteen per cent. of failures in treating subjects with pollen, and

I believe that some of these failures at least are due to the fact that patients are sensitive to both A and B proteins and do not get enough of protein B, which is present in much smaller quantities than protein A in the hay fever pollens which we have tested."

A NEW COMET

A NEWCOMER to the vicinity of the earth in the form of a hitherto unknown comet was discovered at 5 A. M., Tuesday, November 17, by Professor George Van Biesbroeck at Yerkes Observatory.

Professor Van Biesbroeck located the new heavenly object while looking through the finder of the large 40-inch Yerkes telescope, Professor Edwin E. Frost, director of the observatory, said recently in reporting the discovery to Science Service. This finder is a smaller instrument attached to the big telescope and it is used to cover a larger field of the sky. The comet which had a pronounced tail was near the place predicted for Orkisz's comet, which was not visible, but there can be no connection between the objects, said Dr. Frost, for immediately after its discovery Professor Frank Ross made a photograph which showed both.

The position of the comet is given as right ascension 11 hours, 56 minutes, 33 seconds and declination 34 degrees, 55 minutes north of the equator. This is in the constellation of Canes Venatici, or the Hunting Dogs, which can be seen high in the eastern sky just before sunrise, but the comet is slowly moving to the southeast and entering the neighboring group of Coma Berenices, or "Berenices's Hair."

Until it is known just how the comet is moving, astronomers can not tell whether or not it will become visible to the unaided eye. An exact determination of its orbit will be possible when two more observations of its position are made. It is now of the ninth magnitude.

ITEMS

THE shoal in the Atlantic Ocean off Cape Hatteras reported by several merchant vessels has not been confirmed by a vessel of the navy sent to check up on the reports, according to Captain W. S. Crosley, chief hydrographer of the U. S. Navy. A radio message has just been received from the survey steamer *Nokomis* now on the way to Cuba for the regular survey season, which stated that on November 19 they spent seven hours in the region of the reported shoal but failed to find it.

By interpretation of data telegraphed Science Service from the seismograph station of the U. S. Coast and Geodetic Survey at Tucson, Arizona, earthquake experts of the survey at Washington find that a mild earthquake occurred within 150 miles of Tucson at 11:04 A. M., eastern standard time, on Thursday, November 19. As no reports have been received from other seismograph stations, the exact center can not be determined. Another report from Harvard University, of a quake which occurred at 11:21 A. M., eastern standard time, on the same day, was within 420 miles from Boston, which had no connection with the Arizona one, said Commander N. H.

Heck, in charge of the survey's seismographical investigations.

RADIO has come into the field as a means of spreading the use of Esperanto, the language designed for international use. The Esperantists of Europe have long seen in the new method of communication the best possible agency for popularizing their language. With the cooperation of Radio-Paris, one of the principal French broadcasting stations, the new tongue is to be given voice by wireless for the purpose of gaining Esperanto recruits among the millions of European radio fans. In Europe, unlike the United States, there is great confusion of tongues for the listener-in. The countries are densely crowded and a single message will have an audience made up of the users of a score of languages. This condition has given the Esperantists their opportunity. Through the agency of Radio-Paris a series of fourteen lessons in the universal language are being broadcast, and a prize of 1,000 francs has been offered for the best Esperanto student among listeners-in.

THE geological fault that caused the Montana earthquake of June 27 and 28 will be the object of a search by a government geologist, J. T. Pardee, sent out by the U. S. Geological Survey. Mr. Pardee is now on his way to Three Forks, Montana, whence he will start his expedition into the mountains, to learn if possible which of several known faults slipped and caused the quake. Mr. Pardee is a specialist on the geology of the northern Rocky Mountain region. Officials of the Geological Survey state that they do not expect to send any investigators into the southern California field because of the presence there of a number of geologists who are already at work on the source of the Santa Barbara quake.

THERE is no longer any need to crawl under the house with paper and kindling wood to thaw out the frozen water pipes, and risk burning the house down or suffocating. A German electrician suggests a means of thawing them out with electricity: The ordinary house current is reduced to a voltage that is not excessive by means of a transformer, and then it is sent through the frozen section of the water pipe. The heat produced by the current will melt the ice.

MOSQUITO "wrigglers," or larvae, are not smothered by the oil sprayed on their pools; they simply drown. The researches of Dr. David Keilin, working at the Molteno Institute in South Africa, and recently announced by Sir Arthur E. Shipley, run counter to the older and commonly accepted notion. Mosquitoes and their larvae, like all insects, have no lungs or gills to breathe with, such as higher animals have. They get the oxygen they require through systems of tubes opening directly to the outside air and branching inward to all parts of their bodies. Dr. Keilin discovered that mosquito larvae had certain cells in these tubes that secreted a fatty substance, which served to keep the water out. But upon experimenting with them, using oil, chloroform, strong alcohol and other liquids that dissolve fats, he found that if these protective secretions were thus dissolved, the breathing tubes of the larvae filled up with water, and the hapless "wrigglers" drowned.