

# THE SCIENCE NEWS-LETTER

A Weekly Summary of Current Science

EDITED BY WATSON DAVIS

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## NO LAND IN ARCTIC SEA TIDE OBSERVATIONS INDICATE

Tidal observations made during the long three years stay of the "Maud", Capt. 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 revealed by Dr. Harald U. Sverdrup, in charge of the scientific work of the expedition, who lectured 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 14 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 from 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, and 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 6000 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 1000 feet," Dr. Sverdrup said. "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, Dr. Sverdrup found as a result of observations which indicated that the heat lost to the upper air and gained from the warmer sea water below would equalize at that temperature.

## GHOSTS SEEN BY STUDENTS IN SLEEPLESS VIGIL

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 has just been 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 40 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 dexterously after two nights of wakefulness. But when they tried driving along a road, effects of fatigue became evident.

Dr. F. A. Moss, who directed the psychology 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.

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The poisonous loco weed of the West belongs to the pea family.  
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## LEFT-HANDED PERSONS HALVES OF TWIN PAIRS

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 Prof. 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 clock-wise, 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 into 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 Prof. 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.

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POLLEN ANALYSIS HOLDS HOPE FOR HAY FEVER VICTIMS

Just when the hay fever battle of 1925 is over, and the last echoes of three billion sneezes have faded out of the air, 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 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 orchard grass 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."

#### HASHEESH PLANT CALLED MERE COMMON WEED

The hemp plant, the source of the drug hashoesh, is one of the commonest weeds of the country but there is little danger that it will seriously promote the drug habit. Hemp has been in this country for many years, having been introduced as a plant grown for fiber or oil and afterwards having escaped and become thoroughly naturalized.

"There is no reason to become excited about a sporadic outbreak of hashoesh addiction," Dr. W. W. Stockberger of the Bureau of Plant Industry, U.S. Department of Agriculture, says. "Hemp has been cultivated as a fiber plant in Kentucky and other states for many years, and wild hemp is found in rich bottom lands all the way from the Atlantic coast to the western plains. While these hemp plants are not rich in the resins from which hashoesh is made, they do produce at times at least a little of them, which the drug firms buy to make into hemp medicine. Yet though they have had ample opportunity, workers in the hemp fields have never become addicts.

"The hashoesh-producing varieties of hemp were introduced extensively into American culture a few years ago through the efforts of the Department of Agriculture," Dr. Stockberger continued; "for cannabis has a large and legitimate use in veterinary medicine. The cultivation of the drug hemp was carried on mainly in South Carolina. Large numbers of negro laborers were employed in the business, yet no cases of hashoesh addiction were reported.

"It made me smile a little when I saw the first reports that a young Mexican was 'concealing' his patch of hemp plants in a New York park. The plant grows from six to ten feet tall and requires plenty of open sunlight; concealment would not have been easy.

Recent reports of the smuggling and use in this country of the Mexican

hemp derivative 'marijuana' or 'marihuana' were no news to us," Dr. Stockberger stated. "We have had correspondence with El Paso and other border cities in Texas for agood many years about this situation. The reported effects of the drug on Mexicans, making them want to 'clean up the town', do not jibe very well with the effects of cannabis, so far as we have reports, which simply causes temporary elation, followed by depression and heavy sleep. I suspect that the Mexican bravo does not take his marijuana straight, but mixes it with something else, possibly cocaine, or a couple of shots of nescal or bad whiskey. That combination could easily bring on fighting madness."

E. P. Killip, of the U. S. National Herbarium, stated that all the various names of the hasheesh plant that are being bandied about should by rights be reduced to a single one. "*Cannabis sativa*" is the accepted title now, according to Mr. Killip. "*Indica*" and "*Americana*" were once in use, he stated, but are now no longer accepted in botanical circles.

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#### MAY GO FISHING WITH THERMOMETER

"Fisherman's luck" is a phrase which may soon be scrapped, at least as far as commercial fishing is concerned. It is now feasible to predict what the chances are of catching the staple cod or the prized haddock in a given area. The divining rod which loads the dice in the fisherman's favor is the deep sea thermometer.

This development is the outcome of oceanographic surveys recently completed by the Biological Board of Canada. The codfish, the data revealed, is particular about climate. Freezing is far too cold, and 50 degrees uncomfortably warm, in the cod's estimation. But when the temperature of the sea is within the relatively narrow range of 40 to 50 degrees, he is not forced into excessive exercise to keep warm, nor is he constantly on the lookout for cooler currents in the ocean.

Puzzled by queer in and out currents, hot and cold, through the Strait of Belle Isle, two teams of biologists, physicists and oceanographers patrolled the 100 miles of the narrow channel which separates Labrador from Newfoundland in two specially built boats, one working along the north shore and one along the south. Observations soon showed that the strait served as a gigantic mixing machine for producing layers of tepid water, and in these the codfish were found. Icy waters from the Arctic poured into the channel along the north shore, and the warm water of the Gulf of St. Lawrence made outward along the south side. Great pools of water at 40 to 43 degrees, often below the surface, occurred at the two exits of the channel, and it was there that cod proved thickest.

The cold Labrador current, flowing down into the great fishing bank on the continental shelf off Newfoundland, and the upward swinging Gulf Stream together act like the currents in the Strait of Belle Isle, and produce huge areas of "codwater", the investigators believe. Here the cod exert the same preference for water of a certain temperature that they exhibit in the channel.

This large scale production of the proper climate is given as the explanation of the prolificness of the codfish in the historic Grand Bank ground, but the scientists point out that the water which the fish will choose, occurs in huge layers and sheets, and thus the temperature must be right before the fishermen expect to catch anything.

"If fishermen would only take the temperature of the water they would soon realize how useless it is to expect the fish to strike at any given point before the conditions are right", an official of the Biological Board stated.

The advantage to be gained by making use of this simple precaution is evident from the fact that areas as hot as 60 degrees on the one hand, or colder than the freezing point of water on the other, may be only a few miles apart, with "codwater" somewhere in between.

Haddock have been found to exert a similar temperature preference. They select a climate about five degrees warmer than the cod prefer. Hence the time is not far distant when the thermometer will be regarded by fisherfolk as necessary as nets, or hooks and bait.

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#### COMICS FAVORITE INDOOR SPORT

The comic strip is the great American indoor sport; statistics have proved it. Four-fifths of all Americans between the ages of four and twenty-four watch the antics of Krazy Kat, or follow the doings of the Gumps or Mutt and Jeff, or other actors on the paper stage of the daily and Sunday journals.

Dr. Harvey C. Lehman, at the University of Chicago, has made a statistical study of the play preferences of American youth, questioning thousands of persons and tabulating their replies. At the age of 12 a maximum of 95 per cent. of boys and girls read funny papers, and the average for all persons questioned is 80 per cent.

Many of the activities which young folk like are seasonal and vary with the weather, said the investigator. The play activities of children are much more varied than those of adults. Boys are most alike in their play activities while in their teens. In the spring both sexes have the largest number of seasonal recreations, and the least in the fall of the year. Football is more confined to one season than any one activity.

Contrary to the popular opinion marbles was not found to be a game confined to the spring of the year. Reports showed that marbles were being played at one or more places during each of the three seasons studied. The interest in marbles is most pronounced in boys between the ages of 8 and 12, when about 40 per cent. of boys indulge.

Automobile riding is a form of play in which the sexes participate about equally. At the upper age limits about 75 per cent. of the girls and about 65 per cent. of the boys indulge in the pastime. About 60 per cent. of the older boys and 28 per cent. of the girls drive automobiles.

Approximately 60 per cent. of both sexes regularly attend the movies. Slightly more boys attend than the girls. Dr. Lehman attributes this to the fact that girls usually require an escort.

Contrary to the general assumption, older girls do not chew more gum than the boys. About 50 per cent. of the older boys chew in comparison with about 40 per cent. of the girls.

Having "dates" is a non-seasonal activity. There is a gradual rise of interest with increasing maturity. Between the ages of 16 and 21, 70 per cent. of all the girls have "dates" compared with only 45 per cent. of the boys with in the same age limits. This is because of the girls have dates with men older than themselves. A maximum of 75 per cent. of girls prefer social dancing to all other pasttime. The maximum number of boys who indulge is 40 per cent.

There is no seasonal variation in the amount of whistling but there is a decided sex difference. The maximum for both sexes is at the age of 10, when 70 per cent. of all boys and 33 per cent. of all girls indulge.

For some unexplained reason, said the scientist, negro boys have an intense interest in boxing.

#### RUTHERFORD TO HEAD BRITISH ROYAL SOCIETY

Sir Ernest Rutherford, the physicist who made alpha rays from radium knock hydrogen out of various light chemical elements, thus accomplishing transmutation, was elected on November 30 president of the Royal Society, Great Britain's highest scientific society, corresponding to the National Academy of Sciences in this country.

Prof. Albert Einstein is to be honored by the Royal Society by the award of this year's Copley Medal for his theory of relativity and his contributions to the quantum theory. Other awards announced are; Royal medals to Prof. W. H. Perkin for his work on the constitution of the alkaloids and to Prof. A. C. Seward for his researches on the palaeobotany of Gondwanaland, the Davy medal to Sir James Irvine for his work on the constitution of the sugars, the Sylvester medal to Prof. A. N. Whitehead for his researches on the foundation of mathematics, the Hughes medal to F. E. Smith for his determination of fundamental electrical units and for researches in technical electricity.

#### COAL AGE INSECTS HAD SIX WINGS

The earliest insects on earth had six wings - one pair of wings to match each pair of legs, according to the results of the researches of Dr. Herbert Bolton, director of the Bristol Museum. Dr. Bolton discovered the remains of these strange creatures, the first living things that ever conquered the air, in fossil material from coal age beds. Each body-segment that bore a pair of legs, he states, bore also a pair of wings, but the foremost wings were short and apparently of less use in flight than the after two pairs, suggesting the subsequent development of the modern type of insects, which all have four wings, though in some groups one or both pairs have become much modified or reduced.

Many other insects, which were already reduced to two pairs of wings, also lived in the coal age. Most notable were giant dragon-flies, some of them with a wing-spread of over a foot, and innumerable cockroaches. In fact, the coal age may well be called the age of cockroaches, so far as insect life is concerned.

## WORLD POPULATION MAY DOUBLE IN NEXT 80 YEARS

Parents in civilized lands of the not far distant future may have to get a permit whenever they want a baby.

The last 120 years have seen an astonishing <sup>increase</sup> in the population of the earth, made possible by man's exploits of her resources," G. H. Knibbs of the Melbourne Institute of Science and Industry has concluded. "He has fought disease and lengthened the span of human life. Science has increased the earth's economic possibilities, and population has increased probably as never before."

From 1804 to 1914 the world's population increased by nearly nine-tenths of one per cent. each year. At this rate, the 1,850 million human beings now on earth will be doubled in about 80 years, Mr. Knibbs calculates. In less than 250 years at this rate the world population would reach the enormous total of 14,800 millions, which economists claim the earth could not carry.

At the present time, the world still has elbow room, but some countries have practically found limits at present conditions. The density of population varies greatly in different countries. Belgium houses 636 persons for every square mile, Holland 528, Great Britain 391, Italy 329, Germany 328, Japan 295 and British India 226. Canada and Australia have the very small population of only about 2 persons for every square mile.

For the world to attain its maximum population, interracial friction must cease, Mr. Knibbs explained. A friendly attitude must exist between people, and all unnecessary variation in the density of population must disappear. Therefore nations must not limit immigration as they please.

"If man retains his present standards of living and his national prejudices and egoism, he may never reach the 5,000 million mark," Mr. Knibbs concludes. "If he becomes more economical, he may, with the aid of science, reach the 7,000 million mark. If he raises the intelligence level and makes territorial and economic adjustments, a population of 9,000 million might be possible. With highly perfected adjustments of human affairs that involve a long step ahead of the present human moral development, the ultimate limit might be 11,000 million, that is, disregarding natural vicissitudes that may wipe out the entire race."

## SIAMESE PIGS BUILD NESTS

Wild pigs make nests in Siam, according to K.G. Gairdner, writing in the Journal of the Natural History Society of Siam. In India, Mr. Gairdner says, it is reported that the pigs make nests of grass but in the evergreen jungles of Siam there is little or no grass and the nests are made of sticks. The sticks are all bitten off from the surrounding trees and they vary in thickness from the width of a finger to an inch in diameter. They are piled about a yard high and in a heap about three yards broad. The pigs tunnel beneath the nests, presumably for protection against the rain.

Mr. Gairdner found another strange nest in the jungles of southeastern Siam, on the boundary of Tenassarim, at an elevation of eight hundred and fifty meters. It was a rough shelter formed of leafy branches, thick end uppermost and supported by a thin clump of bamboo.



Mr. Gairdner says: "The branches appeared to have been arranged methodically and, looking for the mark of a knife, I found that the branches had been bitten and torn off from the tree overhead which was stripped of its smaller branches, some of which had not fallen to the ground but lay withered in the forks above. A bear's claw marks were visible on the tree, so it is a point for investigation as to whether bears form some sort of shelter during the rains."

#### AMERICAN CHEMISTS MAKE MANY NEW DYES

American chemists are making marked progress in the manufacture of dyes that rival the best imported from Germany before the war. The U.S. Tariff Commission reports that over sixty new coal tar dyes, most of which have never been made in this country on a commercial scale before, are now on the market. These are the dyes that have been imported in largest quantity up to last year.

Many coloring materials of high fastness for cotton, wool and silk, that have been in great demand, were among those produced. The severe treatment which cotton clothes and other goods receive in the modern laundry has created a great demand for very fast cotton dyes. They are exceedingly complex and hard to make, and the patents were largely in the hands of the Germans.

At the present time the American chemical manufacturer makes 95 per cent. of all dyes that are used in American textile industries. In the year 1924, nearly 70,000,000 pounds of coal tar dyes were produced by 78 firms while before the world war cut off the German market, seven firms were in operation and they made less than 7,000,000 pounds a year.

Over 3,000,000 pounds of synthetic dyes were imported last year. Of these, one half came from Germany, a third from Switzerland, and the remainder mostly from France and England.

#### BRITISH RED CROSS CALLS FOR BLOOD GIVERS

One thousand volunteers, who can be called upon to give their blood in transfusion cases, are being enrolled by the London Blood Transfusion Service, a little known branch of Red Cross work.

This service to London hospitals was organized five years ago because doctors found it so difficult to obtain blood of the right type when a transfusion was necessary to save a patient's life. The blood of each human being belongs to one of four chemical types, and an individual who is willing to transfer some of his blood can be used only if he has blood like that of the patient. The classification is based on the presence or absence of two substances which are found to be hereditary. One type of individual has blood containing substance A; a second type has substance B; a third has neither A nor B; and a fourth, which is comparatively rare, has both A and B.

To date the London transfusion corps has served 247 cases, but calls from hospitals have become so numerous that a few hundred volunteer reserves are no longer enough. The organization states that calls come in at all hours of the day and night. It has its members classified according to blood type, and within

an hour of the request the service has a volunteer of the proper type at the hospital.

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TABLOID BOOK REVIEW

BRYAN AND DARROW AT DAYTON. Edited and compiled by Leslie H. Allen. New York: Arthur Lee and Company. 1925

This is a complete source-book of the new world-famous trial of John T. Scopes at Dayton, Tennessee, for the violation of the Tennessee anti-evolution statute. It contains all the official proceedings of the court, including the speeches of Bryan, Darrow and Malone, all the arguments and debates, and the opinions of the court. In addition the book also contains brief abstracts of the written testimony of the scientific witnesses for the defense which the court would not admit as evidence, and the last speech of Bryan which was never delivered. Mr. Allen has performed a service to science and to society at large in gathering all these historic documents into one convenient volume.

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A SURVEY OF PHYSICS; by Max Planck; translated by R. Jones and D. H. Williams. New York, E. P. Dutton and Co., 1925. \$2.40

About 1895 a leading American university is said to have stated in its catalog that future progress in physics lay in carrying results to one more decimal point than previously, but within a few years after this the discovery of x-rays, radioactivity and methods of studying atomic structure, the introduction of the theory of relativity and the quantum theory and still other advances, opened many entirely new fields of research which had not been dreamed of in 1895. Professor Planck, as professor of mathematics and physics at the University of Berlin, has himself been one of the leaders in this advance and is now regarded as one of the world's leading physicists. In this book are gathered together a series of lectures which he delivered at various times, describing such problems of physics as the nature of light, the quantum theory and the principle of least action. He also discusses the relation of the various theories and lays stress on the unity of physical science. The chief criticism of the book is that it lacks an index, and thus its usefulness is materially impaired.

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Some of the deep living sea plants of the Black Sea contain a larger percentage of green coloring matter than those which live near the surface.

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Plants growing near the hot springs of Yellowstone National Park remain green and in blossom throughout the winter.

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Many natives of the Amazon River region have had fingers and toes bitten off by the small piranha or cannibal fish which seem to scent blood from afar and have an insatiable appetite for flesh.

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