SCIENCE NEWS

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PUBLIC HEALTH IN LIBERIA

TEN weeks of mosquito control work by an officer of the U. S. Public Health Service cleaned up yellow fever in Monrovia, capital of Liberia. During the same period, the city's death-rate was reduced 75 per cent., till it was only one fourth what it had been at the corresponding time of the preceding year.

This was accomplished, with small funds and scant cooperation on the part of Liberian officials, by Dr. H. F. Smith, of the U. S. Public Health Service. Dr. Smith has returned somewhat discouraged because the splendid work he started has not been and will not be kept up by the Liberian Government.

However, Surgeon-General Hugh S. Cumming has expressed himself well satisfied with the work. Dr. Smith was sent to control yellow fever in Liberia, an endemic center of the disease, and did exactly that. The year before he was sent there, eight or ten yellow fever deaths occurred among the European and American residents of the city. After his arrival on the scene, there were no more yellow fever deaths and only one case in the entire city. This single case was brought in from outside, but the spread of the disease was successfully checked.

Dr. Smith started his work with a survey of the mosquito population of the city. He found that, since there is no municipal water supply, the residents have large barrels and cisterns to collect rain water during the rainy season. There are also a few shallow wells which are not protected from mosquitoes or from sewage contamination.

Three fourths of the houses in Monrovia proper were breeding mosquitoes in water barrels and other containers on the premises. Over nine tenths of the mosquitoes found breeding in such places about the city were of a species capable of transmitting yellow fever.

In addition to the open wells, barrels and cisterns, each backyard had a collection of empty tins and bottles which provided further excellent breeding places for yellow fever mosquitoes. The year before Dr. Smith went to Liberia, the American and European residents had a general "clean-up" of these collections of trash and refuse. Less than ten months later, when Dr. Smith started his work, he collected 546 truckloads of refuse from the backyards of the city, which has a population of barely 10,000.

The death-rate in Monrovia follows the period of heavy rains closely. The greatest number of deaths have occurred in May, the beginning of the rainy season. It was during this month that Dr. Smith's mosquito control measures, started only ten weeks before, brought the number of deaths down from thirty to seven.

In the course of his anti-yellow fever work, Dr. Smith made a complete survey of the public health situation in the country. He found, among other things, that the only isolation hospital was a small shack rudely made of thatch, without any sanitary conveniences, in which nine men and women, suffering from smallpox, were housed.

THE USES OF CORTIN

CORTIN, the new hormone extract prepared in a Buffalo laboratory, has kept a man suffering from once-hopeless Addison's disease alive for over six months.

"When first treated this patient was not expected to live," according to Professor Frank A. Hartman and Dr. Katherine A. Brownell, who developed the hormone extract and called it cortin. "Positive proof that the extract keeps him alive has been shown by four relapses which have occurred due to the reduction of extract. A few hours after increasing the extract, following a relapse, improvement is evident and in two or three days recovery is complete."

The extract contains the vital hormone of the cortex of the adrenal glands. When this part of the glands is injured or destroyed, death follows. Addison's disease, which is caused by destruction of this vital adrenal cortex, has always before now been fatal.

Early efforts to study cortical extracts were blocked because it was impossible to get an extract free from epinephrin, the hormone of the medulla of the gland. In 1927 Professor Hartman and associates were successful in preparing a cortical extract almost entirely free from epinephrin. Last year they developed a method of preparing a concentrated extract.

Other investigators, however, had been working on the same problem at other laboratories. In March, before the last method was perfected, Dr. W. W. Swingle, of Princeton University, and Dr. J. J. Pfiffner, of the laboratory of the Long Island Biological Association, announced a successful method of preparing a similar extract. This extract has been used at the Mayo Clinic by Drs. Leonard G. Rowntree and C. H. Greene, who recently reported that they were successfully treating cases of Addison's disease with it.

The Hartman-Brownell method possesses certain advantages over any other method, its originators claim. It is simple. Very little epinephrin is carried into solution. The extract is not irritating and because of the low epinephrin content, can be injected into veins as well as under the skin and into the abdominal cavity.

Other possible uses for cortin besides treating Addison's disease have been indicated. It increases resistance to infections, Professor Hartman reported. When rats have had their adrenal glands removed, their resistance to typhoid vaccine could be significantly increased by injecting cortin.

Wasting palsy may also be helped by cortin. In a few cases of this disease, known medically as progressive muscular atrophy, cortin has been used with some benefit.

THE SEAPLANE TESTING BASIN

DR. JOSEPH S. AMES, chairman of the committee and president of the Johns Hopkins University, has reported

to the House Appropriations Committee that the new seaplane channel for testing seaplane floats and flying boat hulls, which is being built at Langley Field, Virginia, by the National Advisory Committee for Aeronautics, will be ready for use in about six months. Aeronautic progress in 1930 was also summarized by Dr. Ames.

The testing channel is 2,050 feet long, and will be the first equipment of this character ever constructed and used, Dr. Ames said in his description of the activities of the Langley Memorial Aeronautical Laboratory, which is operated by the National Advisory Committee. A new full scale wind tunnel for testing full-sized airplanes is also being constructed at the laboratory, and will be ready for tests about the same time as the seaplane channel is finished.

Aircraft progress in the year passed is summarized by Dr. Ames as follows: Airplanes are now being purchased on a basis of proved performance. Commercial aviation is about to enter the fourth stage, in which carrying the mail will be a minor part of business, and carrying passengers and express the major interest. Previous stages have been (1) the carrying of air mail by the government planes; (2) carrying of mail by aircraft companies under contract; (3) carrying of passengers in addition to mail.

Air passengers increased 300 per cent. in 1930, over 1929. Different types of airplanes approved increased 123 per cent.; types having two or more engines increased 150 per cent.

No startling innovations for airplanes are in sight now. Improvements from now on are likely to be gradual. Problems to be solved continue to be those of working out greater safety, improved control at low speed incident to taking off and landing, higher speed in flight, increased comfort, less noise and vibration, and general reduction in cost without reduction in airworthiness.

The cowling, developed as a result of past experiments in laboratories at Langley Field to decrease air resistance of air-cooled engines, brought the committee the National Aeronautic Association's Collier trophy in 1930.

Military airplanes particularly are being studied in an effort to improve their maneuverability and controllability; commercial aircraft particularly for safety features and lowered costs.

Dr. Ames believes that the committee is at least approaching a solution for the difficulty of preventing involuntary spinning in military planes; and the difficulty of coming out of a voluntary spin without accident. The vertical wind tunnel has been of great help in studying this particular feature, he said.

The bumpiness of the air is now measured by an instrument devised at Langley Field.

The position of the aircraft industry to-day can not be called that of a large manufacturing industry, Dr. Ames agreed. Hurt by the depression of 1930, the production of airplanes slumped to half the number made in 1929, that is, to about 3,000 planes. Dr. Ames told the House Appropriations Committee that, in his opinion, aviation was forced to some extent prior to 1929.

THE CABLE BETWEEN NEWFOUNDLAND AND THE AZORES

ONE of the latest advances in telegraphic communication, a cable between Newfoundland and the Azores over which 2,500 letters a minute can be sent in one direction or 1,400 letters in each direction at the same time, was described before a recent meeting of the American Institute of Electrical Engineers. At these record rates of transmission the entire Bible could be cabled from Newfoundland to the Azores in about 20 hours and it would take only 35 hours to send the Bible from each terminal to the other at the same time.

The new cable is a part of the Western Union transatlantic system making land connection at Bay Roberts, Newfoundland, with New York City, and cable connection at Horta, Azores, with German and Italian communications, it was explained by J. W. Milnor and G. A. Randall, telegraph engineers, of New York City. The final splice was made in September, 1928.

"This cable combines the advantage of high-speed operation characteristic of the new continuously loaded cable, with the facility of duplex or two-way operation inherent in the old non-loaded type of cable. The duplex speed is several times as high as any long cable has previously been duplexed, and provides the greatest message-carrying capacity of any existing trans-ocean cable."

A cable of such great message capacity could not be built until metallurgists had discovered a new alloy of unusual magnetic properties. This alloy, known as "permalloy" in the United States and as "numetal" in England, is composed of nickel and iron and is more than thirty times easier to magnetize than soft iron, the metal which in the past has had the greatest magnetic permeability. Over 50,000 miles of fine wire made of this metal is wrapped around the copper conductor of the cable.

Another unusual feature of the cable which makes possible the sending of messages in both directions at the same time is the fact that there are "artificial cables" in both Newfoundland and the Azores which duplicate exactly the electrical characteristics of the cable actually under the water.

The resistance of the 1,341.2 nautical miles of conductor is 4,521 ohms. When a 12-volt battery is used for sending in both directions at 1,400 letters a minute, a current of only six thousandths of an ampere is received at the other end of the line.

THE WEATHER OF INDIA AND CANADA

A MODERATE winter on the Canadian prairies is the indication of certain world weather correlation formulas applied by Dr. Charles F. Brooks and Earl B. Shaw, of Clark University, in the current *Bulletin* of the American Meteorological Society.

This computation, applying to the current winter taken as a whole, including the approaching month of February, is based on weather conditions of India and Argentina during last summer.

When India's pressure is above normal for the months from January to October, the following winter in Canada

and the north central part of the United States is apparently likely to be above normal in temperature as indicated by formulas devised by Fred Groissmayr, of Passau, Germany.

During the months of 1930 before October, India, as represented by Nagpur, has had the high pressure which usually heralds a mild winter for Canada on the other side of the ocean and the globe. And although the other weather factors in India, usually associated with a mild winter in Canada, do not entirely substantiate this indication, the evidence is considered sufficiently strong to form the basis for a reasonable expectation that this winter will not be so cold as the average.

Temperatures in Central Argentina are also thought to have an influence on Canadian winters, and reports from South America add strength to the prophecy of a moderate winter. Mild temperature in Central Argentina is usually followed by a moderate winter in central North America and this year Central Argentine temperature, represented by Goya, was above normal for the months through July.

Investigations of the relationship between Canadian winters and weather conditions in distant parts of the world take into account meteorological records since 1875. During the period from 1875 to 1920, the indications for a mild winter in thirteen instances have been as favorable as they now are and in each instance a moderate or mild winter ensued.

Dr. Brooks and Mr. Shaw concluded that "While present calculations should hardly justify us in counting on a moderate winter, 1930–31, at Winnipeg as a certainty, we can say that all previous indications as strong as those for the present winter being above normal have been correct."

A MASTODON FOUND IN INDIANA

ONE of the largest mastodons ever discovered in America was found in a dried-up pond on the Charles Feldheiser farm, a mile south of Cromwell, Ind., by a 10-year-old boy who was hunting skunk holes. The boy was Donovan Harper. He stubbed his toe over a smooth object protruding from the black mud. Investigating it, he yanked out a molar tooth weighing 8¼ pounds. Elated by his find the lad lugged the treasure home. His story led Mr. Feldheiser and others to start digging on the spot where the huge tooth was found. An enormous jawbone soon was uncovered.

One of the neighbors knew a bit about geology and he advised Mr. Feldheiser to communicate with Dr. C. J. Fish, director of the Buffalo Museum of Science. Dr. Fish, accompanied by Watts Richmond, a millionaire sportsman of Buffalo, lost no time in visiting the Feldheiser farm. The Indiana farmer had wisely refrained from further digging into the mastodon "pay dirt." What Dr. Fish and Mr. Richmond saw, however, induced them at once to lease the site of the mastodon graveyard. A few days later the Richmond Expedition of the Buffalo Museum of Science, headed by Dr. John T. Sanford, curator of geology and paleontology of the museum, reached the farm and started excavation operations.

The first act of the scientists after establishing themselves on the Feldheiser farm was to have a wooden shed erected over the spot where the mastodon remains rested, to protect the bones from the weather. Armed with hand trowels, they began a long and slow task of removing a foot of muck and three or four feet of clay from the big beast's remains. The unusually large proportions of the mastodon were realized when the first tusk unearthed measured 12 feet 6 inches in length. This is one of the largest, if not the largest, mastodon found. Dr. Sanford estimates that it probably lived about 10,000 years ago in the post-glacial age.

As the soil was thrown aside handful by handful most of the parts of the giant skeleton were disclosed. The pelvis bone measured 5.3 feet across. Ribs were 4.4 feet long. The lower jaw was 3.2 feet long. The measurements of the humerus, femur and ulna, respectively, were 3 feet, 3.6 feet and 2.2 feet. Six articulated lumbar vertebrae were 1.8 feet long.

In the belief that the dried-up old sink-hole may be a regular mastodon cemetery, the Richmond expedition will conduct extensive excavations there this spring.

ITEMS

THE variability, or periodic change in brightness, of the little planet Eros, now a temporary near neighbor of the earth, is supposed to be due to differences in the reflecting qualities of different parts of its surface, as the asteroid spins about on its axis once in every five hours and sixteen minutes. The decrease in variability may be due to an improvement in the reflecting angle between the sun, Eros, and the earth, as we get closer to a straight-line position in space; for the period of variability remains the same though the amount of variability has greatly decreased. This was the interpretation placed by H. E. Burton, astronomer of the U. S. Naval Observatory, upon the dispatch from Harvard College Observatory stating that the variability of Eros has decreased fifty per cent. in a fortnight. The Naval Observatory has Eros under observation also, Mr. Burton informed *Science Service*, but the astronomers there are concentrating on accurate determinations of its location, without reference to variations in its brightness.

So much public interest has been aroused in the substance, maizolith, developed by C. E. Hartford, Jr., at the U. S. Bureau of Standards, that the bureau has had to take up the work again in order to supply the demands for samples. C. E. Hartford, who was working for a degree at Iowa State, discovered that if cornstalk pulp is put through certain mechanical operations and then combined with water, it will form a tough jelly. When this jelly dries it is tough and horny and much like hard rubber. The Bureau of Standards asked Mr. Hartford to come on the government pay-roll and work on his cornstalk rubber. Mr. Hartford came to Washington, completed his work, wrote a paper on it, and resigned. The bureau considered the matter closed and the work finished, but there developed such a continuous public demand for samples of maizolith that a man had to be put back on the cornstalk rubber detail.