SCIENCE NEWS

DOCK TIMBERS AND SEA WATER TESTS

Science Service

By testing the saltiness of harbor waters, engineers may be able to tell where the damaging shipworms, which annually destroy millions of dollars' worth of dock timbers in the ports of this country and Europe, will direct their attacks. Experiments made by H. F. Blum, of the department of zoology of the University of California, demonstrate that salinity often limits the parts of a bay in which certain species of these mollusks can live.

He has kept the *Teredo navalis,* a very destructive species of shipworm, in wooden tubs through which he ran San Francisco Bay water containing from time to time different amounts of salt. While there are species of shipworms which require the full amount of salt found in normal sea water, about thirty-five parts per thousand, Mr. Blum has found that these particular shipworms get along very well when there are only about nine parts per thousand or more of salt in the water, but that they do not like too much, the full amount in the water of the open sea. And he has found that these shipworms can stand for a while a salinity reduced to five or six parts per thousand, though their activity and boring is lessened and some of them die. But when the salinity is reduced below this amount most of the shipworms die in a few days.

This is very important in finding out whether this particular species of shipworm is likely to damage the piles of wharves in harbors where the water is made brackish by the fresh water from rivers. In such harbors where the salinity is usually about nine parts per one thousand or more, *Teredo navalis* may be expected to do a great deal of damage unless something else prevents its living. This pest is found in practically all European and American ports in the so-called temperate zone. Moreover, even if the salinity is reduced below this amount, the Teredo simply plugs up its burrow in the pile and waits until the next spring tide brings in saltier water and it can take another good drink. Even if freshets reduce the salinity to three or four parts per thousand during the spring and early summer months, a few of the borers, perhaps ten per cent., will live over and be ready to reproduce prolificly when the freshets are past and the salinity rises. Engineers say that these simple experiments lay the basis for predictions as to where trouble from these wood borers may be expected if tests of the salinity of harbor water are made throughout the year.

MOVIES IN THE HOME

Science Service

Movies in the home have been made practicable through the development of a new motion picture camera and projector that can be used by the amateur, according to Dr. C. E. K. Mees, director of the research laboratory of the Eastman Kodak Company here.

The new taking camera weighs only seven pounds and is said to be simple in operation. This reduction is obtained by the use of very small pictures and narrow width film. The special film and a carefully designed optical system have allowed diminutive apparatus without any serious sacrifice in quality of the pictures obtained.

"While the history of photography shows that most of the new developments have been due to the work of amateurs, the field of the motion picture has heretofore largely been closed to those outside the professional ranks. This has been due partly to the lack of suitable apparatus, but even more to the high cost of taking and printing the films."

The film for the new movie outfit is $\frac{11}{16}$ inch wide as against the standard width of $1\frac{3}{8}$ inch. The picture is 1 x $\frac{3}{4}$ centimeters as compared with the standard picture of 1 x $\frac{3}{4}$ inches. Five pictures on the small film consequently occupy the same length as two on the standard, so that 100 feet of the new film are equivalent to 250 feet of standard and a 400 feet reel is equivalent to the standard 1,000 feet reel. The film is of the non-inflammable type and coated with a special emulsion which enables the negative to be developed and then by a new process reversed to give a direct positive picture.

The lens is an anastigmat working at f. 3.5, permitting photographs to be made under poor light conditions. The finder is just above the lens and by an ingenious attachment changes the position of its image as the lens is focused. In this way the image is shown through the center of the field at all times. The lens has a focusing lever carried through to the back which can be focused for any distance from infinity to four feet. The diaphragm control is in the left hand corner and can there be read easily. In the center of the back is a footage indicator showing the quantity used, in feet. The crank turns nominally twice a second, taking pictures at the standard rate of sixteen per second. The camera is daylight loading, the film being supplied in a special magazine.

The new projector is motor driven and is entirely automatic in its operation. Once a film is

threaded the machine requires no further attention until the reel is exhausted. For home projection a lens of two-inch focal length is used, the picture filling a 30 x 40 screen at a distance of 18 feet and a 40 x 54 screen at 21 feet.

THE INFLUENZA EPIDEMIC

Science Service

THERE is more influenza this year than last year, but less than there was the year before last, according to telegraphic reports from all parts of the country received by the U. S. Public Health Service.

So far the epidemic has been comparatively mild in character, although there is a moderate increase in the number of deaths from influenza and pneumonia over the same period last year. December, January and February are the months in which the cases of the character now appearing are usually most frequent. Apparently there is now a considerable increase in flu during this seasonal period as compared with the same time last year, but the season of 1920-21 saw a smaller number of cases than this year.

Although the officials admit that the number of cases of influenza reported by the state officials may not give an accurate indication of the severity of the disease, the statistics show that the disease has been reported more frequently this year than last in Massachusetts, Connecticut, New York City and State, New Jersey, Illinois, Wisconsin, Missouri, Nebraska, Delaware, Maryland, District of Columbia, Georgia, Florida, Kentucky, Alabama, Arkansas, Louisiana, Texas, New Mexico and California. Reports for the two weeks ending January 20 also show a considerable number of cases present in Mississippi, West Virginia and South Carolina, but the data for last year are lacking. Many states do not make reports, and the conditions in those areas are not shown in the Public Health Service reports, while many respiratory conditions resembling influenza and variously termed grippe, bronchitis, severe cold, laryngitis are often called influenza.

The medical profession has not been able to settle on a clinical diagnosis of influenza, except in very severe cases. There is a very "widespread prevailing sickness," but most of the mild cases and some of the severe cases are never reported at all.

In years when the disease becomes pandemic, as occurred during the war, the origin and spread of influenza can be traced as it spreads along the ordinary lines of travel apparently from a definite area. During the 1918 epidemic officials were able to predict the course of the epidemic so accurately that in some cases hospitals were prepared several weeks in advance of the disease.

In years like the present, when the epidemic is comparativly mild, it is more difficult to trace its origin and spread. This suggests the possibility that there may be two different diseases which are both known by the name of influenza.

OCEAN LANES FOR TRANS-PACIFIC SHIPS

Science Service

STEAMSHIP companies will soon have to "double-track" the Pacific ocean to avoid traffic accidents, in the opinion of the Hydrographic Office of the U. S. Navy, which has announced the best eastbound and westbound routes for ships to take throughout the year.

Trans-Pacific shipping has greatly increased in the last few years, and in the near future it will be essential to safety that the steamship companies enter into an agreement making it mandatory upon the masters of vessels to follow definite routes, instead of going in any direction they wish as at present. To meet this condition, the Hydrographic Office has made a careful study of distance, storms, prevailing winds, fogs and ocean currents, and recommends the lanes for both directions between Puget Sound and Yokohama, San Francisco and Honolulu and Honolulu and Yokohama.

These steamship tracks are for all the year round. In the North Atlantic, where such routes have been followed for years, there is a shift during the iceberg season to a more southern route. The ships running between Puget Sound and Yokohama, however, do not have such dangerous ice conditions and one route can be followed all the year around.

The eastbound track from Yokohama to Puget Sound as laid down by the Hydrographic Office takes advantage of the Japanese current, while westbound ships are routed so as to strike the weaker inside edge of the current.

The recommended routes between the northern ports is the shortest practicable distance and runs south of the Aleutian Islands. The shortest actual distance would, of course, be along the great circle, but this leads through the Aleutian Islands and is impracticable on account of fogs, ice and treacherous currents.

EARTHQUAKES AND VOLCANOES

Science Service

MOST of the new islands of the Pacific that have arisen from the depths during the memory of man are volcanic in origin, and as no volcanic activity, so far as known, was associated with the recent earthquake in the Pacific, Professor W. J. Humphreys, in charge of seismology, U. S. Weather Bureau, at Washington, believes that there is little probability of new islands having been formed.

Contrary to the common belief, major movements of the earth's crust and volcanic eruptions are not related, although volcanoes and earthquakes often occur in the same region, though usually not at the same time. The two kinds of geologic activity occur in the same region because both are characteristics of relatively new portions of the earth.

A severe earthquake, such as the recent one, would be accompanied by a slip of only a few feet in the ocean floor, whereas a great volcanic eruption which would pile up hundreds of feet of material would probably be necessary for the formation of an island. But while earthquakes do not cause volcanic eruptions, volcanic eruptions may produce slight tremors in the earth in much the same way as boiling water makes a kettle vibrate.

THE "SHORT-CIRCUIT BEETLE"

U. S. Department of Agriculture Press Service

BEETLES which bore through lead cables, and which, nevertheless, do not or can not penetrate pure gum rubber, have proved a serious problem and pest in California and many other parts of the United States. One of the most important injuries inflicted by these beetles is the damage done to the lead sheathing of telephone cables in California. The beetles bore circular holes in the sheathing, about one tenth inch in diameter. Moisture enters the cable through these holes, causing a short-circuiting of the wires and interruption of service to the public. As one hole may put from fifty to six hundred or more telephones out of use for from one to ten days, the damage is rather extensive.

Experiments have been undertaken at various times, by the Bureau of Entomology of the United States Department of Agriculture, to determine what treatment could be used to keep the beetles from injuring the cables. These experiments are summarized in a professional paper, issued as Department Bulletin 1107, "The Lead-Cable Borer in California," by R. D. Hartman, H. E. Burke and T. E. Snyder, entomologists. Thus far the results indicate that the beetle is able to penetrate any lead alloy used as a cable sheathing or any poison or repellent placed on it. Probably it is able to penetrate the poisons because it does not feed as it bores through. Beef tallow, when sufficiently soft, will stick to the beetle and suffocate it, and has been used with some success on the rings which suspend the cable, since practically all the boring is done near the rings. Layers of friction tape impede the boring and thin sheets of copper, zinc and steel prevent it. Sleeves of these metals can be placed around the cable at the rings, but the cost would probably be too great for general use. A new type of ring made of flattened steel-wire stock galvanized is now being installed by the telephone companies, and it is believed that this ring is better from the standpoint of preventing attack by the beetle than the old one. Meantime, tallowing the rings is the most promising method of control.

COLOR OF PAINT IMPORTANT FACTOR IN FOULING SHIPS' BOTTOMS

The Fisheries Bulletin

SOME interesting results have been obtained by J. Paul Visscher in his study of the fouling of ships' bottoms. These results indicate that the color of the paint used is an important factor in determining the amount of fouling. A series of plates painted with different colors were exposed in sea water at the Beaufort laboratory, and the development of the growths was observed over a period of several months. The plates were identical except for the color used, and since all factors influencing them were the same it may be concluded that any difference in the amount or the nature of fouling was dependent on color. These colors included white, black, yellow, red, green and blue. The results show clearly that there was much more fouling on the dark plates than on those with lighter colors. The contrast between the white and black plates was especially marked. Barnacles, which constitute a large percentage of the total amount of fouling, were especially affected by color. They were found only on the blue and black plates and were most abundant on the black. Hydroids were also practically confined to the dark plates.

The results are apparently explained by the factor that, at the time of attachment of the larvæ to these forms, the organisms are negatively phototropic, that is, they tend to go away from the source of light. This experiment is in accord with observations made on the growth on ships' bottoms where the densest growths are found in regions least exposed to light. The notes and tentative conclusions are at present based on a limited amount of evidence, and it is expected that the problem will be more thoroughly investigated through experiments in which many of the less-known factors may be more definitely controlled.

SLEEPING SICKNESS

London Times

LAST night, at the Royal Society of Tropical Medicine and Hygiene, there were submitted two

papers of immediate practical importance on the treatment of African sleeping sickness. One of these dealt with the German synthetic drug known as "Bayer 205," which has now been employed by competent observers in this country in nine cases of sleeping sickness occurring in Europeans. Of these nine cases eight were infected with the organism known as *T. Gambiense*, one with that known as *T. Rhodesiense*. The latter patient died with active trypanosomes in his blood, in spite of having received many large doses of the drug. On the other hand, seven of the eight patients infected with *T. Gambiense* made what appear to be rapid and complete recoveries. Two have remained quite well for over a year without receiving further treatment. The eighth case died, but he was very far through when treatment with "Bayer 205" began, and after death the micro-organisms were found in his brain, to which area, probably, the drug is unable to penetrate. He died with brain symptoms.

The conclusion would appear to be that this German secret drug is indeed very potent in the treatment of at least one form of sleeping sickness. The second paper which was read last night deals with a preparation made in the Rockefeller Institute and called Tryparsamide. This drug seems to have given admirable results, and though it has been tested less widely than the Bayer preparation, it may well be that in process of time it will rival or excel it.

Thus, in a world distracted by schism, Science pursues the object of her great "international." She has no frontiers and recognizes none. Her sons and daughters build each on the foundations of the other, counting it the highest honor to be the servant of all. "So," perhaps, "shines a good deed in a naughty world."

GROWTH OF THE DESERTS

The London Times

WHATSOEVER be the cause, there seems to be a secular expansion of the desert belt, at least in the Northern Hemisphere. The rocky gorges of the Nile cataracts bear testimony to the passage of water on a scale much larger than any at present. The Sahara is scarred and seamed with old watercourses and the dry beds of lakes, and there is similar evidence from Arizona, New Mexico and Asia.

Colonel H. de H. Haig, in the current number of *Discovery*, reminds us that the deserts were the centers of past empires. The great nations of antiquity—Assyria, Babylonia, Persia, Phœnicia, the Hittites, Egypt and Carthage, the Aztecs and Incas—all flourished in lands now without sufficient rainfall, but which, with abundant water supply, would easily produce two crops annually.

The old caravan road from Tripoli to Lake Chad now passes through a waterless desert, but all along its length shows the remains of Roman stone buildings, wells, walls and paved roads. In Roman days North Africa was a vast granary, with numerous and wealthy cities, and an old Arab saying relates that it was once possible to walk from Mecca to Morocco in the shade. Mesopotamia was once the most fertile region on the earth, and its possession gave power and wealth to many great kings. Persia, now largely in the desert region, achieved wealth and civilization thousands of years ago, and was a conquering power at the dawn of Greek history. Sven Hedin and Sir Auriel Stein have reported the presence of extensive ruins, temples, shrines and mummies in the Gobi deserts of Central Asia, in regions that are now waterless. It seems a fair inference that the homes of old civilizations, so many and so great, could not then have been in their present desert condition.

Colonel Haig advances the theory that the world is actually drying up, more and more quantities of water being locked up in the depths of the earth as vegetation turned into minerals or by direct chemical combination. It is not possible to sink a deep shaft for a mine without encountering water, and he doubts if the bulk of such buried water is ever brought into active circulation again. This conclusion, however, is not inevitable. Even the deepest mine or boring penetrates only a small part of the total depth of the sedimentary rocks. The slow changes which elevate or depress the edges of continents, raise mountain chains, and sink rift valleys probably strike far deeper than the subterranean stores of water. The surface of the wide oceans gives an almost limitless field for evaporation. It is more probable that the present phase of growth of the northern desert band is only the slow swing of a long-period pendulum.

ITEMS

Science Service

THE more advanced Aztec and Inca tribes had acquired considerable knowledge of dyeing and other chemical operations long before the discovery of America by Columbus.

IRON was first made from iron ore in the American colonies at Jamestown in 1608.

MORE than forty different species of mosquitoes are known to occur in New Jersey.