SCIENCE NEWS

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CLAY LAYERS IN NEW JERSEY AND THE ICE SHEET

IN the Hackensack meadows of New Jersey there has been found a natural calendar record of the retreat of the last great ice sheet that covered America not less than 20,000 years ago. The clays that form the meadows tell a graphic story of the northward retreat of the ice.

Dr. Chester A. Reeds, of the American Museum of Natural History, will head an expedition to these meadows this summer to complete his study of the clays. For the last few years he has been collecting glacial clays from the Hackensack Valley and other points along the Hudson. He has analyzed and tabulated his findings to date. These findings plus the results of this summer's expedition will present in compressed form the geological history of this part of the country at the close of the last ice age.

The clay deposits tell their tale in this manner: With the gradual retreat of the ice fresh-water lakes formed in the lower portions of the enclosed basins in front of the glaciers. During the warm summer months of each year the ice melted and retreated a little to the north. With the melting process swollen rivers which flowed out from under the ice mass picked up fine sand and clay particles and carried them down to the lakes. These particles collected in the still waters of the lakes. The heavier particles of fine sand and coarse clay settled on the lake bottoms to form the sandy summer layer. The finer clay particles were held in suspension in the milky water throughout the summer. But with the coming of winter even the fine particles sank and covered the lake beds with a dark deposit of pure clay. By the next summer the water was clear again and the process repeated itself. Thus a sharp line has been drawn between summer and winter deposits. The summer deposits are sandy and light in color; the winter deposits, pure, dark clay.

By excavating the clay just as it stands and by the tedious process of counting the light and dark layers Dr. Reeds is able to trace the northward movement of the ice. Two deposits, a light summer layer and a dark winter one, equal a year. Dr. Reeds has already found in a forty-five-foot depth of clay a continuous series of layers representing 2,550 years for the deposition of material as the ice-front moved slowly northward up the Hackensack Valley. Deeper deposits are found to the south than to the north which shows that when the glacier still covered the northern part of the valley the southern end was gradually loosening from the grip of the ice. By comparing deposits throughout the length of the valley Dr. Reeds can trace the movement of the glacier through the years and the history of the return of a temperate climate.

THE ERUPTION OF KILAUEA

THE awakening of Kilauea, the Hawaiian volcano which after three years' quiescence is now again pouring out lava, is considered by volcanologists to be the first stage of a lengthy period during which the inner crater, Halemaumau, will gradually fill with the molten rock.

Experts do not look for a repetition of the great explosive eruption of 1924 when the crater of the inner "Pit of Everlasting Fire" was enlarged ten times. Another sort of eruption is now in progress.

Kilauea is one of the five great volcanoes which have joined in forming the Island of Hawaii. Besides Kilauea, Mauna Loa and Hualalai have been active in historic times. Kilauea consists of a low dome 4,040 feet high on the southeast side of the great dome of Mauna Loa, three times as high. On Kilauea's summit is a shallow crater, three miles long and two miles wide, and in the floor of the crater is the pit of Halemaumau, a hole about 3,500 feet across extending about 1,300 feet below the rim of the volcano. It is within this great fire pit that the lava has now reappeared.

It is estimated that there is now about 50 feet of lava in the inner pit and that it will take about a year for this great hole to fill. When filled, the lava will flow out upon the floor of the main crater.

Upon the very rim of this crater now showing renewed activity there is an observatory from which scientists keep constant watch upon the sleeping volcano. This unique institution is under the direction of Dr. Thomas A. Jaggar, who at present is in Alaska investigating volcanoes there and planning similar observatories for that territory. In his absence R. M. Wilson is in charge. Each week for the past few years a letter reporting Kilauea's condition has been issued to the scientists of the world.

Kilauea's present activity is being watched with interest by two Washington scientific organizations, the U. S. Geological Survey, under whose jurisdiction the Hawaiian Volcano Observatory falls, and the Geophysical Laboratory of the Carnegie Institution of Washington, which has conducted investigations of volcanic explosions throughout the world.

Dr. Arthur L. Day, director of the Geophysical Laboratory, has made personal investigations at Kilauea and is waiting further reports of the eruption, with interest, before determining whether further research will be undertaken.

In less scientific days there would be wide-spread attempts at the appeasement of the anger of Pele, the dreaded goddess of Kilauea. Even to-day native Hawaiians are reported to have made offerings to the volcano.

While much must still be learned about volcanoes, science now knows that they are local affairs, comparatively small test tubes for cosmic chemistry, and not outlets for a vast interior mass of liquid fire deep within the earth. It has also been discovered that the boiling lava is hotter at the top than it is in its depth.

INVESTIGATIONS OF INFLUENZA IN ENGLAND

THE recent influenza epidemic in England has been studied in the research laboratories. Scientists, frequently afflicted themselves, seized the opportunity to collect valuable information and took cultures from the noses and throats of each other, their assistants and their own families as they fell victims to the advance of the epidemic, in the hope of isolating the causative germ of the baffling disease.

Dr. G. S. Wilson, bacteriologist at the University of Manchester, attempted to isolate a bacterium that workers at the Rockefeller Institute for Medical Research in New York believe may be responsible for influenza. Cultures taken within 24 hours after a typical attack from patients who were on the laboratory staff failed, however, to yield up the suspected germ. Since the technique of the original investigators was carefully followed this may be taken to indicate that this particular organism is not the answer to the great influenza hunt that engages the attention of medicine at the present time.

Drs. David and Robert Thomson, of the research laboratory of St. Paul's Hospital, were able to get a blood culture within eight hours after one of them contracted a severe attack. The disease is so frequently complicated by secondary infections that the search for the causative organism of influenza itself involves prompt action as soon as possible after its presence is definitely ascertained.

The St. Paul research men were no more successful than the others in their search for the bacterium of the Rockefeller workers. They did isolate from the blood culture, however, a characteristic streptococcus, the type of bacterium that grows in bead-like chains, that they were able to find in several other patients. When the original influenza victim had a subsequent mild attack the streptococcus was located in cultures taken from the mouth. They do not claim that this is actually the long-sought-for organism, but they do point out that it will bear looking into by other research workers engaged in this vital problem.

INDIAN MOUND OF OHIO

A LARGE Indian mound near Bainbridge, Ohio, is being sliced like a loaf of bread by exploring archeologists who have found thirty Indian burials and a complicated internal structure.

What appears to be an elongate earthen pyramid is buried under the external surface of the so-called Seip mound. Seen from the outside the mound looked merely like a great rounded heap of earth, 240 feet long, 150 feet wide and 30 feet high.

The basis of the mound is a lower mound, shorter and narrower than the covering structure, rounded on top and covered with a layer of gravel. Presumably this lower mound was for ceremonial purposes for under it are found the Indian burials. Covering this inner mound is a mass of earth with steeply sloping sides, like the roof of a house or a long pyramid, and over this in turn there is another mass of earth, noticeably different from the "pyramid" in color and texture, which gives the outer mound its final rounded shape. Over this again is a layer of river gravel, thin at the top and thicker at the sides and held in place at the bottom by a wall of large stone slabs. All this great hill of earth was toilsomely built many centuries ago, by Indians whose only way of carrying it was in baskets on their backs or heads.

The peculiar and puzzling structure of this mound has been disclosed only by the methodical system pursued in opening it. The work is being done under the direction of Dr. H. C. Shetrone, of the Ohio State Archeological and Historical Society. He has a gang of workmen and dirt-handling machinery at his disposal, in addition to a group of research students to do the more exact work. Every cubic foot of earth in the mound is being moved. He is cutting off the mound slice by slice, examining everything he finds as he goes. Before snow flies he expects to cut his last slice. Then he will put the mound back into as nearly its original form as practicable.

To date, he has sliced off a little more than half the mound, and has uncovered about thirty Indian burials. Almost all of them are just above ground level, under the inner mound. A few are three or four feet higher. These latter were important chiefs, judging by the burial gifts found with them, which included great strings of river-mussel pearls in addition to the usual stone, bone and pottery offerings, and ornaments and weapons of copper.

WOOD PRESERVATION

PRESERVATIVES against decay are injected into wooden poles with an apparatus like a hypodermic needle on a huge scale, by a recently patented German process. Rows of holes are made all around the pole in the zone exposed to rotting, and appropriate chemicals in paste form forced into them through hollow tubes. The preservatives then spread along the grain of the wood, the area around each injection overlapping that around its neighbors and forming a complete protective sheath.

The inventor claims several advantages for his process. Inasmuch as the apparatus is compact and easily portable, poles can be treated where they are to be set, instead of having to be assembled at permanently located treating tanks and then shipped out again. One or two men can do all the work, instead of the larger gangs now needed. Untreated posts already erected can be treated without pulling them up and resetting them.

A saving in material is also claimed. The creosoting processes now used treat either the whole pole, or at least the whole underground part of it, to the same depth. This is said to be unnecessary, because the maximum decay takes place at the ground level and for a couple of feet below it, the butt of the pole being usually little more rotted than the top. By the new process, it is possible to give the rapidly-decaying zone a heavy dose of the preservative, and then give the rest of the pole a lighter treatment.

MICROPHONES FOR THE PROTECTION OF BANK VAULTS

ALREADY learned in the ways of policemen, night watchmen and the miles of wire incidental to the usual electric alarm system, the bank robber may now find himself up

against a new signal device invisible from the outside yet capable of calling a squad of armed guards upon him as he works, which has been devised by the engineers of the Bell Telephone Laboratories. In fact, the safe-blower now works under war-time conditions, for the new alarm is founded on the Type H inertia microphone developed in the laboratories during the war for submarine detection.

This alarm consists of a microphone capable of detecting the most minute vibrations of the walls of a safe. It has already been installed in several banks in New York City and in Philadelphia. The microphone will not pick up sound waves. The stimulus is received mechanically rather than acoustically. But the slightest jar will be sufficient to set in motion an electric current to the main office where both audible and visible signals will be received.

Such devices have been conceived before. But heretofore they have transmitted vibrations and even sounds from outside. Thus guards have been summoned when merely a heavy truck was rumbling by or when street conversations grew sufficiently loud.

The newly developed microphone, however, is not affected by disturbances outside the vault. At one of the banks in which it is installed subway trains rumble constantly within a few feet of the vault and no false alarm is sent out. But let a careless cleaner so much as knock the handle of his broom against the vault door or walls and armed guards will come to investigate. As for cracksmen, even the acetylene torch is without avail. It causes a sputtering of the molten metal strong enough to shake the wall slightly.

Further, the microphone takes up infinitely less space than the wire signal system. It is small and several microphones effectively placed will be sufficient to protect the largest room. In contrast to this compactness, eighteen miles of wire were recently used in installing the old alarm system in the vault of a prominent New York bank.

ITEMS

BARLEY has been grown by the human race longer than wheat, so far as evidence now in hand indicates. In the *Journal of Heredity*, Dr. O. F. Cook, of the U. S. Department of Agriculture, discusses the researches of an English scientist, Professor G. Elliott Smith, who has been examining the remains of grains found associated with the mummies of the most ancient times in Egypt—frequently inside them. In these oldest mummies, the grain is always barley, never wheat, whence the conclusion is drawn that the Egyptians knew barley long before they cultivated the latter grain.

RADIO waves will never make two blades of barley grow where one grew before, according to plant physiologists of the U. S. Department of Agriculture, in reply to statements ascribed in a recent news item to Admiral W. H. G. Bullard, chairman of the Federal Radio Commission. Admiral Bullard was quoted as saying that barley planted under the radio towers at Arlington grew so high that it overtopped men walking through it, due to the influence of the radio waves. Many researches have been conducted in electriculture to determine this very point and the results have always been either inconclusive or distinctly negative. The Arlington barley, it is pointed out, had no "control." That is, there was no other plot of barley planted on exactly similar soil but removed from the possible influence of the waves. Without such "controls" no biological experiment has any value whatever. In the experiments of the plant physiologists there were always "control" plants, which showed little or no difference from the ones exposed to the electrical waves.

MANGANESE deficiency, a disease afflicting plants that grow in certain types of soils, can be cured by hypodermic injections with a solution of this necessary mineral, as well as by the more usual method of supplying fertilizers containing it. Dr. Forman T. McLean, of the Rhode Island Agricultural Experiment Station, recently told a Science Service representative of his experiments. He raised a number of plants on soil with all the natural manganese removed, and when they began to show the characteristic symptoms of manganese starvation he injected into their leaves a very weak solution of a salt containing it. The sick plants very promptly recovered.

A NEW method of making airplanes safe for passenger traffic has been devised by a German inventor, Dr. Roland Eisenlohr. It is an improvement on an American plan to attach a large parachute to the entire airplane, with provision for opening it in case of accident, and letting the whole machine gently down to earth. Because of the large amount of dead weight, in engine, fuel tanks, wings, etc., the American invention requires a relatively enormous parachute. To eliminate as much of this as possible, Dr. Eisenlohr proposes to place passengers and pilots in a separable cabin, to which the parachute will be attached. Then, in case of accident, the mechanical parts of the plane are permitted to fall away, while only the cabin makes the slower, safe descent. This scheme would be of especial value in case of fire, for it would instantly get rid of the flaming fuel tanks.

EXPERIMENTS will soon be made in England on the velocity of sound when firing of big guns will be broadcast by radio from the artillery proving grounds at Shoeburyness. People for miles around will have the opportunity of hearing the guns by radio, and then, several minutes later, of hearing the actual sounds as they travel through the air. This announcement is made by Dr. F. J. W. Whipple, of the Kew Observatory, in *Nature*. He says that at Grantham, about 80 miles from Shoeburyness, he has heard the firing of the guns between 10¾ and 11¼ minutes after they were discharged. Such abnormal distances for sound seem to be the result of an effect something like that of the Heaviside layer which reflects radio waves down to earth again instead of letting them go out into space. Dr. Whipple says that it is agreed that such long range sound records are the result of a layer of the air some 25 miles or more above the earth's surface, where the temperature is relatively high, and the sound waves are refracted down to earth again. Thus a sound that might be inaudible at 20 miles' distance might be heard at a hundred.