

SCIENCE NEWS

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OCEAN CANYONS

THE depths of the ocean will be explored if a great cooperative plan just proposed by the International and Geodetic and Geophysical Union takes its expected practical turn. Scientists of 25 nations, meeting at Prague, have passed resolutions recommending an international cooperative study of "ocean deeps," according to the U. S. Coast and Geodetic Survey.

"Ocean deeps," or "ocean canyons," are known to scientists as "the earth's last frontier," because man has not, until recently, devised instruments which to any degree of accuracy could measure their vastness. Even a visualization of the Grand Canyon of the Colorado dwindles into insignificance when compared with the gigantic size of the ocean canyons. The Grand Canyon stretches one mile deep and some 10 miles wide, while the "deeps" at times are at least three miles below the ocean's so-called bottom and a score or so miles in breadth.

Among the best known "ocean canyons" are: one on the west coast of Mexico, stretching some 40 miles wide and an indeterminate distance in length; one off the Aleutian Islands of southeastern Alaska; one off the coast of Java, recently explored to some extent by the Dutch Government, and others off the coasts of Japan and the Philippines.

Scientific men have labored under handicaps in their efforts to explore the ocean substrata. It has been impossible to send submarines into the treacherous watery depths because the pressure would crush the craft's heavy metal as rapidly, perhaps, as an egg-shell crumbles in the hand. The usual procedure has been to make soundings by means of leads attached to heavy piano wire. However, to let out some six miles of wire and pull it to the surface again has proved to be a task, taking ordinarily at least an hour's time. Moreover, hundreds of soundings must be taken in this laborious fashion in a limited area before scientists may gain anything approximating a genuine idea of the "deep's" configuration.

Fortunately, a sounding device developed recently has given promise that knowledge of these "deeps" soon will be more than a scientific dream. The contrivance is now being used by the U. S. Coast and Geodetic Survey in its work. It operates on the "echo principle," based on the rate of speed at which sound travels. The rate being known, the machine makes it possible to compute the depth. Thus thousands of soundings may be taken in a comparatively short time—and while the ship is moving ahead at full speed. In conjunction with this method the old method still is used, primarily, however, for the purpose of bringing up specimens of the ocean's bottom, revealing the character of the crustal material.

Scientists believe an extensive international cooperative study of "ocean canyons" might reveal important facts about earthquakes, three fourths of which have their origin in the sea. In this respect, a particularly fertile

source is the Pacific Ocean, notably off the coast of earthquake-swept Japan. There is the possibility, moreover, that some undersea volcanoes, unknown as yet to science, may be brought to light. Again, while no definite attempt is planned for the study of undersea fauna and flora, facts of great value to oceanographers may be disclosed.

"NEBULIUM"

NEBULIUM, the strange "element" that has been supposed to exist in such bodies as the great cloud of glowing gas in the star group of Orion, seems to be nothing but oxygen and nitrogen, of which we take in about a pint every time we breathe. This is the opinion of I. S. Bowen, of the Norman Bridge Laboratory of Physics.

Following the discovery of helium, first as a strange line in the spectrum of the sun, and then as an actual element on the earth, a mysterious group of lines was found in the spectrum of some of the nebulae. As most of the spectral lines are known to be due to certain elements, it was thought that the strange lines, of which one was green, might be due to an element as yet undiscovered.

Dr. Bowen's studies now indicate, however, that these lines are due at least partly to oxygen and nitrogen, of which the air is chiefly composed, but in what is termed the "metastable state." While in the laboratory atoms of certain gases can be induced to enter this state, they ordinarily return to the normal condition without giving off light, by bumping into another atom or the walls of the tube. In the nebula, however, the pressure is very low, probably much lower than the lowest terrestrial vacuum, which means that the atoms are not so crowded. They are therefore less apt to bump into each other, and the walls of the tube are absent. The result is that the atoms remain longer in the metastable state and finally return to normal condition spontaneously. According to Dr. Bowen's calculations, if this happened, light would be given off of the same wave-lengths as the mysterious nebulium lines.

Dr. Bowen reported his conclusions recently to *Nature*. In a later issue, Professor A. Fowler, a leading English authority on the subject, states that the evidence, on the whole, "appears to be in favor of Mr. Bowen's suggestions." He also suggests that one of the lines, in the part of the spectrum just beyond the red end, should be accompanied by a fainter line, on the side towards the visible spectrum. If astronomers can discover this in the spectrum photographs of the nebulae, it would be strong evidence in favor of Dr. Bowen's views.

YELLOW FEVER IN AFRICA

DR. HIDEYO NOGUCHI, the well-known bacteriologist of the Rockefeller Institute for Medical Research, is *en route* for Lagos, Nigeria, to investigate the yellow fever that has been prevalent on the west coast of Africa for several months.

Dr. Noguchi will work in collaboration with the staff of the International Health Division of the Rockefeller Foundation at Lagos, which has been working on the African yellow fever problem for some time. It is due to the efforts of the International Health Board that this once widely-distributed disease has been almost entirely eliminated in the western hemisphere except for isolated cases in the interior of Brazil and other countries of South America. Every effort is being made to stamp out the fatal insect-borne malady before it gains a wider foothold in Africa or can spread to the Orient.

Dr. Noguchi already has to his credit a preventive vaccine and a curative serum for yellow fever developed in the laboratories of the Rockefeller Institute several years ago. According to reports received by the French Academy of Medicine, this treatment was used with considerable success in an outbreak in Senegal during the past summer.

On account of the lack of transportation and other difficulties in the way of carrying out a scientific program of disease control in a primitive tropical country, the work of the International Health Board has been confined to the British colonies of Nigeria and the Gold Coast. Scientists hope these researches will lead to new light on this highly fatal disease that will eventually bring about its eradication from the face of the globe.

On his return trip, Dr. Noguchi expects to visit Egypt to study trachoma, a disease of the eye, widely prevalent there. What is believed to be the causative organism of this eye infection was recently isolated by Dr. Noguchi from the eye of an American Indian, a race in which trachoma is commonly found in this country.

HANDICAPS OF FIRST-BORN CHILDREN

TIME was when being your parent's first-born child, if you were a boy, was an immense asset from a worldly point of view. Now comes Dr. G. F. Still, professor of children's diseases at King's College, with a statistical study that shows that the first birth, more than any subsequent ones, carries with it a definite physiological risk of congenital malformations of the mind or body.

The most prominent defect he has found associated with first-born children is known technically as hypertrophy of the pylorus, too large a development of the muscle that controls the departure of digesting food from the stomach into the intestine. The proportion of first children among 400 cases afflicted with this trouble runs as high as 48.5 per cent. Dr. Still also mentions pneumonia and congenital heart disease as claiming a large number of victims among those who came first in the family.

Place-in-family as a factor in the causation of disease is thought to be due to certain affections that come from perversion of development during the prenatal period with the first child.

The practical applications of this research are pointed out by Dr. Still, who states: "It is no small thing if we can give comfort and hope to the mother and father who are faced with disaster in their first-born, in the shape of some congenital abnormality of mind or body. They are apt to imagine that this is due to some fault

or failing which will mar the rest of their married life by likelihood of repetition of disaster if they have further children. It is something to be able to tell them that primogeniture itself is a large factor, possibly the only factor in the production of their misfortune, and that it is therefore highly improbable that any subsequent child will suffer from any congenital anomaly, as indeed experience shows, for the repetition of congenital anomalies in a family, though by no means unknown, is very exceptional."

THE NEANDERTHAL MAN

THAT Neanderthal man was a direct ancestor of modern man, and not merely a side shoot from the evolutionary stem, is held out as a definite scientific possibility by Dr. Aleš Hrdlička, the American anthropologist. Speaking on the occasion of the award to him of the Huxley Memorial Medal of the Royal Anthropological Society on November 9, Dr. Hrdlička called in question the widely accepted belief that this ancient, low-browed race was a people apart from modern humanity, and was entirely exterminated by an invasion of the early Cro-Magnon race, leaving no descendants.

While emphasizing the necessity for much further excavations and search for materials to supplement the present collections of skulls, bones and implements, Dr. Hrdlička indicated that even the fragmentary data now in hand suffice to cast considerable doubt on present widely accepted theories.

In geological sequence, in his relation to the animals among which he lived and which supplied his food, in his choice and use of shelters and caves, in his art and implements, and above all in his bodily structure, Neanderthal man fits into the evolutionary picture. In his beginnings, he grades off into the little-known races that preceded him, and at his end he grades off similarly into the better-known race that followed.

Even in the crucial matter of skull shape and proportion, Dr. Hrdlička pointed out, Neanderthal man is not so sharply marked off from modern man as we commonly assume. The more typical skulls do display marked characteristics, such as a low, flattened top of the braincase, heavy eyebrow ridges reminiscent of the gorilla, a jaw very massive but lacking in chin, and a very primitive type of teeth. But among the collection can be found skulls that depart from the type. One shows a higher cranial arch, another has eyebrow ridges of a less ape-like type, a third displays a remarkably "human" tendency in the shape of the upper jaw and palate, and so on. These departures from type, Dr. Hrdlička said, indicate that evolution was actively at work in the race, and that it was not a fixed and static type which could not give rise to a new kind of humanity. It would be more proper, in his opinion, to refer to a Neanderthal phase in human development rather than to a Neanderthal species of man.

ANCIENT INHABITANTS OF AMERICA

A LITTLE flint arrow point, such as primitive men used in hunting game, has been accepted by a number of scientists as real evidence that America was inhabited when

mammoths and mastodons roamed this country, in the Pleistocene period, at least 15,000 or 20,000 years ago. The arrow point was discovered beside a buffalo skeleton at Folsom, New Mexico, about two months ago, and it has remained untouched while experts on American Indians and experts on geology have visited the scene to express their opinions as to what story it really tells.

This is the first time that a tool used by man has been found beside a prehistoric animal and has remained undisturbed for careful scientific examination, according to Dr. F. H. H. Roberts, Jr., of the Bureau of American Ethnology, who has just returned from investigation of the remarkable discovery.

"It has been said that prairie dogs burrowing into the ground can push an object into old, deep layers of earth, where much older objects lie," said Dr. Roberts. "But in this case there are four distinct layers over the bones of the buffalo and the arrow. There are no prairie dog holes in the vicinity, and the layers are entirely untouched.

"The arrow lies close to a rib bone of the buffalo, in such a way as to indicate that it was in the animal at the time of death."

Four other arrow points were also found and bones of eight buffaloes were counted altogether in the pit, but some of this other material was moved in early scientific study of the site. The buffaloes were apparently caught in a bog while being pursued and sunk there to die.

The arrow points are beautifully chipped, Dr. Roberts reports. A unique feature is a hollow groove down the center of each flint. In the recent war, bayonets were grooved to cause greater bleeding, and it may be that the Stone Age Americans had this same idea.

The first discovery of prehistoric animals at this site was made two years ago by a cattle inspector who was passing the ravine and saw bones sticking out of the bank. He recognized them as buffalo bones and sent specimens to J. D. Figgins at the Museum of Natural History, in Denver. Since then, Mr. Figgins and his assistants have made further discoveries and the site is still considered likely to yield further evidence of the same sort.

"There is no question that the arrow and the buffalo most recently found there came there together," Dr. Roberts concludes. "It remains for the geologists to determine the age of the deposits in which they occur."

Dr. O. P. Hay, paleontologist of the U. S. National Museum, who visited Folsom this summer and has examined some of the prehistoric buffalo bones found there, considers this discovery "one of the most certain pieces of evidence produced that man existed in America in the Pleistocene period." From this and other similar finds Dr. Hay says that it seems impossible to believe that man has been in America only a few thousand years.

The buffalo bones are those of an extinct species, somewhat larger than modern buffaloes, and they may turn out to be a kind different from any heretofore known.

ITEMS

A SCIENTIFIC method of crossing a bridge before you come to it is described by Dr. L. O. Howard, head of the

bureau of entomology of the U. S. Department of Agriculture. During his recent trip in Europe, he found in Germany a new and well-equipped laboratory for the study and combat of the European corn borer, which is working costly havoc on the eastern border of the American corn belt. Dr. Howard knew that corn has never been raised in Germany to any extent, and the laboratory seemed to be a sheer case of borrowing trouble. He asked the German scientist who was acting as his guide about it. "No, we do not have much corn as yet," was the answer; "but you see we are about to begin cultivating it on a large scale in this country. Of course, when we do we shall have to contend with the corn borer, and we think it is well to get a head start while we can."

X-RAYS applied to the reproductive cells of plants in the laboratories of the University of California have resulted in the production of many new varieties and in the visible modification of the cell structures responsible for the transmission of hereditary characters in reproduction. The work was done by Professor T. H. Goodspeed, of the department of botany, and Professor A. R. Olson, of the department of chemistry, using tobacco plants as material. Their results resemble and partly corroborate those recently reported for fruit-flies by Professor H. J. Muller, of the University of Texas. Nearly 1,200 offspring of X-rayed parent plants are now growing in the university's new botanic garden.

THE vexed question whether Neanderthal man appeared in Britain before or after the glacial period is now considered settled in favor of the earlier date, according to J. Reid Moire. Mr. Moire is chairman of a committee of scientists appointed to examine the clay beds at Hoxne, Suffolk, which have yielded large numbers of implements made by Neanderthal man. The structure of the beds, as pieced together from many excavations, shows a thick layer of glacial boulder clay, indicating a long period of intense cold, above the stratum in which the most primitive man-made implements of this locality are found. Overlying this glacial layer was a second bed containing stone tools of the Old Stone Age, but of a more advanced type than the first. Then another deposit of the type laid down during cold times, and finally the present ground surface, beneath which were found relics of the New Stone Age. The intervention of two cold-period beds above the level of the earliest implements is regarded as conclusive evidence of glacial man in Britain.

THERE appears to be no lower limit to the descending birth rate of European cities short of absolute zero, according to studies made by Dr. Warren S. Thompson, of the Scripps Foundation for Population Problems. Berlin leads the procession with only 11.7 births per thousand people in 1925 which exceeded only slightly the death rate of 11.4, but the figures available for 1926 indicate that the death rate may have exceeded the birth rate during the last year. As a group the large cities of Germany had a birth rate of only 14.1 in 1926 and the report for the first month of 1927 indicates that for this year it will be even lower.