SCIENCE NEWS

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EXPLORATIONS IN MID-SAHARA

FIFTEEN stone implements, representing one of the oldest of Old Stone Age cultures, found in the midst of the vast emptiness of the Sahara, with no trace of human or animal bones and no sign of the fire-hearth of the ancient camping place—these are the first fruits of our hunt for remains of prehistoric man in the greatest of the world's deserts.

At a spot four miles northeast of Aoulef, we have spent three days excavating an area fifty yards in diameter in the midst of a desert plain between distant remnants of an ancient plateau. According to Professor Gauder, of the University of Algiers, the plain is of Quaternary formation, representing the last geologic period before the coming of the great ice age. At a depth of from two inches to a foot the expedition found a curious sandstone formation with projections like stalagmites, as though a cave had once been there. At a depth of from four to eight inches of sandy clay overlying sandstone, in an absolutely undisturbed deposit, we found fifteen lower Paleolithic implements. The first was a hatchet in the course of workmanship, covered with a crust of sandstone. We found other stone material, all of which has the characteristic shape and technique of the Chellean culture. The men of the Chellean age were of the low-browed Neanderthal race, co-eval with the mammoth and the cave-bear. They knew the use of fire and made chipped flint implements, but had not yet learned to fit these with wooden shafts to make spears and axes.

Soundings and systematic excavations were made elsewhere in the neighborhood, but these implements were all found in a small area ten yards in diameter. There was absolutely no indication of animal remains nor any hearth sites. The place was discovered by Governor Maurice Reygasse purely by chance.

The nearest water was at a depth of thirty feet, irrigating tunnels passing at a distance of one hundred yards from our diggings. The débris in these tunnels does not show any materials similar to our finds.

This discovery constitutes the only lower Paleolithic discovery known in the Sahara. Other stations of later epochs were noted on the surface at a distance, but are as yet unstudied.

The weather is sunny and bright, but wintry. Our arrival at Aoulef Cheurf came at the end of four days' camel-ride across the cold desert. When we reached the place we found that news of our coming had anticipated us, and we were received with all due ceremony by a committee of natives and prominent citizens. They had even turned out a native band in our honor—six drums and one flute. It was a weird noise, but it was the best they had, and we received the salute in the spirit in which it was given.—*Alonzo W. Pond.*

THE MIGRATIONS OF PREHISTORIC MAN

ANTHROPOLOGISTS in America and Europe are interested in data that the Beloit-Sahara expedition under Alonzo W. Pond may supply to fill in an important gap in the map of the migrations of prehistoric man. The results achieved by the Franco-American expedition, in which Dr. Pond participated, together with the preliminary work done in past years by M. Maurice Reygasse, French governor of Tebessa, are looked upon as reasons to hope that the trail of early man, which is now reasonably complete on the northern side of the Mediterranean, may soon be equally complete along its southern shore.

The map of man's migrations has grown in a most remarkable manner during the present year. At the beginning of 1925, the only well-authenticated human remains of the Neanderthal and Cro-Magnon types were those which had been made in southwestern and central Europe. But early last spring a Russian scientist named Bontisch-Osmolovsky discovered in a cave in Crimea parts of two Neanderthaloid skeletons, together with stone implements and bones of prehistoric animals. Then the Mongolian expedition of the American Museum, under Roy Chapman Andrews, reported the discovery in interior Asia of records of the "dune dwellers," who were also men of Neanderthal type. These two discoveries vastly enlarged the known range of this ancient human race, and set the probable center of dispersal well to the east.

A key discovery was made near Capernaum, in Palestine, famed for its Biblical associations, when Francis Turville-Petre, an English paleontologist, found the skull of a Neanderthal man of a peculiar and apparently advanced type. This suggested that the route that took the descendants of Abraham from Asia through Palestine and eventually into Egypt had been traveled long before by this primitive race. Stone age remains of all dates have long been known abundantly from the Nile region. The puzzling skull from Rhodesia, in southern Africa, has some Neanderthaloid features, and may represent a third distinct migration that branched off toward the south.

The question now stands: did the Neanderthal and Cro-Magnon races migrate across northern Africa, at a time when what is now the liteless Sahara supported grassy plains and possibly forests? And did they, upon reaching the Atlantic, complete the circuit of the Mediterranean and cross over into Europe? The "Gibraltar woman" was of the Neanderthal type, and some of the other skulls discovered in the more southerly of the European stations are distinctly negroid. Did the earliest "course of empire" take its way westward in two streams, that reunited at the end of the journey? Scientists are waiting for the answers that are hidden in the sands of the Sahara.

REVERSIBLE PHYSICAL PROCESSES

IN the course of the Silliman Lectures which Professor Gilbert N. Lewis, of the University of California, has been giving at Yale University, he showed that the acceptance of the Einstein theory of relativity abolished the idea of the older physics that the universe is running

down like a clock. According to views hitherto held it seemed that all forms of energy tended to become dissipated and eventually diffused throughout space, and this pointed inevitably to a period in the far future when the universe would come to a stand-still forever. Any physical system left to itself would in the long run arrive at this state of run-downness, the degree of which scientists call entropy. .

But Professor Lewis pointed out that according to the new geometry of the relativity theory this would not hold true, for the chance that the system would again return to its original state of high potential energy without any outside interference could be calculated, and that this event would necessarily ultimately take place. Thus all phenomena of the physical world are reversible in space-time. Past and future are therefore alike and there is no one-way drift of the universe as a whole.

But in our consciousness time appears to flow in one direction. Our vital processes are irreversible. Life proceeds in one direction from birth to death. Vital phenomena, therefore, do not come under the domain of the physical laws. All irreversible processes result from living things which are cheats in the game being played by physics and chemistry.

Professor Lewis's lecture is regarded as a blow to the mechanism theory which prevailed during the past century and is somewhat in line with the "Creative Evolution" of Henri Bergson.

THE COLLECTION OF REPTILES AT THE UNIVERSITY OF CHICAGO

A CHOICE collection of the brains of an important group of reptiles which flourished in various parts of the world about ten million years ago, and of which the only living representatives are in New Zealand, has been brought to the University of Chicago by Dr. John Cairney, of the University of Otago. He will collaborate with Dr. C. J. Herrick, of the department of anatomy, in making a complete study of the peculiar cranial apparatus.

This lizard, known to the native New Zealanders as the tuatara, and to scientists as Sphenodon, is a stockily built reptile about a foot and a half long. Dr. Herrick states that it is threatened with extinction, a fate which has overtaken some of the flightless birds of New Zealand within historic time. At present its habitat is on some of the smaller outlying islands, where it is being sedulously protected by the government.

The skeleton of the tuatara shows an ancient and primitive pattern which disappeared from the earth millions of years ago except in New Zealand. Why has this pattern survived there? Is it simply because of the absence of dangerous enemies? Or has the creature developed a brain pattern which has outdistanced his old-fashioned body and so enabled him to keep his place in the sun? These are questions Dr. Herrick asks.

"It is too early to predict the results of the examination," said Dr. Herrick. "But clearly the tuatara is not a moron among the lizards. His brains are first class in every respect, and they are very different from those of all other lizards. They are evidently modern brains and no mere survivals of the era of a Lost World marooned on the strand of a desert isle."

THE JAPANESE BEETLE IN NEW HAVEN

MONOPOLY of an undesirable oriental immigrant is the undesired distinction now held by New Haven, a distinction which the city is determined to get rid of at the first opportunity. The immigrant is a little beetle from the orient, an insect related to the Japanese beetle that has wrought havoc among the truck farms of New Jersey and Pennsylvania, and also to the common native American May-beetle. It is, however, considerably smaller than the Japanese beetle and very much smaller than the May-beetle, so that its adult form is not easily detected by the casual searcher.

Several years ago residents of New Haven noticed distressing bare patches in their lawns where the grass was being killed by an unknown enemy. Dr. W. E. Britton, state entomologist of Connecticut, investigated the condition and found that the roots were being eaten by the larvae or grubs; for the new enemy spends its early life underground just as the May-beetle does. The adults, Dr. Britton states, feed very little or not at all, living apparently on stored-up reserves accumulated during grub-hood. But the voracious appetites of the grubs make up for the abstemious habits of the adult beetles, and ever-widening patches of dead grass have annoyed the householders of New Haven.

So far as is known, the pest is confined entirely to one area in the residence section of New Haven, and almost entirely to the lawns. One strawberry patch has been ruined, but that is all the damage reported to gardens. If the insect were to spread its range, it might become another major pest; but fortunately it has shown little disposition to wander. This may possibly be due to the fact that although it has wings it appears to do little flying.

During the past summer its depredations have become serious enough to arouse a campaign against it, and heroic measures will be taken this winter to wipe out the colony.

SURGICAL TREATMENT OF TUBERCULOSIS

A SURGICAL method of giving unfortunate tubercular lungs the rest cure is described by Professor John Alexander, of the University of Michigan, in the December issue of the *Journal of the Outdoor Life*, as the means of curing or improving a large percentage of patients suffering from progressive tuberculosis in one lung.

The "rib operation," as this method is called, is the most important surgical means of treating tuberculosis. It was first used in a crude form by a French surgeon of Lausanne, Switzerland, and was greatly improved later in Germany. It has passed the experimental stage and has been used by European surgeons with a remarkable degree of success.

It consists in removing from one to eight inches of the eleven upper ribs where these are joined to the spinal cord. The pleural cavity is not opened and the lung is not touched. The gaps left by the removal of portions of the ribs are filled when the remaining ends come to-

gether, and the size of the chest is reduced on the operated side, compressing the lung and its cavities.

Within a few months the cut ends of the ribs grow together and bony bridges form between them. The lung loses its power to function and has a chance to eliminate in time the diseased portions. Experience has shown that one healthy lung is enough for the normal respiratory needs of any person.

After the tuberculosis is healed the lung can not be restored. This is not a disadvantage, because the weak lung is held under permanent control against the dangers to which it would be exposed when the patient returns to active life.

After the wound is healed the deformity is very slight. Although the lung is greatly diminished in size the circumference of the chest does not appear much smaller because the collar bone holds the shoulder at its normal distance from the body. The range of motion and the strength of the shoulder and arm on the operated side are very little impaired.

STATISTICS OF MARRIAGE AND DIVORCE

ALTHOUGH the number of divorces in the United States has increased once more and the number of marriages is actually dwindling, according to the U. S. Census Bureau, that is not a sign that the country is fast going to the dogs.

The reason, in the opinion of Dr. Victor C. Vaughan, chairman of the division of medical sciences of the National Research Council, that there are more divorces now is because women are able to support themselves in comfort and peace, and because there are fewer children to hold drifting couples together.

In spite of flappers and jazz, easy divorce and bootlegging, the morality of the country is no worse to-day than it was in the good old days when he was a boy, Dr. Vaughan said. Instead of marrying at all costs, and as soon as possible, a girl to-day does not marry unless she wants to. It is easy enough for her to get a job, and have silk stockings and earrings all her own. The very helpless damsel is passing like the spinning wheel and the highboy.

The figures of the Census Bureau show that in spite of the natural population increase of nearly one and a half million from 1923 to 1924, the number of marriages in that time dropped from 1,223,924 to 1,178,206, or 3.7 per cent., while the number of divorces grew from 165,096 to 170,867.

In 1923 there were 10 divorces for every 74 marriages, but in 1924, the same number of couples got divorced for every 69 marriages. Texas, the biggest state, had the biggest divorce list, and Illinois and Ohio followed after. New York had the most marriages, and Illinois, Pennsylvania and Texas were next.

Divorces in states do not indicate social trends as a rule, but are generally dependent on the nature of the local divorce laws.

ITEMS

AS a replacement for imported black coal the Swedes are this year burning more of their native "white" variety, that is, electricity produced by water power, and remarkable results in fuel saving have also been achieved by an experimental control of coal consumption in 749 institutions owned by the government, as a part of a national campaign to make the country less dependent on foreign raw materials. While practically without either coal mines or oil wells, Sweden has been favored by nature with an ample supply of water power, estimated in a recent governmental report at 42,600,000 kilowatts per year, of which only a small part has been utilized. And yet the country has about 2,400 electric power stations, of which the government owns the largest. At the present moment a single transmission line, that from Trollhattan on the west coast to Vesteras, sends enough electricity to the central Swedish industries to save 500 tons of coal a day. Soft coal costs $12.80 a ton. The check on coal consumption in the government institutions was begun in 1921 and by better firing methods and the use of more suitable grades of fuel, the savings averaged 15.5 per cent. for three years, representing a net reduction in outlay of over $536,000.

THE first sample of synthetic gold which has reached this country is to be an exhibit in the collection of elements at the American Museum of Natural History in New York. Dr. George F. Kunz, the well-known gem expert, who has the difficult task of gathering together samples of as many of the ninety-two elements as can be obtained or exhibited, states that the sample of what is said to be synthetic gold is a tiny speck. It is a product from the laboratory of Professor Hantaro Nagaoka, of the Tokyo Imperial University, who obtained microscopic quantities of what he reports to be artificial gold from mercury by running a mercury lamp over a long period and employing extremely high voltage. Dr. Kunz has in his collection the first crystals of pure fluoride of hafnium and metallic hafnium. He has not yet obtained samples of the twe new elements, rhenium and masurium.

"THE Ancient Mariner never would have thirsted for water if that old sailor could have taken a film of water about .00000004 centimeters thick from the surface of the ocean," according to Professor W. D. Harkins, chemist of the University of Chicago. Any solution of salt water, he explains, has a thin film of pure water surrounding it. The volume of the solution may vary from a drop to an ocean, but the film is always present. The amount of salt dissolved in a given amount of water determines the thickness of the film. A dilute solution of table salt has a film of pure water about .00000004 centimeters thick around it; a concentrated solution has a film .000000024 centimeters thick. The film becomes thinner as the amount of salt increases. The thickness of the water film in the concentrated solutions is almost identical with the thickness of a salt molecule, .000000035. "All physical matter, from a shark's tooth to a dust particle, has a film surrounding it which is different in composition from the main mass of the substance. Our work is still in an early stage, and as progress is made it will prove to be of value to our great industries, such as soap making, leather tanning, dairying and meat packing, in which the chemistry of colloids plays an important part."