SCIENCE NEWS

THE EXCAVATION OF MAYA CITIES

Science Service

AN archeological expedition from the Carnegie Institution of Washington, headed by Dr. Sylvanus G. Morley, is about to leave New Orleans for Mexico to begin excavations of the buried cities of the ancient Maya empire of Yucatan near the Port of Progreso.

Inauguration of a ten-year program of archeological research in cooperation with the Mexican government has been delayed by the recent political disturbances in Mexico, but arrangements were made with Dr. Manuel Gamio, director of the Mexican Bureau of Anthropology, during his recent visit to this country, to begin work immediately. The party taking the field for preliminary investigations and excavations at Chichen Itza includes Dr. Morley, Earl H. Morris, archeologist in charge of excavations, Monroe Amsden and O. G. Ricketson, Jr., assistant archeologists.

As a result of preliminary explorations at Chichen Itza made last winter, it was decided to take up first the excavation of "The Group of the Thousand Columns," a section of the city composed of great colonnaded halls surrounding a plaza of more than five acres in extent. Running out from this great colonnade there are smaller ones, composed, some of square columns and others of round ones, and at various places around the enclosure there are lofty pyramids which were originally surmounted by elaborately decorated temples of dressed stone.

The luxuriant tropical vegetation which has sprung up since Chichen Itza was abandoned in 1448 A. D. has buried the city in a mantle of living green; roots have found their way deep into foundations and torn stone from stone, until the roofs have collapsed, and desolation reigns. No small part of the work of the Carnegie Institution excavators at Chichen Itza will be the removal of this luxuriant tropical forest which has done so much harm to the ancient edifices.

The city was founded in the fifth century of the Christian Era by a tribe of the Maya race called the Itza. The names means "Chi," "mouth," "chen," "wells," "Itza," the name of the tribe which founded the city: "The mouths of the wells of the Itza." This name was given to the place because of two great natural wells which are there, and which afforded an inexhaustible water supply in a land which is conspicuous for the absence of surface or flowing water. It is not too much to say that the presence of two such wells at one place predetermined under primitive conditions that a large center of population should one day grow up around them.

One of these wells was used as a source for the water-supply of the city; the other as a place of sacrifice wherein the most beautiful maidens of the tribe were hurled in times of great drought as sacrifices to the offended rain deities. To-day the vast courts and colonnades, the lofty pyramids and spacious palaces, the temples and terraces, are silent; a great forest has overgrown them and overthrown them. It is in these remote solitudes that the ringing sound of the ax, pick and shovel of the excavator will soon be heard, and the intensive study of this former metropolis of ancient America will be commenced.

THE ISOLATION OF BIOS

Science Service

THE most dramatic moment at the recent meeting of the American Chemical Society came when Professor Walter H. Eddy, of Teachers College, Columbia, took from his pocket a small vial and passed it around among the assembled chemists. All they could see was a little white powder at the bottom of a bottle, which might have been salt or sugar so far as they could tell. Yet it created a sensation, since it was the first vitamin that any one had ever seen and handled. For many years biological chemists have been in pursuit of the elusive substances which were known to exist in certain foods and yet could not be extracted and identified because they were so small in amount, so mixed up with the complex constituents of the food, and so easily decomposed by chemical process of purification. Five or more of these vitamins have been shown to exist by the fact that when white rats are fed with foods from which some one of them is absent the animals do not thrive. They may stop growing or fall ill with various maladies or fail to reproduce.

A French chemist named Wildier in 1900 found that yeast contained a substance which in extremely small quantity would greatly increase the growth of the yeast plant. He named it "bios" but was not able to isolate it. Since then many chemists have been on its track, but none could get it out in a pure state till now, when Professor Eddy has obtained it in clean crystalline form. It is sufficiently pure to have a definite melting point, 223 degrees Centigrade, and can be analyzed. It is found to contain five atoms of carbon, eleven atoms of hydrogen, one atom of nitrogen and three atoms of oxygen in the molecules. Professor Eddy when questioned as to its chemical structure declined to commit himself positively at present but said that it might be regarded as "a reduced pyridine ring."

The same product can be extracted from alfalfa. Bios has remarkable potency as a stimulant to growth. An amount no more than three hundredths of a milligram, which is about as much of the powder as could be caught on the point of a pin, given every day to a young rat stunted by living on a deficient diet will cause it to grow again at a normal rate.

THE SEX HORMONE

Science Service

THE internal secretion that causes the sexual impulse in female animals has been discovered and extracted by Dr. Edgar Allen, of the University of Missouri, and Dr.

Edward A. Doisy, of the Washington University Medical School, St. Louis, in collaboration with B. F. Francis, H. V. Gibson, L. L. Robertson, C. E. Colgate, W. B. Kountz and C. G. Johnston.

This hormone which is obtained from the ovaries resembles the long desired "love potion" of romance and literature. Female animals treated with it take the initiative in courtship, even at an early age. Drs. Allen and Doisy believe that this extract of the contents of the ovarian follicles is the ultimate cause of sex instincts.

Young animals into which the liquid is injected become mature before they normally would. For this reason the discoverers of the ovarian hormone think that it may be responsible also for the development of the feminine characteristics which physiologists call secondary sex characters.

Evidence has been obtained that all female animals have the same sort of ovarian hormone, just as the internal secretions from the thyroid, pancreas, adrenal and other glands are effective regardless of the animal from which they are obtained or the animal in which they are used. Extracts of the new hormone obtained from swine stimulated the sexual impulse in mice and rats. Similarly, animal extracts are being used in experiments on human beings with favorable results.

"We have high hopes for the therapeutic value of this product to medicine in the treatment of hypo-ovarian disorders," Dr. Allen declares. Subcutaneous injection of small quantities of the ovarian hormone at intervals of four to eight hours bring about reactions in rats and mice similar in all respects to the natural effects. The results of the treatment are apparent 48 hours after the first injection.

Tests made on commercial ovarian extracts now in the market show that these preparations fail to act like the new hormone. The investigators have also found that the hormone when administered by mouth does not produce the desired effects. It has no effect on the sexual functions of the male animal.

INOCULATION AGAINST CHICKEN-POX

Science Service

EXPERIMENTS made at the Johns Hopkins University by A. A. Weech indicate that chicken-pox may be prevented by inoculating persons known to have been exposed with a serum obtained from convalescent patients. He gave this treatment to nine infants who had been exposed. Only one of them contracted the disease in a mild form after a long incubation period. The work is a continuation of similar experiments of a year ago, and is similar to the method used in preventing measles.

Chicken-pox, while not a serious disease, is very contagious and spreads rapidly, especially among children in schools. Attempts have been made previously to prevent the disease by vaccinating the children with the material obtained from the little blisters which occur on the skin. The results have been of interest, and the method appears to have had considerable value in checking the disease.

Experiments made on the prevention of measles by injecting the children exposed to the disease with serum taken from the blood of those who had recently recovered gave promising results, and last year workers at the Johns Hopkins University tried the same method in chicken-pox. Out of 42 children inoculated within five days of exposure to the disease, seven contracted a mild form, and thirty escaped without symptoms.

OIL BURNING ELECTRIC ENGINES

Science Service

A CONTRACT for the construction of a new type of electric locomotive, using oil for fuel for an internal combustion engine of the Diesel type which in turn will drive the generators furnishing power to the drivers, has been signed by a large railway system with the General Electric Company and the Ingersoll-Rand Company. The new locomotive is designed for switching purposes.

The power equipment of the locomotive consists of a 300 horsepower oil engine manufactured by the Ingersoll-Rand Company, directly connected to a 200 kilowatt General Electric generator. The motive power consists of four HM-840 motors, one of which is geared to each of the four axles. The unit has a total weight of 60 tons all on the drivers.

The Ingersoll-Rand unit is a six cylinder engine designed to burn fuel oil and having the features of the well-known Price system of direct fuel injection. This system avoids the use of high-pressure injection and also effects a reduction in weight, an improvement of mechanical efficiency and an increased simplicity and reliability. The fuel is injected into the various cylinders through a distributor by means of a single acting plunger type pump. The lubricating system is of the continuous filtration type by means of which the oil is returned from a crank case through an oil filter before being returned to the system again.

All parts of the cylinders, cylinder heads and combustion chambers are water cooled by means of a thermostatically controlled water supply. The water from these water jackets passes to a radiator located on the roof and a thermostat maintains an even temperature regardless of weather conditions. Sufficient fuel can be carried for 48 hours continuous switching service. The muffler for reducing the noise of the exhaust is also mounted on the roof.

As ordinarily used in switching service, this 60-ton locomotive consumes between 20 and 26 cents worth of fuel oil per hour. The engine is free from smoke and therefore especially suitable for service in cities or other places where smoke is objectionable.

TESTING RADIO "A" BATTERIES

Science Service

TESTING radio "A" batteries with an ammeter is not a satisfactory scheme by which to determine the best brand, according to the caution of Mr. George W. Vinal, chief of the battery section of the National Bureau of Standards. Mr. Vinal explains that some of the very best and longest lived "A" batteries do not give as high an ammeter indication on this test as other brands that are very inferior in performance.

It is all right to test a radio dry cell with an ammeter in order to determine that it has not gone dead on the dealer's shelf and a satisfactory "A" battery will give 20 to 24 amperes or more on such test if it is in good condition. But the batteries which give 30 or 35 amperes are often no better than those which give 20 or 24 amperes on this test, in fact many of them are much inferior.

Mr. Vinal explains this by pointing out the fact that the short circuit current indicated in this fashion depends as much upon the internal resistance of the battery as upon its condition. Some of the batteries which have the longest life in actual service are purposely built by a method which gives somewhat high internal resistance. And, therefore, these batteries, although the best and cheapest in the end, do not seem to have as great a "kick."

Mr. Vinal also warns against careless testing, or much short circuiting of batteries in this fashion. It takes only a short time to ruin a cell if short circuited. Hence the ammeter test should be made very quickly and every precaution taken to allow the battery to discharge only momentarily at so high a rate.

THE MELTING OF THORIUM OXIDE

Science Service

THE most refractory substance has been melted. Thorium oxide has been fused by the scientists at the U. S. Bureau of Standards. The work was done by C. O. Fairchild and M. F. Peters in the course of a research which involved the melting of platinum, and the thorium oxide was melted to enable crucibles to be made of it to hold the molten platinum.

The oxide is used commercially in incandescent gas mantles. It does not melt at the temperature attained in the gas flame, which heats it white hot. As ordinarily prepared, it is a fluffy white powder which upon heating to high temperatures gradually shrinks in volume.

But no matter how high it is heated there is still some shrinkage left. So it occurred to the investigators to take all the shrinkage out of it by melting it, something that had never been done before.

The exact details of the method have not yet been made public, beyond the fact that it was melted in a hollow formed in a heap of the powdered substance. Nothing else could be used, for it melts at a temperature only found in the electric arc, hot enough to melt or vaporize any other container. Platinum melts at a temperature of about 3,200 degrees Fahrenheit, while the melting point of thorium oxide is probably almost twice as high.

The peculiar value of crucibles made of this substance is that molten platinum may rest in them for some time without absorbing enough of the thorium oxide to be detected in a spectroscope, so permitting the metal to be purified.

A SOUTHERN NATIONAL PARK

Science Service

FURTHER progress toward the establishment of a National Park in the Southern Appalachians has been made through the selection by the Council on National Parks, Forests and Wild Life of two representatives to serve on a committee being formed by Secretary Work of the Department of the Interior. The council has chosen as its delegates Harlan P. Kelsey, formerly president of the Appalachian Club, and William C. Gregg, of the National Arts Club, known for his work in thwarting attacks by industrial interests upon Yellowstone National Park.

Secretary Work's aim in appointing the committee is to secure an impartial report on a site in the Southern Appalachians that will most worthily represent that region in the National Park system. There are already National Forests in the Southern Appalachians, acquired under the Weeks law for the protection of navigable streams. These are intended to be operated on a strictly business and economic basis, while national parks are designed solely as places where Nature's own ways of doing things are to be maintained and protected, as examples of plant and animal life undisturbed by human agencies, and where the populations of crowded cities may obtain needed contact with the wilderness.

There is a growing demand in the south for a national park, and Secretary Work has decided to refer its location to a group of men, qualified to choose one most typical of the natural beauty and wild life of the southern mountains. The chairman of the commission is Henry W. Temple, representative in Congress from Pennsylvania and formerly professor of history in Washington and Jefferson College; the Department of Interior is represented by Colonel Glenn Smith, of the U. S. Geological Survey, while the only other member aside from those selected by the Council on National Parks, Forests and Wild Life, is Major William A. Welch, whose work with the Palisades Interstate Park is well known.

ITEMS

Science Service

THE amount of power received and developed by a small loop antenna radio receiving set has been calculated by Dr. W. R. Whitney, research chemist of the General Electric Company. At the recent meeting of the American Chemical Society he said that a loop one foot in diameter, in receiving radio impulses at Schenectady from San Francisco, received such a minute amount of energy that the energy set free by a house-fly in climbing one inch up a wall would equal what was received day and night and for a continuous period of 35 years.

A SMALL mollusc, known as a Pholand, has been reported to have caused extensive injury to the brickwork at the entrance to one of the drydocks at Calcutta. The creature eats its way into the bricks where the surface glaze has been destroyed. In this particular case they were destroyed after having penetrated to about half an inch, but it is believed that except for that they would have destroyed all the brickwork.

THE electrical resistance of a wire becomes practically zero at the temperature of liquid helium. Thus a hairpin could carry all the electric power of Niagara.