SCIENCE NEWS

A NATIONAL SCIENCE BUILDING IN WASHINGTON

Science Service

A NATIONAL center of science in America, an imposing building erected by the National Academy of Sciences and the National Research Council, will be dedicated here on April 28 in connection with the annual meeting of the National Academy of Sciences.

The building will be of general public interest for two reasons; first, on account of its artistic design and the beauty of its sculptures and paintings, and, second, because there will be a continuous series of exhibits illustrating striking natural phenomena and the recent discoveries of science. The new scientific building occupies a prominent site overlooking Potomac Park and adjoining the beautiful Lincoln Memorial. The cost of the building was about one and one half million dollars, besides the grounds, which were purchased by gifts from private donors. On March 28, 1919, the Carnegie Corporation of New York made a gift of five million dollars to the National Academy of Sciences to erect the building for the academy and the National Research Council, and to provide for the maintenance of the building and for the endowment of the National Research Council.

The exhibits, which will be established in the central rotunda under the great decorated dome and in the adjoining rooms, will be of a different sort from those ordinarily found in museums, for they will be for the most part so arranged that the visitor may himself perform the experiment or verify the discovery which they present. For instance, mirrors are so arranged above the central dome as to catch the light of the sun at all hours and throw the rays through a telescopic lens which, mounted in the zenith of the dome, projects an image of the sun about six inches in diameter upon a table in the middle of the hall. This is sufficiently large to show the spots on the sun, the announcement of which by Galileo in 1612 before the Lincei Academy at Rome created such a sensation and precipitated his persecution. Day by day, the movement of these spots across the sun's disk may be watched by visitors. A portion of the light from the solar image is resolved by a fine ruled grating into the spectrum of its component colors on which may be observed the Fraunhofer lines revealing the chemical elements in the gaseous envelope of the sun. In order to verify the existence of these elements of the sun, all the spectator has to do is to turn a switch and the bright lines of the spectrum of iron will appear side by side with the dark lines of iron in the solar spectrum.

Here, also, will be found in actual operation four of the amazing measuring instruments devised by Professor A. A. Michelson, president of the Academy of Sciences, who received the Nobel Prize for his researches in light. The visitor may himself manipulate the interferometers which made possible the measurement of the wave length of light and the diameter of such distant stars as Betelgeuze. Even though he be not an athlete, he can twist with his own hands a bar of steel of more than an inch in diameter, and measure the torsion by the interferometer.

The Weather Bureau has installed a complete set of recording instruments of the latest and best types. Two seismographs will be set up and visibly record any earthquakes that may occur. The Department of Terrestrial Magnetism of the Carnegie Institution has provided instruments for determining the variations in the earth's magnetism and the electrical potential of the atmosphere.

Any tourists coming to Washington who are yet unconvinced that the earth turns around may verify its rotation for themselves by watching the swing of the Foucault pendulum suspended from the center of the dome.

One of the rooms is nearly dark and here the visitor may see for himself the collision of atoms and the tracks of the flying particles by means of a Wilson-Shimizu apparatus. In this the alpha particles driven off from the atoms of radium at a speed of 20,000 miles a second leave a trail of luminous fog by which their route may be traced.

By peeping into the spinthariscope, the visitor can count the projected particles of radium by the flashes of light produced as they strike. Here, too, he may watch the perpetual dance of microscopic particles due to the jostling of the molecules—what is known as the "Brownian Movement."

One of the most beautiful sights in the world is here shown, the formation of crystals under polarized light showing all the colors of the rainbow. Professor R. W. Wood, of Johns Hopkins, will show how the world would look to us if we had the power of seeing by the "dark light" of the ultra violet-rays.

The latest developments of radio are shown side by side with classical experiments like that of Faraday's apparatus of 100 years ago for the production of electrical current by means of a magnet, which laid the foundation for all of our utilization of electric light and power.

An arrangement has been made by which the visitor himself can control the exhaustion of a vacuum tube and watch the beautiful effects caused by the passage of the electrical discharge through the rarefied gas.

A unique and most interesting exhibit will be the demonstration of the pressure of light which was unsuspected, even by scientists, until very recently, but which is now known to be the force which drives out the minute particles of matter forming the tail of a comet, and expanding the giant stars. This is shown by a radiometer, invented by Professor Ernest F. Nichols, of the Nela Park Laboratory, Cleveland.

Dr. Charles D. Walcott, secretary of the Smithsonian Institution, will exhibit the oldest fossils that have yet been discovered in which the internal anatomy has been preserved. Some jelly-fishes, worms, trilobites, sea cucumbers and other animals that lived during Middle Cam-

brian times and which are now preserved in rocks from the Rocky Mountains will be shown.

The famous dinosaur eggs, recently discovered by the expedition of the American Museum of Natural History in central Asia, will be exhibited by Professor Henry F. Osborn, in connection with an address which he will deliver to the academy on the results of the expedition.

In an exhibit from the Department of Agriculture, Dr. W. W. Garner will show how the growth of plants can be increased or diminished by regulating the amount and kind of light.

The infinite variations that every feature of the human body and skeleton can undergo, both racially and individually, will be the subject of an exhibit by Dr. Aleš Hrdlička, of the Smithsonian Institution. He will also show the most recently discovered remains of ancient man in Europe.

Very sensitive devices for measuring the heat of the sun and stars will give the visitor an idea of the scientific work being conducted by Dr. C. G. Abbot, assistant secretary of the Smithsonian Institution, who is keeping track of these great heavenly power plants. Both the radiometer to be used this summer at Mount Wilson Observatory in determining the energy spectra of the stars and the silver disc pyrheliometer used to measure the heat of the sun will be on exhibition.

One room will be arranged for showing scientific motion pictures, and microscopes will be provided for the projection of swarms of living infusoria and growing plants.

Some of the exhibitions will be permanently installed, but most of them will be changed from time to time in order to show new inventions and discoveries in various fields of science.

Important exhibits, the details of which are not yet completely determined, will be made by the Research Laboratory of the General Electric Company and the Rockefeller Institute for Medical Research.

THE COMMON ANCESTOR OF MAN AND APES

Science Service

DISCOVERY of three fossil jaws of a primitive creature that is believed to be an ancestor to both man and the apes has been made in the Siwalik Hills of India by Dr. Barnum Brown, scientist and explorer for the American Museum of Natural History. The first announcement of this important anthropological event was made on April 14, by Dr. William K. Gregory, of the American Museum of Natural History, at a meeting of the New York Academy of Sciences at which many other evidences for human evolution were reported.

This common ancestor of human beings and chimpanzees and gorillas is called Dryopithecus. The specimens secured by Dr. Brown and sent to the museum for study are remarkable in that they show three different stages of the evolution of Dryopithecus and come from three successive periods of time or "horizons" as the geologist calls them. Each of the jaws lacks some teeth, but they are sufficiently complete and well preserved to allow Dr. Gregory, the museum's expert on human and pre-human remains, to determine that Dryopithecus is a fore-runner of man as well as the apes. Former finds of skeletons of Dryopithecus in Europe and Asia left in doubt the question as to whether this creature that lived in India during Miocene times, the middle of the great age of mammals, was actually pre-human.

Dr. Gregory found that the patterns of the crown surfaces of Dryopithecus' molar teeth are strikingly similar to the way in which the minute furrows and cracks on the surface of the enamels of human and modern ape teeth are now arranged.

Toothaches suffered by human beings to-day can be blamed largely on Dryopithecus, declared Dr. Milo Hellman, who has determined that we have inherited much of our susceptibility to dental decay from this common ancestor of man and apes. Studies of dental records show that the germs of human teeth decay lodge most frequently in the cracks and furrows that correspond to and evolve from the pattern found on the molars of Dryopithecus. Modern apes have escaped from the ravages of tooth decay, because although they possess the same inviting cracks and furrows, they eat foods that do not allow decay to set in.

The fossil jaws of Dryopithecus were discovered by Dr. Brown as the result of explorations in the north of India, when the weather was so hot that collecting could be done only in the early morning.

In addition to announcing the discovery of Dryopithecus, Dr. Gregory called attention to the fact that Darwin's conclusion that man was an offshoot of the primitive ancestors of the anthropoid apes had been buried under an accumulation of details, but that a number of investigations now going on in New York had brought forward strong new evidence in support of Darwin's view.

Dr. Dudley J. Morton pointed out that many features in the foot of the adult gorilla approach conditions in the human foot. He showed how the continuation of the habit of living on the ground and using the feet in the way the gorilla now does might be expected to make it still more like man in the distant future. He concluded that the analysis of skeletons of man, monkeys and apes definitely supports Darwin's interpretation and discredits all other theories of man's origin.

Dr. J. H. McGregor summarized the multitudinous resemblances in the soft anatomy of man and anthropoid apes and concluded that the relationship was much closer than is ordinarily suspected. He referred especially to the close resemblances in the reproductive organs of the female gorilla and mankind.

Dr. Frederick Tilney exhibited the brains of a series of apes in comparison with a human brain and said his investigation showed that as we pass from the lowest primates or lemurs through monkeys to the great apes, the brain becomes more and more human until in the gorillas it is definitely more like man's than like the brains of the lowest primates. He exhibited a series of cross sections showing the development of certain centers and nerve tracts associated with the use of the hands which become larger and more complicated as the hands

are freed from the support of the body and as the bipedal posture becomes habitual.

Professor Henry Fairfield Osborn, president of the American Museum, said his researches on fossil mammals led him to conclude that the human line had been separated from the anthropoid line for an enormous period of time, stretching back perhaps to the lower oligocene or the second period of the age of mammals. He predicted that remote ancestors of man would be found in central Asia and that they would be large brained erectly walking primates remotely related to the anthropoids.

THE VALUE OF PREDATORY ANIMALS

Science Service

WILD CATS, wolves, coyotes and mountain lions were mixed up in a verbal battle royal between scientists attending the annual meeting of the American Society of Mammalogists here. The campaign against predatory animals as undertaken by the Federal Government was attacked as tending to upset the balance of nature and defended on economic grounds by Department of Agriculture experts.

Professor H. E. Anthony, of the American Museum of Natural History, declared that the government's present campaign against predatory animals is rapidly bringing about a critical condition. So-called predatory animals, such as the mountain lion, wolf, coyote and wild cat, are doomed to extermination over large areas, if not the entire United States. These animals should not be considered entirely harmful to man's best interest. When predatory animals have been subjected to a campaign of extermination, in nearly every instance it has been necessary to undertake stringent measures to keep down the rodents and injurious small mammals which formerly were preyed upon by the predatory mammals. In other words, the natural balance is disturbed when predatory mammals are destroyed.

Professor Anthony considers that the undertaking of a systematic, well organized and persistent campaign of extermination of predatory animals by the federal government and by the various state governments and game protective associations has an injurious effect on the public attitude toward animal life in general. The public point of view toward the lion, the wolf or the coyote, becomes prejudiced and in time a number of North American mammals are classed as "pests," "vermin," or similar opprobrious epithets, and this attitude is not conducive to the best interest of conservation.

Dr. W. B. Bell, of the U. S. Biological Survey, pointed out that the usual natural forces allow both the rodents and predatory animals to multiply inordinately and cause enormous losses to farmers and stock raisers. He presented results of examinations of the stomach contents of thousands of predatory animals killed during the past five years in all parts of the country, which showed that their favorite fare is domestic animals and not injurious rodents.

Timber wolves show a diet made up chiefly of domesticated animals, including full grown cows, calves, sheep, goats, horses and swine. Mountain lions had a strong preference for beef and venison. Over a third of the items on the coyote bill-of-fare were domestic animals with sheep and goats strongly in the lead, while bobcats also made heavy inroads on both domesticated and game animals. Dr. Bell said that the average annual destruction of livestock and game amounted to at least $50 for each coyote and bobcat and $1,000 for each wolf and mountain lion.

Major E. A. Goldman, also of the survey, pointed out that the balance of nature has long since been overthrown, and that effective control of coyotes is the urgent first need. Coyotes appear actually to be extending their range, and in recent years have pushed north through British Columbia to the upper part of the Yukon Valley, where formerly they did not occur. There is also evidence that they are extended eastward of their former range and further into the higher and rougher sections of the mountains.

As a nature lover, Major Goldman said, he did not like to contemplate the extermination of any species, but that as a practical conservationist he was forced by the records to decide against such destructive animals as mountain lions, wolves and coyotes. In his opinion these animals no longer have any place in our advancing civilization, and to advocate their protection may defeat measures vital to the future welfare of the country.

ITEMS

Science Service

FATALITIES from botulinus poisoning resulting from eating home-canned foods, such as recently occurred in a Pacific coast state, may be prevented beyond reasonable doubt by two simple precautions, according to officials of the Public Health Service. These precautions are, first, the rejection of all canned goods which on opening look or smell spoiled or tainted in the least degree; and second, the reheating to the boiling point of all canned goods before serving. It is not safe to test doubtful cans by tasting their contents before heating, as fatal cases of poisoning have occurred from this practice. The heating should be thorough, all parts of the contents of the can being brought to the boiling point. Unless one wants to risk the lives of the fowls, apparently spoiled goods should not be fed to the chickens, since there are many cases on record where whole flocks have been killed in this way. While, according to the Public Health Service, botulinus poisoning is a rare disease in proportion to the millions of cans of food packed, it is highly dangerous to eat any such food which appears to be in the slightest degree spoiled. Botulism is very rare east of the Pacific coast states in which outbreaks are much more frequent, the bacteria being apparently more common in the soil of that region. Acid vegetables and fruits which are thoroughly cooked before canning are safest. The greater number of fatalities have occurred from eating canned string beans, spinach or corn; and more deaths have resulted from eating home canned products than those which are commercially packed.