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A Weekly Summary of Current Science

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COMMON ANCESTOR OF MAN AND APES DISCOVERED

Discovery of three fossil jaws of primitive creatures believed to be the ancestors of 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 by Dr. William K. Gregory of the American Museum 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 today 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 tooth 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.

Prof. 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.

READING REFERENCE - Hrdlicka, Ales. The Most Ancient Skeletal Remains of Man. Washington, Government Printing Office, 1916.

Darwin, Charles. The Origin of Species. New York, D. Appleton and Company, 1889.

Osborn, Henry Fairfield, Men of the Old Stone Age. New York Charles Scribner's Sons, 1921.

SOUTH SEA FARMING

The common impression that the food of Samoa islanders "falls in their laps" is quite wrong, says Prof. W. A. Setchell, of the University of California. There are few edible plant products obtained there without regular attention. Every native village has its plantation where the famous bread-fruit, bananas, and cocoanuts are raised. The plantations are generally in forest clearings, and are allowed to grow up in all sorts of weeds.

NATIONAL SCIENCE BUILDING TO BE DEDICATED APRIL 28.

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 in Washington on April 28 in connection with the annual meeting of the National Academy of Sciences.

President Coolidge and several of the leading men of science of the United States will give addresses at the opening. The president of the Academy, Professor A. A. Michelson of the University of Chicago, will preside during the ceremonies. The proceedings will be opened with invocation by the Rt. Rev. James E. Freeman, bishop of Washington. Dr. John C. Merriam, president of the Carnegie Institution of Washington, will speak for the National Academy, and Dr. Vernon Kellogg, secretary of the National Research Council, will speak for the Council. In the afternoon there will be an address in the central hall by Professor T. H. Morgan of Columbia University on the physiological basis of heredity. In the evening there will be a reception given by the officers and members of the National Academy of Sciences and the National Research Council. Admission to all these exercises will be by invitation. The public will have an opportunity to see the building during the sessions of the Academy on the 29th and 30th and later.

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 one 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 S. 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 Cambrian 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 the exhibit by Dr. Ales Hrdlicka 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.

SIMPLE SCIENCE

BY HOW

Water

This is very old, much older than dinosaurs, but retains its appearance much better. It was probably the first beverage made, and is stillused a great deal.

Evolutionists tell us the first living creature did its living in the ocean. Later on it gradually took to life on the land, but hated to entirely give up what it was used to, so it took a lot ofwater with it. Even humans are more than three-fourths water. That's why we have to drink so much so we don't dry up. I heard of a man who boils it down about half so he doesn't have to drink so much. Some professors and preachers don't drink nearly enough.

There are two kinds of water - soft and hard, except in winter. Hard water contains a lot of compounds of lime and magnesia, etc., but it's hard to see unless you boil the water down. Then you can see the hardness and hear it rattle in the tea kettle. It's also hard to make a lather with hard water. Hard water is hard on soap and complexions. It's hard for some people to understand why it's called hard. All of these things show it couldn't be called anything else.

All natural water is impure. Even fresh rain-water is a little impure. Distilled water is nearly pure. That's why we use it in storage batteries. The use of stills has increased greatly during the automobile age, especially since prohibition started.

Really pure water is composed of two gases - hydrogen and oxygen. This is hard to believe. It is said nearly all our water was formed when the earth was very young. This was done by lightning flashes which caused the hydrogen and oxygen to join together to form water. This stopped when the earth ran short of hydrogen.

When water freezes it expands and bursts pipes. This is a wise provision for plumbers. Ice weighs less than water, so it floats on top. This is a wise provision for fish and skaters. Water is used for holding boats up off the land, etc.

BIRDS FIERCELY ATTACK FRESHLY SHORN SHEEP.

Mysterious and vicious attacks upon newly shorn or branded sheep in the grazing country of our northwest have at last been traced to the ubiquitous magpies which frequent the sheep ranges in great numbers. For several years the sheepmen have been puzzled by fierce attacks on sheep recently clipped or branded, the wound usually being made directly in the fresh brand mark or in some cut due to the shearing operation.

S. Stillman Berry of Redlands, California, determined to make a personal investigation of the matter and finally ran the culprits down.

It was known that in Australia the Kea parrot had been guilty of similar attacks, and, as the magpies were particularly numerous in the bottom lands where the sheep were turned in for pasture after shearing, a close watch was kept and the birds caught in their nefarious work. When these occurrences were first noticed the wounds were not usually serious, but as the practice became more common the birds seemed to acquire great dexterity in inflicting deep and sometimes fatal wounds. It was found that they usually started on animals showing bad shearing cuts. They would perch on the animal's rump and peck and tear at the flesh, the sheep meanwhile standing utterly helpless. With development of the habit the birds became so bold that they would attack uninjured animals, tearing and pecking until they had opened a hole through the thin coating of wool left after the shearing and then into the body cavity in an endeavor to reach the kidneys, which for some reason appear to be particularly delectable to the birds. They were quick to learn the location of these organs in the animal's body and to recognize the ease with which they could claw and tear their way to their objective.

While Mr. Berry notes a considerable number of attacks by the magpies, they extend over a period of several years, and he is inclined to believe that they are sporadic and not indicative of a general habit on the part of the bird. Should the habit develop into a general characteristic of the birds, the sheepmen will indeed be confronted by a serious problem.

READING REFERENCE- Buckley, A.B. The Winners in Life's Race. New York, D. Appleton and Company, 1883.

MEDIUM FOOLED BY FLASHING LIGHT

How a medium, apparently sincere, fooled himself and many followers, by causing a vacuum bulb to light up by supposed supernatural energy, is told in a report read to the Academy of Science, Paris, by Prof. Charles Richet, famous investigator of psychic phenomena.

The medium was able to perform two marvels, first, to cause a bulb with a broken filament, disconnected from any wires, to glow; and secondly, to produce the phenomenon even when he was out of the room in another part of his house.

The phenomenon was thus described: "In the darkness, the subject took an ordinary electric light-bulb, and rubbing it with his hands produced ... glimmers at first irregular, then of greater and greater strength. The luminosity persisted even between the friction movements. After a lamp had thus been rubbed several minutes, the subject grasped it with his right hand and obtained intermittent illumination or even a steady glow lasting two or three seconds, without any further rubbing.

"M.B. also produced the glow when standing at a distance from the previously rubbed bulb. He waved his hands and 'concentrated his mind' and really demonstrated flashes. He was successful even when the lamp was placed inside a glass case, also when absent in another room or on another floor."

Atmospheric conditions and dampness of the hands were said to have caused occasional failures.

The report goes on: "Anybody can produce the illumination with more or less success. Persons with an exceptionally dry skin like that of M.B. will obtain particularly brilliant results. Others will have more difficulty. But wearing of rubber gloves makes success certain for anybody. Certain lamps, notably those of nitrogen and argon, give the phenomenon with greatest intensity. At times, newspaper headlines may even be read by the glow. Any bulb seems to work somewhat, but a high vacuum with thin glass walls seems to give best results. Nitrogen and argon bulbs give a bluish light; those of neon a pink tint."

The explanation was said to be simple. The bulb acts as condenser which is charged by each rub. The charges were recorded by an Einthoven galvanometer attached by cord to the bulb. Each rub produced an abrupt curve like the classic curves of condenser charges. Theillumination correspond to the brief

discharges in the rarified atmosphere of the lamp of the electricity along the inside walls of the bulb.

It was more difficult to explain the results produced from another room. When the medium was asked to announce the lights, his verbal signs did not synchronize with them. When handed a watch and asked to produce the phenomena at irregular intervals of a predetermined number of seconds, the medium failed completely. The lamp acted independently of his will. The frequency of the flashes was automatic.

The actual work on the tests was done by MM Henry Cardot and Henri Laugier, students of Prof. Richet. The hardest to convince of the naturalness of the flashes was the medium himself.

FRENCH SOLVE FORMULA OF SLEEPING SICKNESS CURE

The mystery of the composition of Bayer 205, the famous and well-advertised German remedy for African sleeping sickness, is believed to have been solved by the French chemist, Fourneau, and his associates. A detailed account of their work has just been published in the Annales de l'Institut Pasteur.

The French scientists have composeda drug which they call "309", as absolute proof of its identity with the German drug has not yet been attained. It cures mice afflicted with the trypanosome infection that causes African sleeping sickness, and which is transmitted to human beings through the bite of the tsetse fly. It appears to be superior to Bayer 205 in that only 1-160th of the fatal dose cured mice. Like the German drug, it irritates the kidneys.

The French savants were guided in their search for the elusive formula by a study of a succession of patents taken out by the Bayer company. The compound they prepared was compared with a small amount of Bayer 205 they had at their disposal, and the two appeared to be identical.

The name "309" is merely a nickname for this interesting drug which may be invaluable in opening for settlement areas of the African tropics now devastated by the sleeping sickness. Its full name with all decorations and titles attached is: "the urea of meta-aminobenzoyl-paramethyl-meta-aminobenzoyl-1-aminonapthalene-trisulphonate of sodium 4-6-8".

Other similar but less effective substances have been prepared which it is thought may be serviceable in treating the sleeping sickness of domestic animals, which require larger doses than do human beings.

RARE INSECTS

It is all in knowing when and where to look. R.C. Shannon of the U.S. Bureau of Entomology recently collected in one day fifteen specimens of the large fly known in scientific circles as Merapioidus villosus. A few years ago this was one of the rarest of finds and regarded as a curiosity. Then Mr. Shannon discovered that in early spring the flies come to maple trees when the sap begins to run. Since then, he has taken advantage of the insect's taste for maple water and met him under the old maple tree.

SYNTHETIC HASH NEW TERROR TO BOARDERS

The traditional mystery of boarding-house hash will become even more unfathomable when thrifty landladies begin to take advantage of a new chemical concoction recently announced by M. L. Rimbert, a French chemist.

He has synthesized a rabbit flavor", a flavoring extract which when applied to beef, pork, or mutton, makes them taste like rabbit. Later experiments yielded flavors of pheasant, partridge and hare. Meat pies and croquettes containing flavored meat of the right texture can, it is said, be passed off as those of wild game and fowl. Pending the invention of synthetic bones, however, the application will have to be restricted to dishes of the "nash" variety.

READING REFERENCE - Slosson, Edwin E. Creative Chemistry. New York, Century Company, 1920.

CHEAPER PHOSPHATES BY SMELTING OF ROCK

A revolutionary method for the production of phosphoric acid, which will result in the saving of millions of dollars in freight rates now paid by the farmers, has been perfected by the Bureau of Soils of the U.S. Department of Agriculture. It consists in the smelting of the phosphate rock, briquetted with silica and carbon.

The phosphorous is driven off as fumes of phosphoric anhydride which are condensed and collected. The silica combines with the calcium. The process eliminates the old method of washing and screening phosphate rock, involving the loss of sometimes half the phosphoric acid contained in the deposit; and the further treatment with sulphuric acid which dilutes the phosphate rock one-half and compels the consumer to pay freight on much useless material.

The volatilization process gives on the contrary a highly concentrated product which can be shipped long distances in lead-lined or wooden containers. Upon reaching its destination it can be mixed with the proper carriers to increase its bulk and to reduce it to the strength required for utilization by crops.

Arrangements for development of the process on a commercial scale are being made, which will result not only in a cheaper product, but also in conservation of our resources of phosphate rock.

VOLCANIC ISLET SINKS IN THE BAY OF BENGAL

Lost, a mud volcano. The Hydrographic Office reports that one of the little splutterers along the Arkan coast in the Bay of Bengal has, after a fitful life of some 10 years, finally subsided beneath the waves.

The volcano was first reported in 1914, when a passing ship noticed it

spouting smoke and flames some 8 miles off the coast about half way from Calcutta "to Rangoon across the Bay". It was then 30 feet high. Later it was reported to have lost its pep and to have degenerated into a muddy islet about 300 yards across. Now it is gone and its epitaph is written in the breakers which surge over its site.

Mud volcanoes are common along this coast where the water is less than 500 feet deep for many miles from shore. They emerge with a sputtering of smoke and mud, which sometimes comes to a climax in a jet of flame as high as 500 feet above the sea. A muffled explosion ends this active phase and the volcano subsides, finally to sink beneath the waves.

TABLOID BOOK REVIEW

HEARING. By Robert M. Ogden. New York, Harcourt, Brace & Co., 1924.

The author, who is professor of education in Cornell University, gives in this book the cream of his twenty year investigation of the physics, physiology, and psychology of hearing. Fundamental principles and recent advances in aural science are presented in a clear and systematic manner. The work will, no doubt, prove invaluable to teachers of both music and psychology, as well as ear specialists.

RADIO WAVES HELP BLIND TO READ

A German firm has announced the succesful manufacture of electrically conducting color pigments, which will enable improvements to be made in the electrical protection of safes, and in writing for the blind. The invention is based on the cohering effect of wireless waves upon finely powdered metal.

This is said to overcome the insuperable difficulties connected with mixing metal powder with binding substances, all of which reduce the conductivity of the metal. In the new method the metal paint is welded as soon as it is cohered by the radio waves. The conductivity varies according to the different metal pigments used or the characters printed with them, and by use of a movable electrical contact device connected with a microphone, blind people are able to trace out the characters and read the writing.

BRIGHT CASHIERS QUIT PSYCHOLOGIST DISCOVERS

Applicants for jobs as cashiers in retail stores who make a medium score in psychological tests designed for them make more stable employees than those with high or low scores. Morris S. Viteles of the University of Pennsylvania announced in the Journal of Personnel Research. Mr. Viteles bases his conclusions on records of a large number of cashiers measured for ability to follow directions, for accuracy, arithmetical ability, common sense judgment, and language ability.

The first oil to be found on the Australian continent has been struck in Queensland, where a strong flow was found at 2,200 feet.
