SCIENCE NEWS

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THE "PEKING MAN"

THE famous fossil, "Peking man," whose unearthing during the past few years in a cave near Peiping, China, has added an early chapter to human pre-history, was introduced to the International Geological Congress by the group of scientists responsible for his discovery.

Sinanthropus, as this fossil man is known scientifically, is now recognized to be one of the earliest of humans, rivaling the famous ape-man of Java, Pithecanthropus, in antiquity, and dating from the earliest stage of the Pleistocene, that portion of the record of the rocks that included the great Ice Ages. Although relatively young in the history of the earth, this time is hundreds of thousands of years in the past; just how many, geologists do not as yet attempt to say with accuracy.

Dr. Davidson Black, Canadian by nationality, anatomist by profession, and directing the Chinese Geological Survey's inquiries into the recent geological past of China, acted as spokesman for the group.

More is known about Sinanthropus, China's fossil man, than any other extremely ancient human creatures, Dr. Black said. Skulls and nearly complete jaws of an adult and child have been found, and out of the débris of the Choukoutien cave where Sinanthropus must have lived for thousands upon thousands of years, a large quantity of other bones and teeth has been dug.

Only in this one locality, a cave uncovered in limestone quarrying near the little village of Choukoutien, about 25 miles from Peiping, has evidence of Sinanthropus been found. There, in 120 feet of layered dirt of ages, are found mingled the bones of Sinanthropus, bones of extinct animals, man-made tools of bone and stone, charcoal from fires that burned and cooked Sinanthropus' meals ages ago.

In scientific language Dr. Black explained how excavations and studies had caused China's fossil man to arise from this cave rubbish heap and become a link in man's common ancestry with the rest of the animals.

Not a great-ever-so-great grandfather, but rather a remote uncle, is Sinanthropus to modern man. Dr. Black and his associates feel sure Sinanthropus was not a direct ancestor of our own particular Homo kind of human being, but that he was nevertheless human in the true sense of the word. He was in a blind evolutionary alley, an off-shoot from the main stem of mankind's evolution that died out some time later in the course of time.

Despite the remote antiquity of Sinanthropus as measured by the geological layers of the earth, the chert, limestone and quartz implements that he fashioned are relatively advanced and have some characteristics that indicate that he might have been as skilled as the Mousterian men in Europe who were by no means the earliest of the inhabitants of Europe.

Truly international is this search for ancient man in China, organized by the National Geological Survey of China. At this International Geological Congress was Dr. Black, honorary director of the Cenozoic Research Laboratory, a special department of the National Geological Survey of China, generously supported by funds of the American Rockefeller Foundation. There was Père Teilhard de Chardin, Jesuit priest and native of France, lately president of the Geological Society of France, whose paleontological researches are world famous. He greeted with affection Sir Arthur Smith Woodward, the British scientist, with whom he was working when he found the canine tooth of the famous Piltdown man. Also representing China at the congress was Dr. V. K. Ting, scholar and gentleman of the world and honorary director of Cenozoic Research in China. He is a leader in Chinese science and an authority on the relationships between fossils and rocks in China.

THE EXPANDING UNIVERSE

A FEW billion years ago all the galaxies were together in a space no larger than is now occupied by one of them, but they at once began to separate, so starting the expansion of the universe.

This theory was presented to the Royal Astronomical Society in London by Professor Willem de Sitter, the Dutch astronomer, whose previous theories of an expanding universe were accepted by a large number of physicists and mathematicians. He has lately changed his views, he said, as to the origin of the expansion.

"We have to choose between three types of expanding universe," according to Professor de Sitter.

"The first type begins with zero radius at a finite time in the past, and expands to infinity. The second contracts from an infinite radius to a minimum and expands again to an infinite radius, while the third oscillates in a finite time between zero and a maximum radius.

"The third type involves a periodically recurring catastrophe, a theory of which I have a very strong dislike. Until recently I was inclined to believe in the second type.

"Lately I have come to think of the first case, where, according to the mathematical idealization, the universe contracted to a point at some definite epoch of time, the galaxies passing simultaneously through this point with the velocity of light. When the galaxies approach very near each other the mathematical approximation breaks down, so that the point becomes finite, and a physical interpretation is possible.

"The galaxies can easily penetrate each other. If you put a million galaxies in the space now occupied by one, the stars still have plenty of elbow room. Their mutual distances will still be of the order of 100,000 times their diameters.

"The truth of this theory depends on whether the time of passing through the minimum was a very critical epoch or not. It is supported by several indications of a serious crisis three or five billion years ago. The planetary system, according to modern ideas of its origin, is about that age. And a few billion years ago there

must have been some very critical event in the history of the galaxies, when they were subjected to very strong perturbations, which were responsible for their rotation, their spiral structure, and the inhomogeneous distribution of matter in them.''

SOIL EROSION

SOIL erosion that removes 126,000,000 pounds of plant food annually from fields and pastures of the United States, at a financial loss estimated at $200,000,000, will be fought with a public works fund grant of $5,000,000.

The soil conservation plan will be under the supervision of the Bureau of Agricultural Engineering of the Department of Agriculture, and the Special Board of Public Works in making the grant directed that the program be completed before November 1, 1934.

Terracing is the means to be used in controlling the erosion. The government will supply the technical direction and terracing equipment and the landowners will provide the power and labor.

A maximum amount of unemployment relief is promised for every dollar invested by the government. It is estimated that more than twice the $5,000,000 grant will be spent by landowners on labor and power in carrying out the work. Thus more than $15,000,000 will be put to work.

Agricultural engineers believe that the one-year program will provide for the terracing of approximately 4,752,000 acres of land and will supply 4,197,600 days of labor.

The Department of Agriculture estimates that 75 per cent. of the cultivated land in the United States is seriously affected by soil erosion. More than 17,000,000 acres of formerly cultivated land have been destroyed by erosion.

Conservation of the fertile top soil, one of the most important of agricultural assets, will tend to maintain the value of the land held as security for long-term loans, made directly or indirectly with government funds. It will decrease the deposits of silt and sand in bottom lands and stream channels and supplement and make more effective the program of gully control on private lands.

Funds will be allotted to the states in proportion to their cultivated areas as shown by the 1930 census.

SEA WAVES IN THE LABORATORY

WITH synthetic storms created in a miniature ocean contained in a concrete tank, Professor Kenneth C. Reynolds, of the Massachusetts Institute of Technology, hopes soon to be able to tell how to design sea-walls that will hold real storm waves at bay and prevent millions of dollars of damage to water-front property.

The institute's laboratory ocean, believed to be the first of its kind, is 20 feet long and 6 feet wide. A wedge-shaped plunger moving up and down at one end creates the miniature waves. From the moment they start rolling shoreward to break upon a sandy beach and hurl themselves against the tiny sea-wall, their behavior is observed. As they break against the sea-wall and toss spray several feet high, which is equivalent to from 25 to 60 feet in the majestic scale of nature, they carry sand and pebbles beyond the wall just as the sea does on innumerable Atlantic seaboard beaches.

The experiment continues for a time and then the amount of sand which has been carried over can be measured. With the same storm conditions a different height of wall or a change in shape of the face may be tried until the best design for a given beach section can be obtained. Waves from various directions and for different high tides will be imitated so as thoroughly to investigate the entire subject.

In the tests thus far made, the sand often has become undermined near the wall just as it does in nature. Methods for remedying this are to be investigated as well as the effect of breakwaters or other forms of offshore protection.

The best design in the miniature having been found, the results will be transferred to nature, thus eliminating the great waste now involved in trying out and altering this or that expensive scheme in a vain attempt to decrease this enormous annual property damage.

ITEMS

WOLF'S periodic comet has been sighted through Lick Observatory's giant telescope manned by Dr. Hamilton M. Jeffers. It returns to the vicinity of the sun after a journey into space that has lasted seven years. It is extremely faint and eighteenth magnitude. It is located in the constellation of Sagitta, the arrow, visible now in the eastern evening sky. Its astronomical coordinates are: right ascension 20 hours 7 minutes 57.2 seconds, declination north 22 degrees 4 minutes. First discovered in 1884, this comet was last seen in 1925. It is one of the periodic comets whose return was confidently predicted by astronomers.

SMALLPOX vaccine virus from chicken eggs instead of from calf lymph is the achievement of Colonel W. D. H. Stevenson and Dr. G. G. Butler, of the British Government Lymph Establishment. Their method will be reported in the forthcoming issue of *The Lancet*. The new method opens the possibility of large-scale production of a bacteria-free virus for vaccination, it is claimed. From twenty-eight eggs the investigators obtained enough material to vaccinate seven thousand persons. Commenting editorially on this new method, *The Lancet* points out that the new vaccine is sterile; that the method is not as arduous or expensive as the production of calf lymph, and that the yield is excellent. The method seems to represent a definite advance and to be free from the objections to which calf lymph is open. Other investigators have tried to produce a similar vaccine virus. The method reported by Colonel Stevenson and Dr. Butler is said to be a modification of the technique developed by A. M. Woodruff and Professor E. W. Goodpasture, of Vanderbilt University.