SCIENCE NEWS

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THE ORIGIN OF MEN

Homo sapiens, or man as we know him, has lived longer on the face of the earth than science has hitherto supposed. He rose from among the other primates toward the geologic age known as Miocene. This makes him some 10,000,000 years old.

Discussion on man's place among the primates presented to the International Congress of Anthropological and Ethnological Sciences meeting in London indicate that scientific opinion based on new facts and researches tends to the acceptance of these ideas.

The Oxford anatomist, Professor W. Le Gros Clark, emphasized the paramount importance of American research on the anatomy of the foot and explained that Dr. Dudley J. Morton, of the College of Physicians and Surgeons, Columbia University, finds in the structure of the foot the strong suggestion that the human stock diverged from the anthropoid line of evolution when the common ancestors of man and other primates were little larger than the modern gibbon, a relatively small animal to be seen in most zoological gardens and belonging to the same Simiidae family as the chimpanzee, gorilla and orang-utan.

The Neanderthal man, whose remains have been found plentifully in Europe, is no longer regarded as intermediate in evolution from the troglodyte apes, and man's resemblance to the gorilla is not attributed to the accident of parallel evolution upward from a remote common ancestor.

Of great interest to those who are attempting to puzzle out man's origin is the espousal by Sir G. Elliot Smith of Dr. L. S. B. Leakey's conclusion that the anthropoids branched from the parent stem as early as the Oligocene epoch, the geologic time preceding the Miocene. Dr. Leakey has investigated extensively fossil beds abounding in animal remains near the shores of Lake Victoria in Kenya, East Africa, and he offered his discoveries, Kanam and Kanjera men, as very early types.

Dr. William K. Gregory, of the American Museum of Natural History, joined with Professor G. Pinkley, of the University of London, in putting the Wadjak man, discovered in Java in 1889, into a new niche in human prehistory. This human type is known from a few fossils collected by Dr. Eugene Dubois, also "father" of the famous Pithecanthropus ape-man of Java. Dr. Dubois considered Wadjak man as a forerunner of the modern aboriginal Australians, but Professor Pinkley concluded from a study of the teeth that Wadjak man, instead, foreshadows the Mediterranean type of man which has played a much more important part in the world as we know it to-day.

COSMIC RAY EXPEDITION TO MT. EVANS

BATTLING extremes of temperature and high gales on the summit of Mount Evans in Colorado, members of the department of electrical engineering of the Massachusetts Institute of Technology have completed successfully the first field tests of the largest cosmic ray meter ever constructed.

The object of the expedition, sponsored by the Carnegie Institution of Washington, was to test the meter in a wide variety of atmospheric conditions. The meter, weighing 3,200 pounds, is one of a new type designed by Dr. Arthur H. Compton, and built in the physics laboratories of the University of Chicago.

The heart of the apparatus is a large sphere of lead at whose center is a small chamber containing argon gas compressed to a pressure of 750 pounds to the square inch. The apparatus has an automatic photographic recording device and is compensated for changes in temperature and atmospheric pressure.

The device is one of seven being built for a world-wide survey which will be carried on by the Carnegie Institution over a period of five years. It is expected these heavy meters will operate continuously for the full period of five years. With them it is hoped to learn more about the nature of the mysterious and powerful cosmic rays which continually bombard the earth.

Dr. Compton believes that the results of this investigation will enable the correlation of variations in the intensity of the cosmic radiation with solar or sidereal time, variations in the intensity of the earth's magnetic field, the sun-spot cycle and other phenomena.

The expedition to Mount Evans was under the leadership of Professor Ralph D. Bennett, of the department of electrical engineering at the Massachusetts Institute of Technology. He was accompanied by Gordon S. Brown and Henry Rahmel, of the same department.

Preliminary observations were made on the campus of the University of Denver and at Echo Lake at an elevation of 10,600 feet. The apparatus was then taken to the peak of Mount Evans, 14,120 feet above sea-level, where the barometric pressure is 18 inches, and all the extremes of summer and winter weather may be experienced in the space of a few minutes.

The apparatus is now on its way to Dr. Compton's laboratories at Chicago, where it will be calibrated with the second machine, now in the process of construction.

ECLIPSE OF THE SUN

FOR the second time this year, August 10, the moon will pass in front of the sun, producing an eclipse of that body. The eclipse will be seen from South Africa, but no expeditions from other parts of the world have gone there to observe it. This is an annular eclipse. Even though the moon will come squarely in front of the sun, the corona, the sun's outer layer, visible at a total eclipse, will not appear.

There are three kinds of eclipses. The least important, scientifically, is a partial eclipse, when the moon only partly covers the sun, making it appear something like a cookie with a piece bitten out.

A total eclipse, the kind at which valuable observations can be made, occurs when the moon passes directly be-

tween the earth and sun, and over the region traversed by the moon's shadow. The bright disk of the sun is completely covered. But the moon's distance from the earth varies each month, as it makes a complete circuit in its orbit around the earth. Thus, on August 8, it was in apogee, or farthest from us, at a distance of 252,510 miles. On August 23, it will have moved more than 25,000 miles closer, and will be only 226,650 miles away. This is called perigee.

Of course, when farthest from the earth, the moon appears a little smaller than when closest—smaller, even, than the apparent diameter of the sun. Therefore, when an eclipse occurs near apogee, the moon does not completely cover the sun, and even though it may come directly in front, there is a ring of sunlight visible around the dark lunar disk. This is what happens on August 10. The phenomenon is called an annular eclipse from the Latin word "annulus," a ring, referring to the ring of sunlight seen while the eclipse is at its height. The only astronomical observations that can then be made are those to determine the exact time that the moon comes in front of the sun, in order to check the moon's motion.

The two-hundred-mile-wide path through which the eclipse may be seen crosses Angola, Rhodesia and Mozambique, and will be at its height there about 3:00 A. M., eastern standard time. For people in this region, the sun's light will seem to have a peculiar color, because the light that comes to us from the outer edge of the sun is yellowish, and the inner part more bluish. In an annular eclipse the inner part is covered. Over all of the southern half of Africa, a partial eclipse will be seen.

The next total eclipse that will be available for astronomical observations will occur on June 19, 1936. It will be visible along a path crossing Turkey, Siberia and Japan.

SCIENTIFIC RECORD OF THE STRATOSPHERE EXPEDITION

Two complete and valuable scientific records have been salvaged from what at first appeared to be a hopeless tangle of wrecked instruments in the gondola of the ill-fated balloon explorer of the National Geographic-Army Air Corps stratosphere expedition.

One film record is the complete history of cosmic-ray intensity measurements from one of the detectors. The other is a record of temperatures in and out of the gondola, sun and sky brightness, the time of each measurement and the tilt of the gondola during the entire flight.

Finding these two valuable records spurs the hope that elsewhere in the pile of twisted instruments now being shipped to the headquarters of the National Geographic Society there may be other useful records.

With the discovery of the two new records the sum total of results now obtained for the flight include:

1. Salvage of the large spectroscope and its scientific records. This is the instrument which hung on a cable below the gondola and was released on its own parachute.

2. Recovery of part of the records taken on two other spectroscopes inside the gondola.

3. Recovery of both barographs for recording air pressure and hence the altitudes attained during the flight. The high elevation as given by both instruments is 60,613 feet—only 624 feet below the official world's altitude record made on the 1933 flight of Commander Settle and Major Fordney.

4. Proof that a stratosphere balloon can be built whose gondola is livable at extreme heights and that automatic instruments of the type employed worked perfectly. The pneumatic, automatic valve atop the balloon bag worked perfectly at all times.

RADIO FOG NAVIGATION

SCIENTIFIC men in America are finding it difficult to see how the new invention of Marchese Guglielmo Marconi for the blind navigation of vessels in a fog differs greatly from any of several ultra-short-wave radio beacons used in landing airplanes by blind flying. In fact, the case of blind navigation by radio beams for ships seems less difficult, for it is really a two-dimensional problem, while the aviation case is one of three dimensions.

So far as first reports indicate, the essential of the Signor Marconi's new development is to use two radio transmitting sets located on buoys 300 feet apart, one on either side of the ship channel. The incoming vessel finds, with instruments, the halfway mark between the two transmitters where the signal intensity is the same from both sources, and then sails along the line of signal equality. All the master of the vessel has to do is to watch a pointer and keep it centered. As an added aid he has a loudspeaker nearby from which there issue two notes, one of low and the other of high pitch. The line of the channel is found when these two notes are of the same intensity.

Airplane landing beacons used in America apply a principle comparable with that of Marconi. Two transmitters, which may give off either short- or ultra-short-waves, are located at the landing field. They project radio beams at an angle with the ground. The pilot finds his line of equal intensity, just as in the Marconi case, and then "rides" down the line of slope. Not only is he guided as to left and right (as in Marconi's system) but also is kept informed regarding up and down, *i.e.*, whether he is above or below the invisible, sloping radio line.

In marine navigation, where two ships both wish to use a channel beam at one time, collisions are avoided by having each ship keep its path two degrees to the starboard, or right, of the center line. Then the ships may pass one another with a reasonable amount of clearance.

If Marconi uses the comparison of two notes of different pitch to determine his line of the central channel, he is going back to old principles, for it has been demonstrated that it is more difficult for the ear to compare two different notes for the same intensity than it is to compare two notes, each of the same pitch, coming from different sources.

Until the Italian inventor publishes the details of his work in scientific journals it will be difficult to pass satisfactory judgment on the research. At first glance, and using only the present press sources of information, the invention does not appear to use principles not now

known. And by the same picture the work does not appear to solve a problem as difficult as those already encountered in aviation.

FOREST FIRES

LIGHTNING and excessively dry conditions throughout the Northern Pacific States were responsible for over 100 forest fires during the week ending August 4.

High winds fanned one blaze of 3,000 acres near Curlew, Washington, into a roaring furnace covering 18,000 acres. Another fire originating in Canada crossed the border over a three-mile front and entered Coleville National Forest near Vulcan Mountain. Nearly a thousand men from C. C. C. camps and the neighboring region fought the two conflagrations.

Lightning storms caused 45 fires in the Wenatchee National Forest alone. Of the 25 that were burning in the Chelan Forest, three were reported as class C, which means that over ten acres were burned. These three have laid bare a total of 780 acres of heavily wooded landscape.

Conditions in region one, the northern Rockies in Central Idaho and Montana, were reported on August 1 as still critical. Koniksu, Kootenai, Selway, Bitterroot and Clearwater National Forests all have fires. All but one in Koniksu and Kootenai are controlled. In Clearwater Forest a fire raging over 8,000 acres was still burning on August 1. It was, however, reported to be well-manned with C. C. C. crews.

Snoqualmie National Forest, in Washington, has suffered severely from 19 fires. One burned off 1,500 and another 3,000 acres of big timber.

The Forest Service has not as yet computed the extent of the damage done in the West. Reports up to the present time, however, show that this year is heading for a record of destruction from forest fires. Already the 1934 toll points to a 66 per cent. increase over the average for the past three years.

The regions that are being ravaged by numerous outbreaks are very sparsely populated. They are watched over by look-out stations on the tops of mountains, but the number of isolated blazes is so great that all the available men are occupied attempting to bring the larger fires under control.

ITEMS

Two skilled California Institute of Technology workmen have started the largest optical job since the 100-inch mirror was completed for the world's largest telescope on Mount Wilson. Preliminary grinding of the 120-inch pyrex mirror to be used in testing the final surface of the 200-inch "eye," shortly to be recast at Corning, N. Y., is under way. By spring it is expected the surface of the disc will be ground flat to within a hundred thousandth of an inch of perfection. Preliminary grinding is to continue until bubbles on the surface are removed. Machinery weighing between 40 and 50 tons is used to prepare the mirror's face for use, and is housed in a huge one-room, cork-lined laboratory building designed to keep a constant temperature which is needed to prevent distortion of the glass. The grinding tool is fastened to an arm controlled by a series of motors. Each motor gives the tool a different motion over the heavy mirror. One man, at switches, controls these operations. The other watches the progress of the grinding and supplies the necessary amount of carborundum, the grinding substance.

MANY motorists will go into the "movies" unknowingly this summer when science, with photoelectric cell and camera, makes a new survey of traffic problems. The picture-taking will not be promiscuous spying but an attempt to obtain lasting records of traffic snarls at busy intersections. In a survey planned for the State of Ohio by Professor B. D. Greenshields, of Denison University, and Professor R. S. Sminton, of the University of Michigan, a motion picture camera will be placed on a high building overlooking a busy street corner. Every second one picture will be taken. When the pictures are thrown on the screen at the regular rate of 16 pictures, or frames, a second, it will be possible to tell the speed of each car in view, the time lost in slowing up and the number of cars using the intersection. All this can be done by watching the motion of the automobiles with respect to vertical lines marked on the screen.

MOOSE, seldom seen in Yellowstone National Park by casual visitors eight or ten years ago, of recent summers have become one of the interesting tourist sights. This year these animals are being met more than ever along the roads and trails, according to Superintendent Roger W. Toll, of the park, for an abnormally large "crop" of moose calves resulted from the mild winter which turned conditions topsy-turvy in the Yellowstone. In fact, abnormal increase in all game animals had been expected. but indications now are that, except in the case of the moose, the increase was not as large as was anticipated. It has been impossible to make a satisfactory check on the increase of the game herds, however, as the early spring caused them to migrate to the summer range much earlier than usual, and for some reason the general route of migration apparently was abandoned. At present the game animals are found scattered all over the park. As a result the rangers are having difficulties in their attempts to count the various species.

THERE is a record population of trout available to anglers in Yellowstone National Park, this summer, according to a report of the U. S. Bureau of Fisheries. Basing their calculations on the number of eggs collected in the hatcheries this year, government experts estimate 75,000 to 80,000 as a minimum for the trout population. The season's take of eggs is the highest on record. The total muster of 38,190,000 eggs exceeds the mark of 1924, the previous record year, by about 6,000,000. The eggs are secured from trout trapped on their spawning migration. Records show the average yield of eggs per female trout is about 900. Thus it took 42,000 females to produce the number of eggs collected. Fishermen in other National Parks will benefit from the Yellowstone haul. Content with a record number of parent fish in their rivers, the Yellowstone Hatchery will distribute the newly-born small fry among other parks that need restocking.