

# British Science Association Talks Evolution

The first dispatches from the meeting of the British Association for the Advancement of Science at Leeds, England, are presented here. Further news of this important meeting will be given in the next issue of the Science News-Letter.

## Darwin Was Right

Yes! was the emphatic answer given by Prof. Sir Arthur Keith, president of the British Association for the Advancement of Science, to the question contained in his presidential address opening the annual meeting:

"Was Darwin right when he said man, under the action of biological forces which can be observed and measured, has been raised from a place amongst anthropoid apes to that which he now occupies?"

And this eminent London anthropologist and anatomist declared that, in rendering this verdict, he spoke not in the role of special pleader but as foreman of a jury that has been impanelled from men who have devoted a lifetime to weighing the evidence upon human evolution.

"All the evidence now at our disposal," Prof. Keith said, "supports the conclusion that man has arisen, as Lamarck and Darwin suspected, from an anthropoid ape not higher in the zoological scale than a chimpanzee, and that the date at which human and anthropoid lines of descent began to diverge lies near the beginning of the Miocene period. On our modest scale of reckoning, that gives man the respectable antiquity of about one million years."

Since Darwin made his revolutionary studies, Prof. Keith explained, an enormous new body of evidence has poured in. It is now possible to fill in many pages which Darwin had perforce to leave blank, it has been necessary to alter details of the narrative, but "the fundamentals of Darwin's outline of man's history remain unshaken!"

Evolution is infinitely more complex than was suspected in Darwin's time. Prof. Keith expressed this by saying: "To unravel man's pedigree, we have to thread our way, not along the link of a chain but through the meshes of a complicated network."

As convincing proofs of man's anthropoid origin, Prof. Keith cited the discovery that the blood of man and the great anthropoid apes give almost the same chemical reaction. Huxley's observation that there is no structure in the human brain that was not already present in that of

the anthropoid has been confirmed by thousands of anatomists. The expansion of various parts of the anthropoid brain gave man his powers of feeling, understanding, acting, speaking and learning. Darwin's psychological observations, which convinced him that the differences between the mentality of man and ape are of degree and not of kind, have been verified and extended by modern psychologists.

Despite the advances made in tracing man's past, Prof. Keith declared, there is much that is not yet understood. Why, he asked, did the brain of man make such great progress while that of his cousin the gorilla has fallen so far behind? Why does inherited ability fall to one family and not to another? In the matter of brains, why has one race of mankind fared so much better than another? Such unexplained questions as these will be answered, Prof. Keith believes, when the scientists utilize such sources of knowledge as the new researches upon the endocrine glands.

## Ice Age Man Like Moderns

*Homo sapiens*, the same sort of human being as now populates Europe, existed upon the European continent in Pleistocene times, the geologic period last preceding the present, when the great glaciers came. This was the assertion of Sir W. Boyd Dawkins, veteran British anthropologist who was a co-worker of Thomas Henry Huxley. In those ancient times man appeared in what is now Europe as an immigrant from Asia and even then he had the same physique as the basic population of present-day Europe. "When we look back upon the long period taken by man to ascend from the position of hunter to that which he now holds," he said, "we may look with confidence to future man ascending the scale still further."

## Englishmen Growing Taller

Looking into this future, Prof. F. G. Parsons of the University of London, delivering the anthropological presidential address, predicted the physical characteristics of the future Englishman. His height will increase from the present average of five feet five inches to five feet nine. Even now this stature is attained by the well-to-do classes. The women will have an average height of five feet six or seven inches. The head

of the future Englishman will increase in proportional height and decrease in proportional length, Prof. Parsons said. This physical high-browedness Prof. Parsons believes to be a real evolutionary process brought about by the changed conditions of life in the last century.

## Little Future for Antarctica

Little hope for the settlement of the great unknown Antarctic continent is held out by Dr. R. N. Rudmose Brown in his presidential address before the section of geography.

"The Antarctic has no human problems comparable with those of the Arctic," he said. "It is true that whaling has recently invaded the Antarctic, with the vessels in the Ross Sea, not to mention the sub-Antarctic whaling in South Georgian and Falkland waters. But this can be little more than a passing phase. Already some species of whales show signs of depletion of numbers, and unless whaling is so rigorously shackled by regulations as to make it of little profit compared with the risk it entails, the industry must kill itself in a few years' time. For the rest there is nothing of value in commerce in the Antarctic: certainly nothing that it can possibly pay to exploit. The stories of future Antarctic coal mines can be dismissed as a dream without any solid foundation. It is fortunate. And those of us who care for the wild waste spaces of the world are glad to think of the Antarctic as free from invasion by our modern civilization with its insistence on hurry and noise. We are glad to remember the lonely places of the world and their matchless beauty, content to know that to others they will bring the same fascination they did to us in years gone by."

With regard to the Arctic, Dr. Brown sees the possibility of scattered colonists of pastoral interests and fur farms here and there supplying high-priced Arctic furs in limited numbers.

"The settlement of the Arctic must wait until the pressure of population on the world's resources is even greater than it is today," he said. "The remoter parts, those without rich tundra and the ice-covered seas and lands, must remain deserts, visited only by roving hunters and occasional explorers. In short, I see a shrinking of the Arctic wildernesses,

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but never their disappearance. I cannot take as glowing a view of Arctic settlement as Stefansson can, or visualize the same attraction to population which he forecasts, and I am skeptical of the value of Arctic lands as stations on the air routes of the future. But even if he has overstated his case, his long-sighted views have done something to dispel current misconceptions and reduce the area of polar wastes."

## Universe's Size Measured

One hundred million light-years. Such is the approximate maximum radius of the universe as estimated by Prof. E. T. Whittaker of Edinburgh University in his presidential address before the section on mathematical and physical sciences.

The light that is used as a yardstick travels at the rate of 186,000 miles per second. Multiply the number of seconds in a year by this factor and then by a hundred million and the product will be the mileage of the universe's radius.

Light appears to an ordinary mortal to be traveling always in a straight line, but Einstein's theory of relativity, upon which Prof. Whittaker's calculations are based, holds that the straightest light ray is curved, due to the presence of matter. Most of the universe is a vast void of space even in a thickly populated region such as in our galaxy, so the curvature due to the total mass of matter is very slight and it takes a long time for light to make the circuit. Physicists explain that the universe is finite but boundless, very much as the surface of the earth has no end but does have definite size. A ray of light starting out from a star because of this curvature of space is capable of traveling around the universe and reaching its point of origin from the opposite direction. By a strong magnetic field with laboratory apparatus it is possible to produce a curvature of space corresponding to a radius of only one hundred light-years but this action is confined to a very limited area.

## Would Tap Earth Heat

Thirty-one million times as much heat as there is in the whole coal supply of the world, heat enough to raise from freezing to boiling point sixteen thousand nine hundred million million million tons of water, lurks far under the surface of the earth awaiting a taker. This is not the dream of an H. G. Wells but the

bold project of an English engineer, John L. Hodgson.

It is probable that the internal heat of the earth is increasing, Mr. Hodgson said, thus balancing the losses due to radiation from its crust. This increase in geothermal heat is due to friction of the deep-lying rock layers as they slide over and crush each other.

A possible way of capturing the earth's internal heat would be to sink great shafts to a depth of five miles, connecting them by horizontal passages thirty miles long and ten feet in diameter. Such a hole would cost not more than thirty million dollars, or only ten times the cost of a power station capable of an equal yield of power but requiring endless feeding with fuel. The average yield during the first thousand years of its operation from such a shaft would be fifteen thousand eight hundred British thermal units per second, with never a shovelful of coal or a quart of oil burned.

The cost of sinking these giant shafts might be reduced if valuable ores were encountered on the way down. Technical difficulties of keeping workers alive could be met, Mr. Hodgson thinks. Heat-proof suits and ventilation cooled with liquid air from great cylinders were two of the suggestions he made. He likened modern man now sitting on these vast stores of unused internal earth heat to the earliest generation of coal miners who timidly scraped surface outcroppings. They knew there were great supplies of coal at deeper levels, but could not get at them with the crude equipment they had. Now modern machinery is getting that coal, and the gigantic engineering enterprise of our descendants may similarly tap the energy of the earth itself.

## New Methods in Physiology

"The proper study of mankind is man"; and this holds for his inner physiology as well as for his mental and social activities. So claimed Dr. C. G. Douglas of St. John's College, Oxford, speaking before the physiology section.

Experiments on animals are all very well for rough comparative results, Mr. Douglas said, but when we want to find out how the human machinery really works we have to make our observations on a man. This does not involve punching holes in him or sawing him up; it is the physiology of whole, normal, active human beings we are principally interested in, and this can be studied without pain

or inconvenience to persons who volunteer for the work.

Good beginnings have been made in the study of human physiology, Dr. Douglas stated, especially in the field of oxygen requirement and other aspects of respiration. Food and its assimilation furnish an equally promising field, but one that has been less explored. Still other possibilities may be found in the chemistry of the blood and in the action of the nervous system.

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