



## DARWIN THEORY IS DEFENDED

Presidential Address Before British Association Tells of Discoveries

### SIMPLY STATES FACTS

Sir Arthur Keith Does Not Make Any Special Plea But Says Let Truth Speak

More complete reports of the proceedings of the British Association are now to hand and the London Times publishes the following account of the leading paper of the great annual scientific gathering, the presidential address of Sir Arthur Keith:

"Fifty-six years have come and gone since 'The Descent of Man' was written; an enormous body of new evidence has poured in upon us. We are now able to fill in many pages which Darwin had preferred to leave blank, and we have found it necessary to alter details in his narrative, but the fundamentals of Darwin's outline of man's history remain unshaken. Nay, so strong has his position become that I am convinced that it never can be shaken.

"Why do I say so confidently that Darwin's position has become impregnable? It is because of what has happened since his death in 1882. Since then we have succeeded in tracing man by means of his fossil remains and by his stone implements backwards in time to the very beginning of that period of the earth's history to which the name Pliocene is given. We thus reach a point in history which is distant from us at least 200,000 years, perhaps three times that amount. Nay, we have gone farther, and traced him into the older and longer period which preceded the Pliocene—the Pliocene. It was in strata laid down by a stream in Java during the latter part of the Pliocene period that Dr. Eugene Dubois found, ten years after Darwin's death, the fossil remains of that remarkable representative of primitive humanity to which he gave the name Pithecanthropus, or Ape-man: from Pliocene deposits of East Africa Mr. Reir Moir has recovered rude stone implements. If Darwin was right, then as we trace man backwards in the scale of time he should become more apelike in form—nearer to the ape. That is what we have found. But if we regard Pithecanthropus with his small and simple yet human brain as a fair representative of the men of Pliocene period, then evolution must have proceeded at an unexpectedly rapid rate to culminate today in the higher races of mankind.

### A "ZIG-ZAG" DESCENT

The evidence of man's evolution from an ape-like being, obtained from a study of fossil remains, is definite and irrefutable, but the process has been infinitely more complex than was suspected in Darwin's time. Our older and discarded conception of man's transformation was depicted in that well-known diagram which showed a single file of skeletons, the gibbon at one end and man at the other. In our original simplicity we expected, as we traced man backwards in time, that we should encounter a graded series of fossil forms—a series which would carry him in a straight line towards an anthropoid ancestor. We should never have made this initial mistake if we had remembered that the guide to the world of the past is the world of the present. In our time man is represented by many and diverse races—black, brown, yellow, and white, some expanding, others disappearing. Our searches have shown that in remote times the world was peopled, sparsely it is true, with races showing even a greater diversity than those of today, and that already the same process of replacement was at work. To unravel man's pedigree, we have to thread our way, not along the links of a chain, but through the meshes of a complicated network.

"As in our search for man's ancestry we expected to reach an age when the beings we should have to deal with would be simian rather than human, we ought to have marked the conditions which prevail amongst living anthropoid apes. We ought to have been prepared to find, as we approached a distant point in the geological horizon, that the forms encountered would be as widely different as are the gorilla, chimpanzee, orang, and gorilla, and confined, as these great anthropoids now are, to limited parts of the earth's surface. That is what we are now realizing; as we go backwards in time we discover that mankind becomes broken up, not onto separate races as in the world of today, but into numerous and separate species. When we go into a still more remote past they become so unlike that we have to regard them not as belonging to separate species but different genera. It is amongst this welter of extinct fossil forms which strew the ancient world that we have to trace the zig-zag line of man's descent.

**NO FINALITY YET**  
The President, continuing, said that finality had not yet been reached and that many issues had not yet been made clear. We did not know why the brain of man had made so much progress while that of his cousin the gorilla had lagged behind, although, as Sir Ray Lankester had

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.

"Our geological search has not produced so far the final and conclusive evidence of man's anthropoid origin; we have not found as yet the human imago emerging from its anthropoid enclosure. Why, then, do modern anthropologists share the conviction that there has been an anthropoid stage in our ancestry? I must touch on the sources of this conviction only in a passing manner. Early in the present century Professor G. H. F. Nuttall, of Cambridge University, discovered a trustworthy and exact method of determining the affinity of one species of animal to another by comparing the reactions of their blood. He found that the blood of man and that of the great anthropoid apes gave almost the same reaction. Bacteriologists find that the living anthropoid body possesses almost the same susceptibility to infections, and manifests the same reactions as does the body of man. So alike are the brains of man and anthropoid in their structural organization that surgeons and physiologists transfer experimental observations from the one to the other. When the human embryo establishes itself in the womb it throws out structures of a most complex nature to effect a connexion with the maternal body. We now know that exactly the same elaborate processes occur in the anthropoid womb and in no other. We find the same vestigial structures—the same 'evolutionary postmarks'—in the bodies of man and anthropoid. The anthropoid mother fondles, nurses, and suckles her young in the human manner. This is but a tithe of the striking and intimate points in which man resembles the anthropoid ape. In what other way can such a myriad of coincidences be explained except by presuming a common ancestry for both?

### HUMAN BRAIN AND MIND

"The crucial chapters in Darwin's Descent of Man are those in which he seeks to give a historical account of the rise of man's brain and of the varied functions which that organ subserves. How do these chapters stand today? Darwin was not a professional anatomist and therefore accepted Huxley's statement that there was no structure in the human brain that was not already present in that of the anthropoid. In Huxley's opinion the human brain was but a richly annotated edition of the simpler and older anthropoid book, and that this edition, in turn, was but the expanded issue of the still older original primate publication. Since this statement was made thousands of anatomists and physiologists have studied and compared the brain of man and ape: only a few months ago Professor G. Elliot Smith summarized the result of this intensive inquiry as follows: 'No structure found in the brain of an ape is lacking in the human brain, and, on the other hand, the human brain reveals no formation of any sort that is not present in the brain of the gorilla or chimpanzee.... The only distinctive feature of the human brain is a quantitative one.' The difference is only quantitative, but its importance cannot be exaggerated. In the anthropoid brain are to be recognized all those parts which have become so enormous in the human brain. It is the expansion of just those parts which has given man his powers of feeling, understanding, acting, speaking, and learning.

"Darwin himself approached this problem not as an anatomist but as a psychologist, and after many years of painstaking and exact observation succeeded in convincing himself that, immeasurable as are the differences between the mentality of man and ape, they are of degree, not of kind. Prolonged researches made by modern psychologists have but verified and extended Darwin's conclusions. No matter what line of evidence we select to follow—evidence gathered by anatomists, by embryologists, by physiologists, or by psychologists—we reach the conviction that man's brain has been evolved from that of an anthropoid ape, and that in the process no new structure has been introduced and no new or strange faculty interpolated."

**NOTICE TO APPLICANTS**  
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