The Scope and Limitations of Physical Anthropology*

PHYSICAL Anthropology is the study of Man as an animal. As the physical nature of Man underlies all his cultural activities, Physical Anthropology is the most fundamental among the subdivisions of anthropological science. As contributions to the knowledge of Man are made by numerous departments of science, periodical evaluation and review of specialist data are of importance to keep up the coherence of Physical Anthropology and also to maintain intelligent contact between representatives of the different branches of Anthropology.

Zoological Position of Man

Recent studies in comparative anatomy, embryology and physiology substantiate in general the orthodox view of anthropologists that a common ancestral stock has given rise to Man and the anthropoid apes, but this view requires to be modified in several points of detail on account of the factor of convergence that complicates human phylogenetic problems. "Resemblance is no proof of relationship", but may be due to parallelism in evolution. For example, the simian features of the extinct lemurs of Madagascar have to be attributed to parallelism, and contrary to the common accepted classification, Lemuroidea cannot be regarded as having given rise to the higher primates, as, in early geological times, they showed specialisations which were avoided by the latter. If the palæontological evidence that irreversibility is a general feature of evolutionary development be accepted, it may be inferred that the ancestral stock from which Man came did not have limbs that were specialised for arboreal life. This will lead us to the conclusion that the man-like characters of the gorilla are parallel developments. It however remains true that Man has a simian ancestry, and G. G. Simpson's superfamily, *Hominoidea*, which includes both Man and anthropoid apes is justified. Comparative physiology of *Hominoidea* is also complicated by the effects of parallel developments. Similar blood groups have, according to Zuckerman, arisen independently in Man and anthropoid apes.

Palæontological Evidence of Human Origin

The solution of most of our problems of human phylogeny will, in future, depend on fossil records as they turn up. Such fossil evidence as are now available are meagre, and have been made much of. Some of the primitive Miocene anthropoids of the old world, particularly *Dryopithecus*, show striking resemblance in their dentition to Man. The splitting up of the *Hominoidea* into several genera appears to have happened early in Miocene times. No Pliocene Man is known to us in spite of the evidence offered by stone tools referred to that age. The earliest *Hominidæ* discovered are *Pithecanthropus* and *Sinanthropus*. Taking in to consideration the relatively greater variability of Man, it appears that anthropologists have exaggerated the points of difference between *Pithecanthropus* and *Sinanthropus* and made two genera of them instead of one. While the skull, brain and teeth in *Pithecanthropus* retained primitive simian characters, the limb bones were like those of *Homo*. This is of significance in showing that the differences in limb structure between Man and anthropoid apes are very old, and that the divergence between the two groups must have taken place at a relatively remote period.

Neanderthal Man of later Mousterian date was more specialised than modern Man, who, it seems certain, was derived, not from these extreme Neanderthals, but from more generalised types of earlier date.

The study of endocranial casts is useful but has its own pitfalls. The convolution patterns in Man and anthropoid apes are not correctly impressed on the bones as in the lower animals. Too much emphasis has been laid in the past on the "simian sulcus" in the study of endocranial casts of fossil *Hominids*, but Elliot Smith has shown how misleading this "simian sulcus" can be. According to him, some modern human brains occasionally develop a sulcus which is easily mistaken for the simian sulcus.

In the study of individual skeletons there are considerable difficulties due to our inability to eliminate variations due to differences in habits, diet, etc. Even the determination of sex offers difficulties when only skulls are available for study.

Physical Anthropology of Race

There is considerable overlap in racial characters even among primary races owing to the "reticulate evolution" of Man. Many of the racial characters now adopted are themselves susceptible to environmental influences, which may obscure fundamental similarities. Blood groups are more reliable, but there seems to be no correlation between them and body types. The determination of racial characters of prehistoric peoples from a study of their skeletons is again of uncertain value. The Grimaldi skulls of Europe, for example, were regarded as Negroid, but Elliot Smith was of opinion that they were merely variants of the Mediterranean race. R. A. Fisher has also shown the greater advantages of the study of the living over that of skeletal material.

The Future of Physical Anthropology

With the handicaps inherent in the material, and with the existing technique, it is doubtful if sensational progress will be made in Physical Anthropology. But biometry still holds the key to the understanding of the composition of geographical groups of Man. Physical Anthropology will have to become more of a field science and study Man as he is to-day, attacking such problems as the relation of nutrition to physique, effects on physical types of change of environment, the phenomenon of twinning, the relation of bodily types to mental traits, etc. Human genetics will have to be studied by the anthropological method. Various formulæ have been devised for assessing the nutritional status, but anthropologists will have to determine what the normal physical type is for a given population.

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* Summary of Address by Prof. W. E. Le Gros Clark, F.R.S., President, Section H—Anthropology, British Association for the Advancement of Science, Dundee, 1939.