

A BRIEF DISCUSSION OF ETHNOLOGY, PALAEOLOGY AND THE PROBLEM OF THE POLYGENIC ORIGIN OF MANKIND

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ABSTRACT.—Despite the general acceptance of monogenism by most interpreters of the development of man the writer rejects this view, although he does not necessarily infer that at no time in the remote past did the existing stocks of mankind come off a common stem. But this is so ancient that if mankind fell into the field of zoology rather than anthropology the existing races of men would be considered species and not races.

Therefore, he rejects the view that the wide divergences in the appearance of the existing stocks can be explained on the basis of a few genetic mutations governing a considerable number of physical traits.

Since *Homo sapiens* already existed in the early Pleistocene and divisions of mankind are necessarily very old, he suggests that the primary stocks are the result of parallel evolution.

Pekin man is often thought to have similarities to the Mongoloids, especially in regard to the torus mandibularis, torus palatinus, the Inca bone, and the shovel-toothed incisors. The study of these relationships does not, however, really establish this relationship, especially as some of these features may have a functional use in the arctic where they are most obvious, and, in any case, comparative morphology cannot be taken as conclusive evidence of ethnological relationships. He considers that the long skull, with highly developed superciliary ridges, which are absent in the Mongoloids but highly developed in the Australoids would support a connection with these latter rather than the former. On the basis of anthropo-geographic distributions Pekin is nearer, in all probability, the homeland of the proto-Australoids than to that of the proto-Mongoloids.

Homo soloensis, *Javanthropus*, Rhodesian man, Pekin and Neanderthal probably all belong to one broad stream, in various stages of development, which as a group are nearer related to the Australoids than any other living stock. The European Neanderthals were an arrested branch of this stem.

He therefore considers that the Melanoid, or black races, developed out of an eastern Neanderthaloid group.

The Caucasoids and Mongoloids, in his opinion, did not spring from the so-called "progressive" Neanderthals, but probably arose from (at that stage at any rate) independent origins, the one in the West Siberian Plain and the other in the Central Siberian Plateau. Because these regions have not been as intensely investigated as other parts of the world it is probable that the ancestors of these two stocks have yet to be found.

Therefore, he concludes that there are three specific groups, which are tantamount to being species.

The objections usually raised against this view on the basis of species and sterility he holds to be quite irrelevant as sterility is no test of species.

ANY consideration of the principal palaeontological evidence of the types of early man when it is rationalised ethno-



logically raises at once the question of whether mankind is of a monogenic or a polygenic origin. This subject is of too vast a character to be dealt with, in the small amount of space available, in such a manner as to be entirely satisfying and exhausting. All that can, therefore,

be done is to hope to put briefly some of the essential facts, as they appear to the ethnologist and anthropo-geographer, in favour of a reconsideration of the generally accepted view that mankind is monogenic in origin, and to suggest that the combination of the evidence of palaeontology, ethnology and anthropogeography all tend to establish a case for polygenism.

We are well aware of the fact that there are philosophical theories which can be evolved from any polygenic basis for mankind and which may be highly prejudicial, if not, indeed, shocking to our sense of values. We believe it is because of these philosophical implications, that geneticists, palaeontologists, ethnologists and anthropologists have all tended to go out of their way to express their belief, as an article of faith, as it were, in monogenism. But, for all that, we believe that such expressions are those of faith, and not of scientific fact or demonstration, and therefore we feel that the nettle should be seized boldly, and that this tendency to distort science for preconceived philosophical reasons should be avoided.

We do not say that all the principal stocks of mankind are species *ab initio*, but we do say that they separated so early, if we are right in the conclusions which we are proposing to put, that genetic segregation has taken place so completely, that we believe that science would, had it been dealing with the lower creation and not with man, have unhesitatingly classified these major stocks as species.

More should not, however, be read into what follows than we actually say. In our classification of mankind into Caucasoid, Mongoloid and Melanoid, and in our suggestion that these are each one of them species, we do not say that any one group is less human than another, despite the fact that physically, and even mentally, they may vary considerably.

The current dogma, as Professor Ruggles Gates (1948, p. 114) has pointed out, that all mankind forms one species is attributable to the Linnaean classification of the 18th century, and from it has sprung important philosophical and political concepts. We believe that the weight of the facts challenges this Linnaean dogma, although, we confess, that perhaps except for Professor Ruggles Gates, we stand alone in doing so.

Attempts have been made from time to time to classify the number of existing groups of men on the earth. Many of these classifications have been raised on too narrow bases, such as the form of hair, the colour of the skin, or even of the frequencies of the blood groups. When, however, all criteria are considered, such as the distribution of the blood groups, an analysis of the PTC reactions, the colour of skin, the general morphology of the human body, hair form and colour, eye-colour, and the rest and when these are analysed in terms of anthropo-geographic distribution from original racial or specific foci, we believe that the classical three fold division for the existing stocks of mankind is likely to be nearest the truth. Although it is always possible that the Australoids are a separate group from the Negroids and should not be classified with them in one generalised Melanoid stock.

We cannot here go into the geographical foci from which these three major stocks came, except to say that there are good grounds for assuming that the Caucasoids arose somewhere east of the Urals, probably as far east as the West Siberian Plain, while the Mongoloids arose much further to the east, including the Central Siberian Plateau, and the Melanoids arose further south. Of these latter we believe that early two sub-foci-arose, one of which lay to the east, and probably occupied much of eastern

China, and thence southwards, and in which the Australoids developed, and the other lay south of the Himalayas, where the Negroids arose. We are therefore of the opinion that the Melanoids arose far from their present areas in which they are now most typically developed, Africa and Australia respectively for the Negroids and the Australoids. Asia, therefore, in our opinion, was the home of mankind.

It should be emphasised that an almost impassable barrier therefore lay between the Caucasoids and the Mongoloids in the north and the Melanoids in the south in the form of the Himalayas, while the white brown races evolved on the plains and steppes of Central Asia, quite distinct from the environment of plateaus and vast mountains of the earliest Mongoloids in central and eastern Asia. It was these distinct regions which allowed the unmolested evolution of these three stocks to occur, and prevented, until a relatively late stage of human development, any substantial miscegenation. While, the subsequent distribution of the Caucasoids, Mongoloids and Melanoids has been outwards from these three foci—the first into Europe and north Africa, and over the western end of the Eurasiatic mountains into India, the Mongoloids eastwards into America, and south-eastwards into China, Burma and ultimately to mingle with other stocks in the peninsulas and islands of Oceania, and the Melanoids southwards, westwards and eastwards, as they retired before the oncoming pressures of the other two stocks, and which, ultimately forced them into Africa, remote regions of their old homelands, and in Oceania, and ultimately into Australia and Tasmania.

Such a conception as this means that the three basic stocks of mankind developed at an extremely early stage—or at least started on their lines of divergence very early indeed. It is, therefore, in contrast to the views which are held by the monogenists, who looked to much later times for the development of these stocks, which they treat as "races." Many of them, as a consequence, tend to look to the divergent and variable tendencies which occur in the later so-called "progressive" Neanderthaloids of Mount Carmel, as the beginning of that divergence which led to the modern human stocks,

Others, while they would not, perhaps, place the evolution of these distinctive stocks so late as that, look to its occurring from a Neanderthal, or nearly related stock, to which ancestral type, the modern Australoids show more affinities than any of the other groups of living men.

In order to justify a relatively late divergence of this kind, attention is drawn to genetic work in which, (as in the case which William C. Boyd (1950, p. 23) mentions was communicated to him by R. A. Fisher), for instance, in the case of poultry, one, or very few, mutations affecting the feathers and combs, can also affect the skeletal features so considerably that, as a consequence, as Boyd (1950) says, "some of the skeletal changes produced were so great that a palaeontologist, presented with the skeletons but with no other data, might have given two different specimens the rank of different species, or at least different races, although they differed only in that one possessed, while the other did not, a single or perhaps a double dose of a single gene."

One does not doubt the genetic possibility of this mechanism, and, indeed, it is quite likely to have been operative, perhaps very early, to have created the basic or proto-homo sapiens types, which may have occurred as early as the beginning of the Pleistocene. But, in this particular instance, such an interpretation, that by a few great leaps the three primary stocks of mankind were developed at, or shortly after, the appearance of Neanderthal man on the horizons of prehistory does not assist us. For, against this reasoning, is to be put the fact that, despite the defection of Piltown man (the skull of which the author, following his old master in this subject, Professor Arthur Robinson, Anatomy Dept., Edinburgh University, and against the weight of the then contemporary opinion, never accepted as in any way related to the jaw) there are reasons for believing in the existence of *Homo sapiens* in the early stages of the Pleistocene (H. H. Woollard) and, therefore, it is reasonable to infer that these primary stocks, which our survey of man presents us with, had already begun to develop then.

In that case these primary divisions of men are very old—so old that they go back

to the very primitive stage at which man was created, and they are not due to a gradual growing apart of men, accumulating divergencies over the millennia to the present time, in order to establish each of them as a separate and distinct so-called "race" of mankind. Indeed, against such a view is the fact that if all three primary stocks of mankind are of one recent origin, separating into three grand races after man had emerged, then, as we go backwards, and so approach the time when we should be seeing the three stocks merging into the one primaeval unified stem from which they came, we should expect to find, progressively, step by step, as we gradually approach that parental stem, less and less variability in the types of men, than we find to-day. Yet, as Ernst Mayr (1950) admits, the very reverse is the case.

It looks, therefore, as though not a divergent evolution of the three primary stocks from a Neanderthaloid, or any other relatively recent, origin is involved, but a case of parallel development which has gone on over an extremely long period of time from the beginning of the Pleistocene, at least, which even, on most conservative dating must be 50,000 to 100,000 years ago. Consequently, a polygenic origin of man cannot be dismissed in the cursory manner which it is, as something old fashioned, by both geneticists and physical anthropologists. But, even if it is not, in the end, established, something which comes very close to it is left, namely divergence at so remote a period, followed by parallel development, that it can virtually be said that a form of polygenism has arisen.

We are entirely with Professor Ruggles Gates (1948) when he says that the principle of parallel evolution has been greatly neglected, except by palaeontologists. We realise, as he points out, that parallelism occurs wherever we look in nature, and when we consider how scanty is our knowledge of prehistoric man, and if our anthropogeographic theory of the three primaeval foci of men is right, that the Caucasoids and Mongoloids developed in regions which have never been properly explored, so that we have great gaps in our essential data, it will be appreciated that there are no grounds for dogmatic denial of the principles

of parallel development in man. Professor Ruggles Gates (1948) looks to these parallelisms, in the origin of man, going back ultimately to parallel mutations, occurring repeatedly "as all mutations do, whether or not they have any relative value."

The early skulls of *Pithecanthropus*, *Sinanthropus*, the Rhodesian type, and the later Neanderthal, to a lesser degree, are characterised by the heavy brow ridges and occipital torus, and this heavy type of skull survives in a less gross form, it is true, in the Australoids, as well as among the Korana in South Africa to some extent. It is a feature which links the Melanoid stock and the Neanderthaloid-like man. It is absent in the Caucasoids, and homo sapiens generally, and it would seem that parallel development is gradually eliminating it from the Melanoid stock.

Professor Ruggles Gates (1948) has pointed out, that among the apes, the orangutans have no such cranial tori, whereas, the chimpanzee and gorilla have, and consequently, it is possible that, developing along parallel, but of course distinct lines, one section of man (who was some form of Neanderthal-like type to Australoid) could have had them originally, and another (such as the early *Homo sapiens* who have given rise to the later Caucasoids and Mongoloids) were without them.

That parallel development was occurring throughout nature, there can be little doubt, and man is hardly likely to have been an exception. Le Gros Clark has also referred to this parallelism among the primates.

If we come to press the origins of man back to their earlier stems, before those periods at which we can speak of them as Proto-Caucasoids (one of which is represented by Cro-Magnon man, another by Chancelade and yet another by Brunn) and Proto-Melanoids (such as some "progressive" type of Neanderthaloids), we enter into a highly controversial and speculative field of enquiry, which is constantly in process of modification as new discoveries are made from time to time.

Professor Ruggles Gates (1948) would see the ancestry of the Proto-mongoloids in Pekin Man (*Sinanthropus pekinensis*) which conclusion he bases on some skull characters

in both the Mongoloids and the Amerinds. Shovel-shaped incisor teeth have been noticed in the Primitive Pekin man's skull and in the modern Mongoloids.

He also draws attention to the fact that Weidenreich made a study of the torus mandibularis and the torus palatinus in the case of Pekin man, (*The Mandible of Sinanthropus pekinensis*: a comparative study. Palaeont. Sin. Ser. D., vol. 7, fasc. 3, pp. 162ff quoted from Gates) and Professor Ruggles Gates (1948) points out that they are found with a high frequency in the Chinese, the neolithic Japanese (up to 62%), the Eskimoes (up to 97%), the Ainus (24% perhaps, as he suggests, from crossing with the Japanese), the Ostiaks (31%) and the Lapps (32%). He goes on to say—"they are thus characteristic of the Mongolian races, which are linked with *Sinanthropus* in this and other characters. This is not surprising, since *Sinanthropus* developed in the heart of what is now the Mongolian region. Their presence, in Iceland, however, favours the view of their functional development in Arctic peoples.

The fact, however, that as Professor Ruggles Gates (1948) points out, it occurs among the Scandinavians as high as 17%, and in Iceland, 68%, means that we have to generalise from these characters with some caution.

Its comparative absence from the American Indians (the Amerinds) who have only about 4%, whom most would consider related to the Mongoloids, combined with its occurrence among the Nordic Scandinavians and Icelanders, (in the latter to a much higher extent than in the Mongoloid Lapps) and among the Eskimoes, whom, in their earlier branches, the writer would classify as Caucasoid or partly Caucasoid, related to Chancelade, makes it doubtful whether we can call it a purely Mongoloid character. Hooton's reference to the Norsemen's settlement in Greenland, in 986 A.D., and the possible infiltration of this character at that time from the Eskimoes, may be partly responsible for its occurrence in the Scandinavians. But it is probably not the whole explanation.

The high incidence of these features in Iceland, and their unwanted prominence

in Scandinavia, are probably due to the fact that there is every reason to believe that the Old Eskimoid race of Chancelade stretched from northern Europe to Greenland, and Baffin Land, and that elements survived down to mediaeval times in northern European waters, the probability of which could be demonstrated if one had the space at one's disposal, from which we may well conjecture that these characters were absorbed into the Nordic strains of Scandinavia, and even, to a more marked degree, into the Atlanto-Nordic population of Iceland. What is very obvious is the gradual creep eastwards from the Behring Straits of Mongoloid arctic peoples, whose blood has mingled with, and, in the end, submerged, the Old Eskimoid so that, despite the Eskimoid culture's being one across the whole of North America and into Greenland, the western half of the Eskimoes have become Mongoloids. If this particular character has a functional value in the Arctic its spread could be extremely rapid, and precede the advance of the general Mongoloidisation of the Eskimoid race as a whole. In that event it probably arose independently in the Caucasoids and Mongoloids.

If these features were derived from Pekin Man we should expect their survival not only in the Mongoloids but also in their near relatives, the Amerinds. The fact that this is not so, makes it seem to us that they occurred probably as a mutation in the Mongoloids after the Amerinds had migrated across the Behring Straits. If this is so they are a relatively late feature in the Mongolo-Amerind stock, affecting mainly only the Asiatic branch of it and the Eskimoids, which latter, while perhaps obtaining them in part from the northern Mongoloids, probably also had them in their own right, and had already passed them into the blood stream of the northernmost Atlanto-Nordics. The significance of the suggestion made by Professor Ruggles Gates, that the characteristic possibly has a functional value in the arctic, should not be overlooked, and it may well be that its evolution developed first in the northern and most centrally situated Mongoloids, in the high lands of Central Asia, in periods of oncoming glaciation, rather than in their more easterly Amerind-Mongoloid relatives, living nearer the coast,

who at an early date were able to escape into America, and southwards, from the cold.

However this may be, whether it be argued that they are derived from Pekin Man, or whether, as we have suggested, there was an independent mutation in both the proto-Mongoloids and in the Eskimoids these traits do not seem to favour any concept of an origin from the stem of late progressive Neanderthaloids. For if the Mongoloids obtain these characters from Pekin, they are then very much earlier, and from an independent stem from that of the later progressive Neanderthals, and if, as we suggest, it is a later mutation, which occurred in the arctic or high semi-arctic, cold plateaus of Asia, and in the arctic-living Eskimoids, we should have thought it was very old in these stocks to become so very widespread. They must have separated from any common stem with Neanderthal long before the time the progressives of that stock had appeared. In any case, the fact that these features are not characteristic of the Neanderthaloids seems to throw doubt on any suggestion that the stocks and races we have enumerated can be derived from that strain.

Weidenreich has pointed to the Inca bone, as a significant feature in Pekin Man, along with the pronounced sagittal ridge and the shovel-shaped incisor teeth.

The Inca bone, which is located at the occiput, and has a low incidence in many races, is believed to have had a higher one among the Peruvian Incas, and some other Amerinds, among whom its occurrence is 15%. However, it is found among 6% of Caucasoids, (Gates 1948) but whether due to a genetic creep from Asia, or a parallel mutation, is not clear.

The pronounced sagittal ridge is found in the Amerinds and Chinese, which is explicable on the basis of a relationship of the Mongoloids to Pekin man, and its appearance in the Eskimo might be explained on the same basis as the appearance of the torus mandibularis and the torus palatinus; but its occurrence among the Australoids cannot be so attributed. Therefore, its appearance cannot be taken to infer any relationship of these widely different peoples, but can merely be looked upon as the

survival of a primitive feature which could probably have been derived from more than one ancient source. All that can be said is that it does not occur among the Caucasoids, as generally understood, nor among the Negroids.

The shovel-shaped incisor is found in the Amerinds, and up to 95% in the Mongoloid races. Its incidence is less among the Eskimoes, which seems to confirm that where these characters, which are distinctly Mongoloid, occur among them, they are intrusive from Mongoloid Arctic folk (whom we have called elsewhere Arctoids).

The same teeth occur among the Melanesians and are in a third to half of the Hawaiians, none of which occurrences are necessarily surprising, since Mongoloid elements are traceable throughout these populations. They are only 1% in Caucasoids and about 4% in Negroes. (A. Hrdlička pp429ff: R. R. Gates, P. 370, 1948.)

Weidenreich (The skull of *Sinanthropus sinensis*, Palaeont. Sin. No. 127, p. 252, quoted from R. R. Gates, Human Ancestry, op. cit. p. 93) points to a platymeria of the Mongoloids and a strong deltoid tuberosity in *Sinanthropus*, and also in the prehistoric population of Kansu in China, and in the modern Fuegians, and Professor Ruggles Gates has suggested that this might lead to the conclusion that these *Sinanthropus* features have been handed down to many of their Mongoloid and Amerind descendants.

The fact that morphologists can repeatedly point to characteristics in the Mongolo-Amerind groups, and those associated with them, as appearing in so ancient a type as Pekin man, and which are not found in the other surviving stocks, while by no means providing evidence of descent from Pekin man himself or his near relatives, does emphasise the great age of these traits, and goes a long way, as a consequence, to emphasise that we cannot believe that the existing major stocks possessing such distinctive characters can be the result of very recent speciation from so late a common ancestor as some "progressive" Neanderthaloid.

The weakness of this identification of Pekin man with the Mongolo-Amerind appears

to be in the fact that *Sinanthropus* had a long skull while, everywhere, the Mongoloid stock has a broad one. It is true that it is suggested that the Amerind was first of all long skulled, and later became broad. This, however, we believe is due to the misunderstanding of the probable ethnology of northern America, over which we believe that a Caucasoid-Eskimoid race had spread before the Mongolo-Eskimoës had appeared, but which race was submerged, and eventually absorbed by the latter over most of North America. Therefore, we feel that it cannot be argued from the succession at a relatively recent date from long to broad skulls in northern America that the change from dolichocephalic to brachycephalic has been a very late one, and is not, as a consequence, an impediment to this theory. Furthermore, it is significant that broad skulled peoples were, in fact, developed at an early time as is evident from the Boscop skull. As a consequence, it may well be that the broad-skulled ancestors of these early times of the Mongoloids will yet be found, in which case it will not be possible to claim the Pekin man as their ancestor.

Furthermore, in *Sinanthropus* the superciliary ridges are extremely heavy—even more so than in *Pithecanthropus* and most of the other genera. In this character we have a clear similarity to the Australoid type of skull rather than to the Mongoloid.

Actually it is possible, in fact, to treat *Sinanthropus* as a form thrown up out of the same stock from which later came the Neanderthaloids, and from which in time the latter's kin were derived. On the basis of the anthropo-geographical distribution of man, which we have discussed elsewhere, Pekin is, geographically, nearer the homeland of the Proto-Australoids than of the Proto-Mongoloids.

Be all this as it may, whether Pekin man is nearer to the Mongolo-Amerinds, or shares closer affinities with the Australoids, an argument which can scarcely be settled in the present state of our knowledge, where so many puzzling features are concerned, we believe that he is an ancestor of neither. He is more likely to be just a parallel line of development, which shared some features in common with more than one racial stock,

including the ancestors of the Mongoloids, but he is, for all that, in all probability, not their ancestor, no more than he need be the actual ancestor of the Neanderthaloids, and so nearly related to the Australoids. He is more likely to be an ancestor of a line which subsequently became extinct and has had little or no part in building the shape of either the Mongoloids or the Australoids, or any other surviving racial group.

If this be so, the occurrence or absence of certain minor characters, such as those already mentioned, may have no significance at all, as they would show, where they occurred, that either a fresh mutation had created them, and a functional need had perpetuated them, or that they were inherited from some ancestor who shared them in common with *Sinanthropus*.

Those morphological points, while of great interest, are not conclusive of themselves, and unless the theories derived from them fit into the general picture which we obtain from the synthesis of the whole ethnological view of the problem, complying with anthropogeographic, serological and other general ethnological criteria, as well as with the probabilities as estimated from the known prehistoric development of the various races of man, they must be rejected.

Bearing in mind that there is archaeological evidence which would tend to perceive a continuum of culture from India to northern China of the same horizon and character, or thereabouts, as that of *Sinanthropus*, and also that somewhere from northern China must have spread Australoid man later, as we have argued elsewhere, it seems to us more reasonable to see in *Sinanthropus* a representative of one or the groups of races of this proto-Australoid strain, or of some stock which arose parallel with it.

All this, naturally, must remain largely speculative. When we come to look at *Homo solonsis*, called also *Javanthropus soloensis*, who had a flat sloping forehead, we appear to be able to be little more positive, and we are entirely with Professor Ruggles Gates (1948) who links him to the Australoid.

The Rhodesian man and *Javanthropus* are both more primitive than Neanderthal,

but seem to fall into a transitional position between such as *Pithecanthropus* and *Sinanthropus*, on the one hand, and the Neanderthaloids, on the other, and it is to this stem (perhaps passing through a stage comparable to the Neanderthaloids) that the Australoids may belong. (The writer does not conceive of the Neanderthaloids as just that group of Neanderthals associated with Europe and the Mediterranean, but as a term to cover all these scattered bands of men, of one overall general Neanderthal appearance, which were either of a common ancestry, or had arisen by parallel development. From one such band the Australoids are probably developed.

Long ago Sollas concluded that the present day Australoids were descended from the Neanderthaloids, and that they were, in fact, a Mousterian survival. This would not be inconsistent with our view.

Professor Ruggles Gates (1948), in our view quite justifiably, suggests that the Neanderthaloids in Europe were an arrested branch, whereas, further east, the gradual transition to modern man took place, and when the Cro-Magnon invaders entered western Europe, (in our opinion from the east) by way of north Africa and the Mediterranean, they largely exterminated the type.

It is, therefore, probably from the eastern branches of the Neanderthal genus that the Melanoids arose. Although we believe there is sufficient evidence of the existence of *Eoanthropus* to suggest that Cro-Magnon, and the Caucasoids generally, and the Mongoloids, did not arise from the same Neanderthaloid (Palaeanthropic) foundations.

Nevertheless, though we may consider the Neanderthaloids, or the Palaeanthropic tribes of Europe, an arrested branch of the genus, they were capable of having large brains, probably at the end of their evolution, for Sergi found that a skull from near Rome had a cranial capacity of 1550 cc.

We have now briefly reviewed some of the earlier types of hominoids, which, leading up to Neanderthaloid or analogous levels, have given rise, perhaps, to the Australoids, and, even, may be, to the Negroids, as part of the same stock, in the course of discussing which we have given expression to our

doubts of the descent, as held by some, of the Mongoloids from the Sinanthropic line.

We are now left with something to say on the origins of the Caucasoid and Mongoloid stocks. In this connection it might be as well to bear in mind that Smith Woodward was of the opinion that when large excrescences develop, such as the great brow ridges of Neanderthal, Rhodesian, Peking and Java man, they indicate that the race had reached a dead-end and would not evolve into a higher race. If this is so, it is likely, on the one hand, that the Australoids are descended from a less developed type than the normal Neanderthaloid, but, sufficiently Neanderthal, for all that, to account for their own heavy frontal development, and, in that case, the Negroid must have come off at an earlier date still, and, finally, that the Caucasoids and Mongoloids, with which we are now concerned, could not be derived from any such Neanderthaloid ancestry at all.

This justifies our looking to *Homo eoanthropus* (of whose remains occasional traces turn up in Pleistocene times in Europe), as the actual ancestral type, if not ancestor in the direct line, of *Homo caucasicus*, and which traces are the remains of such occasional families and small tribes, which drifted out from Asia, the locus of the stock, into this peripheral region.

We are aware that, in their examination of the Mount Carmel Palaeanthropic (Neanderthaloid) skeletons, Keith and McCown recognised a series starting with Neanderthal and ending with Cro-Magnon. If this is not a case of some measure of parallelism, it is to be attributed to hybridisation, as Palestine abuts on to the regions which were earliest likely to be so situated as to allow of early contact with the Caucasoids of whom the first, in view of their very early arrival in western Europe, would be the Cro-Magnons. That hybridisation has occurred in the later Mount Carmel people, is the view of McCown himself.

At Alfarou, in North Africa, of the Upper Palaeolithic, there have been found remains, which are claimed to be those of a tall Cro-Magnon with a broad nose. Professor Ruggles Gates (1948) suggests that this race originated in the Sahara region, during a

pluvial period, and entered Europe from thence, leaving others behind to develop a broad nose while others, moving eastwards, mingled with the more primitive Neanderthals of Palestine. This he considers more likely than that they evolved from a mixed population of the latter, since species differentiation only occurs in relative isolation. With the latter part of this we are in entire agreement, but we feel that isolation would only be provided in west central Asia, and not in a highly desirable region such as the game-rich Sahara, and, furthermore, that a cold climate was necessary to act as the selective agent which caused the rapid advancement of the Caucasoids (and Mongoloids also). Therefore, any broadening of the nose in the Alfalou men would be better attributed to some hybridisation with Negroid types, such as is now in evidence in the Saharan and North African regions, among populations of Atlantic types, whom we derive partly from the Cro-Magnon, such as the Tureq and Berbers.

In Uzbekistan, near Baesun, in Central Asia, an 8 or 9 years old child's skull and lower jaw was discovered in 1938 buried in a cave (F. Weidenreich) with mousterian implements. Although it had well developed superciliary ridges, the chin was not receding, as in *Palaeanthropus*, the upper lateral incisors were shovel-shaped, and the brain capacity 1490 cc., which is as large as modern man, and which it is estimated when grown would have reached 1600 cc. Weidenreich looked upon it as having certain Mongoloid facial and dental features.

Such a skull is what we should expect from this region, on the premises of an inner Asiatic location for Mongoloid man, the individual concerned having been, presumably, a hybrid between a proto-Mongoloid and a Neanderthaloid, if not a Mongoloid developing from some early stock parallel to the Neanderthaloids of Europe and Palestine. From such crosses would arise the Negrito and Bushman-like strains, such as we assume arose on the frontier of the Mongoloids and the Melanoids, and which later, under the impetus of advancing cold, and the pressure of other stocks meeting before it, would pass into Africa from Asia.

Much more could be written upon the fossil remains of early man than has been at-

tempted in this very brief review. All that has been done here is to draw attention to the fact that, despite all the confusion, due, we believe, to large areas of missing knowledge, such as is provided by the paucity of information from Central Asia, which directly bears upon the ancestry of the Caucasoids and Mongoloids, and also due to the fact that we believe parallel development has occurred in many lines, there is reason to see that early fossil men can be correlated with the three basic divisions to which we have been led, by the evidence of morphology in ethnology, serology and the new techniques of anthropology, and by anthropogeographic interpretations of man's relationships, all of which we have dealt with elsewhere. (In "The Foundations of Ethnology" in particular, now being published in Hindi, by the U.P. Government)

Therefore, we have three major divisions, and these, it is arguable from the facts we have touched upon here, did not arise at some late period in prehistory, such as from the middle of the palaeolithic period onwards, but must have already been well-nigh established by that time.

If that be so, the major stocks are of great antiquity.

We have, already, in our classification of human groups, anticipated our present conclusions by using the terms stock and species as interchangeable. We are now in a position to bring this classification to a greater degree of precision by beginning to examine the specific relationships of these stocks of mankind.

In the first instance we have the Palaeanthropic (or Neanderthaloid), pretty certainly ancestral of, or nearly related to, either the Negroids or Australoids, or both, and this group, if we may follow McCown and Keith in the matter, has been considered a genus in itself. Certainly, therefore, to consider the Melanoids as, at least, a species would not seem to be going too far. In that event we can hardly consider the Mongoloids and Caucasoids, respectively, as anything less.

Whether they have diverged from one root, or *ab initio* have been independent, and arisen in parallel lines of ascent is a moot point. Certainly, the separation has been so long ago established that, in animals,

we would not hesitate to treat these groups as species.

It should be remembered that the late Dr. Henry Fairfield Osborn (1926) has gone so far as to say that the human genus is divided into "three absolutely distinct stocks (Caucasoids, Mongoloids and Negroids which in zoology would be given the rank of species if not of genera."

It is usual to think of sterility as a test of species. This, however, seems a very doubtful test. Where species show transition from one to another in time (and so form a so-called chronocline) there is no sterility barrier between them.

Sterility, so it seems, only can occur where the transition from one type to the other is spatial (a so-called chronocline); that is where a series of species, or sub-species, are in a state of transition *geographically* from one region to another. In such cases it is often found that a species from one region is sterile when mated with one from another. Since all these species (or sub-species) would be related it follows that this sterility is not a test of speciation, as has been pointed out by Dr. Henry Fairfield Osborn (1926), Dr. E. Mayr (1942) and Ruggles Gates (1948).

It may be said that sterility arises between two nearly related strains when, by mutations, changes occur in their structure as to make fertile breeding impossible. But since the mutations involved may be very few in order to effect this, while, in other cases strains may have undergone many more in other directions, without affecting the fertility of the strains concerned, how then can we infer that sterility is the test? For, in such cases, the interbreedable strains are, obviously, further apart than the infertile.

In fact, so little is sterility a real test of speciation, that we find that varieties of the one species, as Professor Ruggles Gates (1948) has observed in the case of *Drosophila*, may be inter-sterile, while, on the other hand, a whole subgenus (as in the case of *Onagra*) or even a genus (*Rubus*?) may be interbreedable.

Professor Ruggles Gates (1948) has, in our view, very correctly pointed out that once inter-sterility occurs it will be the

beginning of speciation. For, if the two types cannot any longer interbreed they form two distinct mating "pools," and the mutations occurring in one will not affect the other, and so, as these different mutations accumulate, speciation will result in the end. But the fact of sterility itself does not indicate speciation. For, this would be tantamount to saying that a man and woman, physically sound, but mutually infertile, both of the same strain, were members of two different species, which would be a manifest absurdity.

Therefore, if sterility is no test, as such, of speciation, then neither is its converse, interbreed-ability, a test of belonging to the same species.

Professor Ruggles Gates (1948) has pointed out that the carrion crow (*Corvus corone* L.) and the hooded crow (*Corvus cornix* L.) are different species, in the time of the Ice Age being already segregated, but since they have met in Scotland, Eastern Europe and Central Siberia, they inter-cross.

In opposition to the general conclusion to which we have been led in our work, and those conclusions which we have here recorded from various writers, we ought, however, to refer to the fact that Dr. T. Dobzhansky, in particular, has been the foremost protagonist in our time for the concept that sterility is the test of species.

In pursuance of which, in regard to anthropology, T. Dobzhansky (1944) has abolished the genus of *Pithecanthropus*, promoted Java man to a species of *Homo*, as *Homo erectus*, and classified Neanderthal as merely a race of *Homo sapiens*.

These views, we consider, Professor Ruggles Gates (1948) has more than satisfactorily dismissed, by showing that "in *Drosophila* he is such an extreme splitter that he names a 'new species' where no morphological difference whatever exists whereas in man he out-lumps the lumpers, including anatomists and practically all anthropologists, by suffering genera which every anthropologist has recognised since the foundation of the genus *Pithecanthropus* by Dubois in 1894. Every biologist will recognise that there is something wrong with a principle which leads to such fantastic and contradictory results."

We believe that when we consider the wide difference in morphological form between the main stocks of living men, when we consider how the whole of the new techniques of blood groups, tasting, palmar prints, and so forth, can be interpreted in terms of those stocks, and how, in the light of anthropo-geography, each of these stocks can be rationally interpreted as having become specialised in almost or absolute segregation geographically, and, furthermore, how in the light of these foci, the present distribution of men can be interpreted, there is no other conclusion to be drawn than that we are dealing with specific groups in each case.

That's being so, we do not look upon all the primitive forms of mankind now known to us as ancestral to all modern men. Some of these are parallel developing genera, which became extinct. Others, which lie nearer in form, perhaps, are species nearly related which suffered the same fate. While others may have been ancestral species to this, or that, surviving species of modern man, but not necessarily of all.

How far back this parallel development in men commenced it is difficult to say. But, in our opinion, it is possible to have been *ab initio*, with that of the apes, and so each stock could be as distinct from each other, as they are all from the great apes. The speciation certainly occurred so early that the three species involved have led independent existences over a considerable length of time.

Inter-breed ability, so far as we know, has been preserved, although, as J. Deniker (1913) pointed out long ago, we have never really tested this adequately, and we simply do not know whether Lapps and Australoids, and Patagonians and Bushmen are really fertile when crossed and maintain their fertility generation by generation as the crosses are inbred.

Nevertheless, the fact that there is such an instinct in man as assortative mating, would suggest that there is a mechanism, even if not so fully developed as among most other living creatures, designed to keep the species of men segregated, and which, no doubt, has, in fact, largely achieved that

down to the present time, aided, or course, in the past by geographical segregation.

We cannot do better in closing this discussion than to quote once more Professor Ruggles Gates' (1948) own conclusion, on the same matter which is the same as our own.

"Since sterility fails as the criteria of species, we have to rely on the traditional basis of morphological difference in the discrimination of species, including man. We have already seen that many species and several genera of Hominoidae have existed in the past, and it is clear that we must apply to man the same criteria of species that we apply to the apes and monkeys. Consistency in nomenclature and methods of classification thus necessitates the recognition of several species of living man. Those who find this scientific procedure too great a shock can still fall back upon the time-worn *Homo sapiens* as a super-species embracing all the living species of mankind."

REFERENCES

- BOYD, W. C., 1950, Three general types of Racial characteristics, *Cold Spring Harbor Symposium on Quantitative Biology*, Vol. 15.
- DENIKER, J., 1913, *The Races of man*, London.
- DOBZHANSKY, T., 1944, On the Species and Races of living and fossil Man. *Amer. Jour. Rhy. Anthropology*, N.S., 2.
- GATES, RUGGLES., 1948, *Human Anestry*, Cambridge, Mass.
- HOOTON, E. A., On certain Eskimoid characters in Iceland skulls. *Amer. Jour. Phys. Anthropology*, I.
- HRDLICKA, A., Shovel-shaped Teeth. *Amer. Jour. Phy. Anthropology*, 3.
- LE GROS CLARK, Man's place among the Primates, *Man*, 35.
- MAYR, E., 1942, *Systematics and the Origin of Species*, Columbia University Press.
- , 1950, Taxonomic categories in Fossil Hominids. *Cold Spring Harbor Symposium on Quantitative Biology*, Vol. 15.
- MCCOWN, T. D. and KEITH, A., *The Stone Age of Mount Carmel*, Oxford Univ. Press, II.
- OSBORN, H. F., 1926, *The Evolution of Human Races*, *Nat. Hist.*, Vol. 26.
- SOLLAS, *Ancient Hunters*.
- WEIDENREICH, F., The Palaeolithic child from Teshik-Tash cave in Southern Uzbekistan (Central Asia). *Amer. Jour. Phys. Anthropology*, N.S. 3.
- WOODWARD, SMITH, The problem of the Rhodesian Fossil man. *Science Progress*, 16.
- WOOLARD, H. H., The antiquity of Recent Man. *Science Progress*, 33.