

THE ORIGIN OF MAN

Of all the sciences pertaining to Man it is the science of prehistoric man which has made the most sensational progress during the last fifty years. With this in mind it seems possible to construct a synthesis of all the facts known at the present time, in spite of the risks incurred by such an attempt. It is surely necessary at certain times to be rash, and in science as well as in life one must be willing to dare greatly, to act *dangerously*.

The problem of the origin of man is dominated by the question of monogeny and polygeny.

Did man emerge from the animal lineage which brought him forth in one single region of the earth, or did he appear either simultaneously or successively in various parts of the world independently? The facts as we know them today do not settle the question. However, the human phenomenon possesses such exceptional characteristics, demands such a combination of environmental factors, as to make its appearance in different parts of the globe unlikely. These environmental conditions, moreover, permit us to determine the zones where such an exceptional phenomenon could occur. It is clear that the primitive being from which man originated could not appear and survive except in regions where

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nature provided him continuously with the resources necessary for his existence. Only secondarily and by progressive adaptation could he establish himself in zones where this steady provision of the necessities was interrupted by the interplay of the seasons.

The sensational discoveries made in Europe have, quite naturally, directed the attention of scholars towards this continent and given rise to a veritable Western 'delusion'. Actually the importance of Europe with regard to the problem of man's origin was a result of the great number and the success of the excavations made there. Since the deeper layers of other continents have been probed—and this barely begun exploration has already led to extraordinary results—the concentration on Europe has gradually given way to a much wider conception of the whole problem, and Europe has properly resumed the modest place which is its due as a mere peninsula of the old continent.

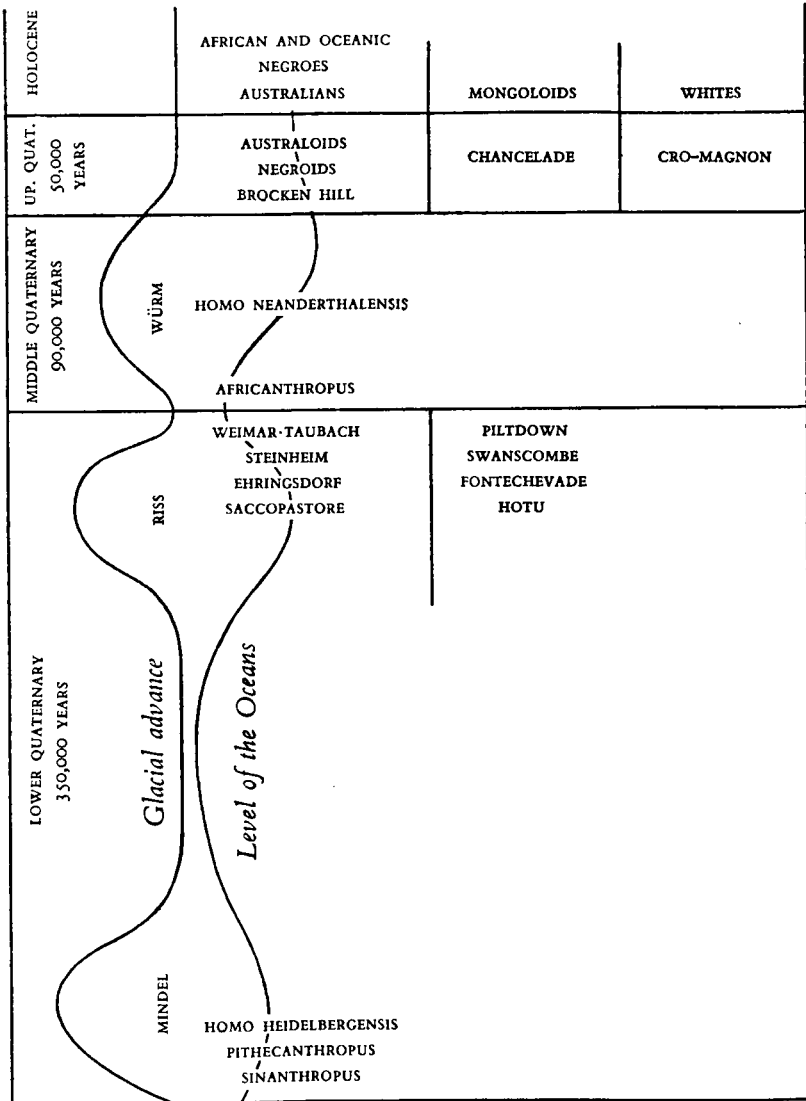
Thus the cradle of humanity must be sought in tropical and sub-tropical regions. Since it is now certain that America was not inhabited until late, the field of inquiry is restricted to the South Asian and African zones.

The choice between these two regions is in fact the issue dividing the majority of scholars. Given the present state of knowledge, southern and eastern Asia and the large islands of Indonesia have given us older evidences than South and East Africa. It is in the former vast region that we may be able to place man's first appearance and his centre of dispersion.

In order to avoid disappointments, it is well to remember that human evolution, like the evolution of all vegetable and animal life, has surely not followed an unbroken morphological line. Genetics has provided us with many examples of sudden changes, which are called mutations. There is no reason to believe that the evolution of man constitutes an exception, and consequently it is possible, if not probable, that the line of human descent does not display a continuous series of intermediary stages linking the different forms of its past history. In other words, it is possible that the evolution of our species resembles a staircase several steps of which are missing, or even that it includes only some stair-landings.

Another prefatory observation seems to me essential. The anthropologists of the past tended to place primary stress on migrations by land routes in prehistoric times. It seems to me, on the contrary, that transportation by water must have played a great and very ancient role.

As soon as men noticed a tree trunk afloat in the water, they surely tried to make use of this property of wood by fastening trunks together, constructing the earliest rafts. This invention had the advantage of sparing



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them the fatigue of travel on foot and affording shelter from the dangers of unfriendly nature. It permitted them to make use of the great river arteries and the sea lanes, on which they at first restricted themselves to a careful skirting of the coast before risking the crossings from island to island.

These are the premises which must in my view form the basis for any interpretation of the origin of man.

The date of the appearance of a being possessing those characteristics which permit us to regard it as a precursor of man is of course fairly uncertain. The tendency among geologists and students of prehistory is to place it further and further back. In the first edition of his book *Hommes Fossiles*,¹ Marceline Boule gives the figure of 125,000 years; in the fourth edition, published in 1952, we arrive at 500,000 years; and certain scholars do not hesitate to double this figure.

The appearance of man's ancestor coincides with the beginning of the Quaternary Age. We have indeed no data attesting the existence of Tertiary Man, though logically this would appear probable. In the half-million years since the beginning of the Quaternary Age, climate, and consequently fauna and flora, have undergone considerable changes. The study of these changes enables us to divide the Quaternary Age into three periods: the old or Lower Quaternary, with a mild climate, during which the hippopotamus, the elephant, and the rhinoceros inhabited western Europe; its duration is estimated at 350,000 years. The Middle Quaternary, with a cold and humid climate, during which our regions knew the mammoth and the rhinoceros with double-valved nostrils, lasted approximately 90,000 years; and the recent, or Upper Quaternary, distinguished by a cold and dry climate like that of the steppes, with the reindeer as the typical animal and a duration of 50,000 years.

These climatic variations were in large measure determined and temporarily modified by great glacial events.

The majority of geologists point out that during the Lower Quaternary there occurred two large glacial advances (called respectively *Mindel* and *Riss*) during which the glaciers extended furthest from the mountain centres of their origin, while the level of the oceans sank. This caused deepening of the river valleys below their present depth. This double glacial phase embraces a great interglacial phase marked by an encroachment of the sea upon the land, also (as noted above) by warm fauna.

¹Paris: Masson, 1921.

The Middle Quaternary, marked by a gradual return to a cold climate, brought a new and final glacial advance (called *Würm*). Its moraines are within the region bounded by the moraines of previous glacial periods, thus showing that the glaciers did not descend as far down as in previous periods.

In the Upper Quaternary the general and progressive retreat of the great glaciers modified the climate little by little until at the end of the period it was approximately the same as it is today. This brings us to the Holocene era.

During these three periods man lived, developed, and became differentiated. As far as we know today, there were two great lines of development; one of them continues throughout the ages and its centre of dispersion may be approximately determined. The other line, however, shows a gap of 90,000 years during the Middle Quaternary period, and neither its lineage nor its origin can be laid down precisely as yet.

The first line has its origin in Indonesia and East Asia and is represented by the Pithecanthropus of Java and the Sinanthropus of Choukou-Tien, near Peiping. These two beings are if not brothers at least first cousins, as is apparent in the clearly marked characteristics placing them between man and the anthropoids. They should be classified as nearer to the former than to the latter, since Sinanthropus made stone and bone tools and used fire.

Both of them had skulls elongated in the anterior-posterior direction, very much flattened vertically, with retreating foreheads and above the eyes a ridge resembling a visor. The cranial capacity of Pithecanthropus was 900 cc.³ that of Sinanthropus 1,000 cc.³, consequently intermediate between that of present-day anthropoids, 600 cc.³ and modern man 1,400 cc.³. Pithecanthropus varied in height between one meter 60 cm. and one meter 70 cm. while Sinanthropus reached about one meter 56 cm. on the average.

A creature of very similar type lived in East Africa at the very beginning of the Middle Quaternary called *Africanthropus njaransensis*; its remains were discovered by L. Kohl-Larsen on the eastern banks of Lake Njarasa in 1935.

Pithecanthropus, Sinanthropus, and Africanthropus, tended to develop forms of giant stature; the fossil remains discovered are known as *Meganthropus paleojavanicus* and *Pithecanthropus modjokertensis* of Java²; also the

² Weidenreich, F., 'Giant Early Man from Java and South China.' *Anthropological Papers of the American Museum of Natural History* (New York, 1945); XL, 1-134.

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Gigantopithecus Blackii of China³ and the *Meganthropus Africanus* whose remains were discovered in 1939 north of Lake Eyassi in eastern Africa⁴.

A further prosecution of this line must, in the present state of our knowledge, lead to western Europe. There excavations have brought to light beings more evolved and much nearer to man. They run through all layers of the Lower Quaternary: the Heidelberg man, almost a contemporary of Pithecanthropus-Sinanthropus, found in 1907 in a sand-quarry of the village of Mauer, with a lower jaw the bony part of which is more like that of the large apes than of modern man, though the teeth are plainly human; the Taubach and Ehringsdorf men found in 1914-16 and 1925 near Weimar; the man of Steinheim, discovered in 1933, north of Stuttgart; and notably the man of Saccopastore, represented by two skeleton heads dug up in 1929 and 1935 in a quarry near Rome—all these are clearly kin to the man of the Middle Quaternary.

This man of the Middle Quaternary, called *Homo Neanderthalensis* is well known at the present time, both as regards his characteristics and his distribution. He was of small stature (about one meter 55 cm.) extremely robust with a large skull, whose capacity is 1530 cc.³ for men and 1290 cc.³ for women, with very depressed vault, receding forehead, forming a thick transverse ridge above the orbits like a visor, a well developed face like a snout, without modelling, a large and prominent nose, a strong lower jaw lacking a chin, very large teeth (though these are definitely human) and short lower limbs indicating that this creature had surely not arrived at completely upright posture. He had a brain with simple convolutions and a relatively reduced frontal lobe with the base of the third left convolution so little developed as to indicate that he as yet possessed only a rudimentary articulated language.

Neanderthal man, in the period of the Middle Quaternary, inhabited an immense territory embracing southern England, the Anglo-Norman Islands, France, Belgium, the Rhineland, Wuerttemberg, Bohemia, Hungary, Spain, Italy, Croatia, Crimea, the Caucasus, Russia, probably Siberia, Galilee, Palestine, Morocco, and Java.

The discoveries in Java deserve our attention in the first place because

³Koenigswald, G. H. R. von., 'Gigantopithecus Blackii von Koenigswald, a Giant Fossil Hominoid from the Pleistocene of Southern China.' *Anthropological Papers of the American Museum of Natural History* (New York, 1952); Vol. XLIII, part 4, pp. 293-325.

⁴Weinert, H., 'Ueber die neuen Vor-und Fruehmenschenfunde aus Afrika, Java, China und Frankreich.' *Zeitschrift fuer Morphologie und Anthropologie* (Stuttgart, 1950); Vol. XLII, No. 1, pp. 113-148.

they include twelve skulls or fragments of skulls found at Ngandong in the valley of the river Solo between 1931 and 1933, and in the second place because of the character of these specimens.⁵ Solo man, of all the Neanderthal men so far uncovered, is the one most nearly resembling *Pithecanthropus* and *Sinanthropus*. Through him the link between the two former types and the large group of Middle Quaternary skeletons is best established. He seems to bear witness to a link whose discovery I predicted when I wrote in 1935: 'We should not lose hope that some day a successful search will reveal to us the existence of the Neanderthal tribe in India, Indo-china or Malaya.'⁶

The line of descent *Pithecanthropus-Sinanthropus-Homo Heidelbergensis*—*Homo Neanderthalensis* continues on all the evidence in Africa, into the Upper Quaternary with Broken Hill man (Rhodesia) who shows certain exaggerated features of the Neanderthal man while presenting a number of evolutionary traits. However from the time of the Middle Quaternary the line of descent on the African continent seems to result in types approaching that of the modern Australians; they have been called Australoids. Among these is the cranium from Florisbad, discovered in 1933 in the Orange Free State. In the layers of the Upper Quaternary these Australoid skulls become more plentiful in Africa as well as in Indonesia and Australia. Such are the skulls uncovered at Bayville near Port Elizabeth, at Mitskraal in the Cape Province, at Barkley West, near Kimberley, and at Cape Flats near the Cape; in Border Cave; near Ingwavuma in the Zulu country in Africa; the two skulls from Wadjak in Java; and the similar skulls from Talgai, from Cohuna and from Kailor, in Australia itself.

One step further leads us to the Australian type; its representatives have occupied all or a part of the South Asian continent. They have been found in the Neolithic layers of Tonkin, among the inhabitants of the two great prehistoric cities of the Lower Indus, Mohenhadaro and Harappe, which existed 2,500 years before Christ; the Munda and the Kohl (at present restricted to North India), who occupied a large part of the Indian peninsula before the Dravidian and Indo-European invasions, are near relatives of the Australians, and the influence of this substratum is still apparent among the populations of India as well as in Burma. In Australia the last

⁵Weidenreich, Franz., 'Morphology of Solo Man' (with an Introduction by G. H. R. von Koenigswald). *Anthropological Papers of the American Museum of Natural History* (New York, 1951); Vol. XLIII, part 3, pp. 201-290.

⁶'L'Origine de l'Homme.' *Les Cahiers rationalistes* (Paris, May, 1935); No. 41, p. 145.

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survivors of this large human group are rapidly disappearing before white colonisation.

The Australoid and Australian types take us straight to the Negroid type which appeared simultaneously in the Upper Quaternary in Europe, (Negroid type of Grimaldi) at Choukou-Tien, near Peiping, and, in the Neolithic period, at Tonkin.

The Grimaldi type left descendants in Western Europe among the populations of Brittany, Belgium, North Italy, Switzerland, Illyria, and the Balkans during the polished stone age, the Bronze Age and the Iron Age. It is found even among modern populations in the valley of the Rhone, in Piedmont, Lombardy, in the Province of Emilia, and in Tuscany. In North Africa it is found at Asselar in the middle of the Sahara in the basin of the former river-bed of the Tilemi—once a tributary of the Niger—at a time which corresponds to the end of the Upper Quaternary or the beginning of the Neolithic age. Just as the skeleton of Asselar establishes a landmark between the Negroid types of Grimaldi and the Blacks of Africa, the Quaternary or Neolithic Negroid types of South and East Asia who have left their descendants among the inhabitants of India—principally among the Dravidians and the inhabitants of Indo-China—are related to the Melanesians of Oceania.

Accordingly it seems to be possible, on the basis of our present knowledge, to forge a continuous chain from *Pithecanthropus-Sinanthropus* to the African and Oceanic negroes, the links of which are the men of Mauer, Weimar, Taubach, Ehringsdorf, Steinheim, Saccopastore, the Neanderthal man, the Australoids, the Australians, and the Negroid types.

All the facts make it credible that the migration of these races was undertaken by sea routes rather than by land. Having apparently started off from Indonesia, they reached Asia to the north, Australia and Melanesia to the south; while eastwards, skirting the southern shores of Asia, they crossed the Mediterranean and penetrated Africa. Let me add that it was also by the sea routes that the men of Oceania reached America; the Australians apparently skirted the shores of the Antarctic; the Melanesians took the transpacific route after having peopled all or part of the islands of this ocean in advance of the Polynesians.

Parallel to this line of descent, which has given rise to the black populations of Oceania and Africa, a second one, less continuous, less well marked, commences in the Lower Quaternary strata with the skulls of Swanscombe, Piltdown, Fontéchevade, and Hotu.

These skulls are all remarkable because their morphology shows that

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they are related to the skull of modern peoples, having nothing in common with the conformation of their contemporaries, the men of the Lower Quaternary. The skulls of Swanscombe and Piltdown come respectively from Kent and Sussex in England; the skull of Fontéchevade from a grotto in the Charente (France), and the Hotu skull from a cave in northern Iran. Though we know of the last discovery only through an article in a popular magazine⁷ the comparison with finds in Europe, obviously of the same period, seems justified. But while the lower jaw of Piltdown man shows great similarity with that of the chimpanzee, the mandible of the Hotu skull has the characteristics of a modern human mandible. We should note, however, that objections have been raised against considering as part of the Piltdown cranium the mandible found in the same layer.⁸ If the discovery of the Hotu skull is confirmed, it would signify an extension eastwards of that human type with modern characteristics which until now had only been found in western Europe. It would encourage the hope that future finds will take us even further towards the east, as was the case with the discovery of the Neanderthal skull at Solo in Java.

The trouble with this human line of descent, still so little known and so poorly represented, lies, on the one hand, in the impossibility, at the present moment, of forming an opinion on the place of its origin or determining the point on the line from Pithecanthropus–Sinanthropus at which it should be inserted—we are not even able to state whether there is such a point. On the other hand, we are confused by the fact that for the Middle Quaternary, that is during at least 90,000 years, we have no specimens permitting us to establish the lineage of these enigmatic men. Can we, despite this hiatus, connect them with the men of the Upper Quaternary? The answer is the more difficult to formulate, in that the Mousterian skulls discovered in 1931 and 1932 at Mount Carmel by D. Garrod and T. McCown, and in 1934 and 1935 in the grotto of Djebel Kafzeh, near Nazareth, by R. Neuville and M. Stekelis, exhibit the characteristics both of Neanderthal man and those of *Homo sapiens*. Accordingly it is possible that these men of the Near East mark a stage in the transformation from Middle Quaternary man to Upper Quaternary man. Only new discoveries will enable us to solve this important problem.

⁷'The discovery of earliest humans. Iranian cave yields bones 75,000 years old.' *Life* (Chicago, Sept. 10, 1951); Vol. II, No. 6.

⁸Marston, Alvan T., 'Reasons Why the Piltdown Canine Tooth and Mandible Could Not Belong to Piltdown Man.' *British Dental Journal* (London, July 1, 1952); Vol. 43, No. 1.

Be that as it may, the Upper Quaternary, which began about 60,000 years ago, plunges us headlong into modern humanity. I have already spoken of the Negroid type of Grimaldi having its place in the first line of descent that I studied. Two other types are close to this one, the Cro-Magnon type which is undoubtedly connected with the white race, and the Chancelade type presenting pronounced Mongoloid features.

Both of these types are found in Europe as well as in Asia. Cro-Magnon man and his variations peopled Western Europe including the British Isles, the Spanish and Italian peninsulas, Hungary, Poland, Moravia, North Africa and perhaps also South Africa (Boskop skull) on the one hand; and on the other hand, eastern Asia, where Weidenreich found him represented in the Upper Quaternary layers of Choukou-Tien associated with a mongoloid type and a negroid type. Chancelade man has up to now only been found in France, in the neighbourhood of Perigueux, in the Charente, and perhaps in Germany (skull of Oberkassel); also in eastern Asia (layer of Upper Quaternary at Choukou-Tien).

The presence of these two human types in both Europe and Asia at the same geological epoch leads us to suppose that they too sprang from an intermediary geographic region, which might be the same one whence issued the line of descent of Pithecanthropus-Sinanthropus-Negro. It is probable that these immigrants, unlike the latter, used the land routes. At least for the Mongoloid type, it seems possible to trace approximately the route of this migration.

The students of pre-history have long remarked the resemblances between the civilisation of Quaternary Man and that of the Eskimos. Furthermore there doubtless exists a cultural affinity between the Eskimos and the modern races of the Sub-arctic, the Chukchi, the Yakutz, the Samoyeds, and the Lapps. These resemblances are in line with the important linguistic fact of the kinship of the Eskimo language and the Ural-Altaiic tongues. As it is clear that all these races could only gradually adapt themselves to an Arctic climate we have every reason to believe that originally they lived in milder, that is to say, more southerly regions. In 1932 Wilhelm von Hevesy drew attention to the strange similarities between the Ural-Altaiic languages and the Munda language of India, which itself is related to the Australian languages. All these facts lead me to suggest that the proto-Ural-Altaiic peoples, issuing from India, left this region, and moved north and north-east adapting themselves little by little to more and more inclement climate. The Mongoloid type of the Upper Quaternary of Choukou-Tien would be evidence of their penetration of the east of Asia.

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Once arrived at the Arctic Circle, these emigrants would have spread out both eastwards and westwards and become the ancestors of all the races living around the Pole in Asia and Europe. The Chancelade man would bear witness to their arrival in Europe from the time of the Upper Quaternary, and the Eskimo would represent the easternmost swarm of these Asiatic migrations whose first groups reached the New World by way of the Behring Straits and the ring of the Aleutian Islands at the end of the Quaternary period or the beginning of the Neolithic age.

One may guess that Cro-Magnon man, whose remains are akin to those of a Mongoloid type at Choukou-Tien in the layers of Upper Quaternary, came by a similar route, though it is not possible in the present state of our knowledge to marshal any arguments for this view as convincing as the ones put forward in favour of a Mongoloid migration. This hypothesis might explain the white affinities of the Ainu⁹ as well as the presence in the New World of a white and bearded component whose origin cannot be found either in the Asiatic or the Oceanic tributaries now admitted to have had their share in the peopling of the American continent. It might equally well explain a similar element among the Polynesian race, which the ethnologists agree had its cradle in India or a neighbouring region.¹⁰

To sum up: though the first line of descent of the human race appears coherent the second line is, as it were, still in the air, without a root or a culmination. It follows that at the moment there is no foundation for the theory that the men of the Upper Quaternary (Cro-Magnon and Chancelade) issued from this second line or from one of the types of the first line of descent (Neanderthal man of the Near-East). This is one of the problems which the future will doubtless help to solve. At the moment the indispensable documentation is lacking for the formulation of an acceptable hypothesis.

As is true of all branches of science, the study of the origin of man calls for daring, but, no less, for patience and hope.

⁹Montandon, George, *Au pays des Ainu. Exploration Anthropologique*, Paris, 1927.

¹⁰Poirier, J. *L'élément blond en Polynésie et les migrations nordiques en Océanie et en Amérique*, Paris: Société des Océanistes, 1952.