CHAPTER –13

HOMO SAPIENS SAPIENS: HOMO SAPIENS DURING UPPER PLEISTOCENE

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THIS chapter is devoted to discussion on anatomically modern humans, taxonomically called Homo sapiens. Earlier we have noted that in some areas evolutionary developments led to the production of early archaic Homo sapiens populations exhibiting a mosaic of Homo erectus and Homo sapiens traits. In some regions the trend exhibiting Homo sapiens characteristics continued. However, in Africa there appeared transitional forms between early archaic and anatomically modern forms.

IN ANY case the disappearance of the Neanderthals from Europe and Asia may have had much to do with the appearance of the early modern Homo sapiens sapiens, who are believed to have competed with the Neanderthals for resources. These first modern humans were anatomically distinct from Neaderthals as their brow ridges were less prominent; skulls were higher shorter and more rounded; the lower jaws were also shorter with a bony chin and they had a taller and less robust skeleton. Their pubic bones were of modern types suggesting that the hip joint functioned like those of modern people. In view of the nature of evidence and on going ambiguities in dating it is not possible to say exactly when anatomically modern Homo sapiens first appeared. But the transition and the wide dispersal of Homo sapiens sapiens in the Old World appeared to have been relatively rapid evolutionary events. Therefore, such questions-as when did Homo sapiens sapiens first appear? Where did the transition take place- was it in one region or several regions? How quickly did the transition occurred? How did the dispersal of Homo sapiens sapiens to other areas of the Old World take place? continue to haunt us.

IN ANY case it appears certain that by 40,000 years ago modern humans (Homo sapiens sapiens) seem to have been the sole occupants of the region. The spread of modern people into Europe probably occurred at about this time. There is some evidence to indicate differences between Neanderthals and early modern people also referred to as the Cro-magnon after the discoveries at cro-magnon in France in1868. It is noted that most Neanderthal fossils have been reported with middle Palaeolsthic or Mousterian industries, the Cro magnon on the other hand are invariabley associated with upper Palaeolithic industries such as the Aurignacian, Perigordian, Gravettian, Solutrean and Magdaleinian. These upper Palaeolithic cultures are quite variable in time and space and include many blade tools some of which were specialized for working on bone, antler and ivory. Such raw materials although available to Neanderthals were hardly used by them.

THUS Modern man seems to have been in evidence almost all over the Old World by the time of fourth glaciation. It is necessary to know the principal fossil representatives of man during the last glaciation; and how they were different from or similar to modern man particularly in Europe from where most of the fossil material has been recovered.

THE first well preserved skeletons of Aurignacian period were discovered in 1868 in the little village of Les Eyzies which lies in the valley of river Vezere, a northern tributary of Dordogne in Perigord in South Central France. This site has yielded the richest and most varied remains of Pleistocene man who lived in the caves and rock shelters. The Mousterian Neanderthaloids lived in the same dwelling places which were later occupied by their successors - the man of the Aurignacian, Solutrean and Magdalenian periods. They evolved their industries, developed their art of realistic painting, sculpture and engraving on stone and bone. The type sites of these two periods, the Mousterian and the Magdalenian, are located in this valley.

CRO-MAGNON MAN

IN 1868 M. Louis Lartet excavated the rock shelter of Cro-Magnon on the banks ot Vezere in the village of Les Eyzies. This site has yielded several human skeletons. There were strata containing hearths and implements of the Aurignacian cuiture. The human remains were recovered from the highest strata of the deposit. This material consisted of a skull and some other bones of an old man and parts of the skeletons of four other individuals at a short distance from the old man's bones. These skeletons indicate the type of man that seems to have inhabited various places in Western Europe throughout the three upper palaeolithic cultural periods. These skeletons exhibit features quite similar to modern man. It is proposed to consider the bones of the old man of Cro-Magnon as the type specimen of the group.

THE skull is massive and large in every dimension. Its length is 20.3 cms and breadth 15.0 cms. The height above the ear holes works out to 13.2 cms. The skull is Dolichocranial with an index of 73.7. It exhibits a pentagonal contour possibly owing to the marked projection of parietal mass. Some anthropologisits refer to it as Dolicho-pentagonal form. On the basis of the dimensions of skull the cranial capacity works out to 1660 c.c. This is about 150 c.c. more than the modern European average. The forehead is broad and of moderate height and so also are the brow ridges. The occiput bulges behind and has a marked flattening in lambdoid region. The skull is broad across the middle of the parietals. The face is relatively flat and very broad while the skull is narrow and long. This combination of a short broad face with a long narrow head is known as cranial disharmony. The orbits are extremely broad without rectilinear margin forming a quadrilateral outline. Owing to shortness of the face the orbits are very low. The cheek bones are large and protruding, nose is narrow, long and high (i.e. Leptorrhine). The maxilla exhibits pronounced prognathism. The alveolar border is prognathous. The palatine arch is that of medium size and narrow. The teeth are not extraordinary. The lower jaw is robust and that of modern conformation. The chin is prominent.

THE long bones indicate a stature of slightly over 5 feet 6 inches. Forearms are long in comparison to upper arms. The shins are longer in relation to thighs.The proportions of the limbs are referred to as Negroid proportion and they are not usual in modern Europeans. However, they have been noted frequently in the taller groups of the American Indians and in other races not considered Negroid. Another important feature is a type of flattening of the thigh bones called Platymeria and also side to side flattening of the shin called platycnemia. This is attributed to the habit of walking with the knees bent on unlevelled ground. The muscular impressions are strongiy marked. The femora are strongly bowed and have developed *linea aspera.* Pilaster is also present.

SKELETONS attributed to Cro-Magnon have been reported from Solutre, four miles West of Macon in East Central France. This is the type site for the Solutrean period of the Palaeolithic age.

HOOTON has pointed out that on the basis of the original old man of Cro-Magnon, the French anthropologists refer to a race called 'Cro-Magnon race' and attempted to fit into the Cro-Magnon type almost all finds of modern man belonging to late Palaeolithic period. However, in this are included certain long headed but broad faced type of men who are believed to inhabit Dordogne, France and are believed to be the direct lineal descendents of ancient Cro-Magnon cave dwellers. Hooton, however, disagrees because the type referred to is very short in stature whereas the Palaeolithic men were supposedly of great height. Quatrefages and Hamy referred to the existence of Cro-Magnon descendents in Dalecarlia,

southern Sweden who form a special group known as 'Dal Race'. This type has also been subsequently reported from various regions of Germany. Many individuals from these areas display a series of features corresponding to those found in descendents of Cro-Magnon race. Broca has noted the presence of structural affinities among the Basques, the Kabyles and the Guanchos (inhabitants of Canary Islands on the western coast of Africa). Danikar refers to the Cro-Magnon type as dark Mesocephalic tall race called Atlanto-Mediterranean, which currently may be observed along the Atlantic and Mediterranean sea coasts of the Iberian peninsula. However, the Guanchos of Canary Islands best represent the Cro-Magnon type.

THUS, in general, the morphological characteristics of Cro-Magnon man suggest that he belongs to *Homo sapiens* with several distinctive characteristics. Many scholars believe that European upper Palaeolithic man exhibited a wide range of skeletal variation in their form as represented by the remains of Chancelade, Grimaldi, Predmost, Combe-capelle, etc.

COMBE CAPELLE

IN THE year 1900 traces of fossils were recovered from combe capelle. This area also belongs to southern France which yielded Cro-magnon. This fossil material includes an skull with a long face, high forehead , high vault and strongly developed long brow ridges. The lower jaw is also strongly built. Some of the researchers consider it as an intermediate form between Neanderthal and Modern man.

CHANCELADE MAN

THE name is derived from a rock shelter near Chancelade where the discovery was made on Oct. 1, 1888. Chancelade is four miles from Perigueux and lies in the centre of the Dordogne region of South Central France. The deposits on the floor of the rock shelter were 5 feet 4 inches in depth and yielded the typical fauna and implements belonging to the Magdalenian period.

THE skeleton lay on its left side in the deepest stratum with its arms folded on its breasts and knees doubled up against the body. The body was powdered over with red ochre (this type of burial is practised by Eskimos). The skeleton is believed to belong to a man between 55 and 65 years of age. The stature was short. According to Keith it was 5 feet 2 inches. The limb bones were very robust and fragmentary.

THE skull of the Chancelade man resembles the crania of modern Eskimos. It is long and narrow (length 19.4 cms and breadth 13.5 cms) with a cranial index of 70.9. Supraorbital ridges are slightly developed with forehead bulging and rising vertically. The parietal eminences are marked and mastoid processes are well developed. The vault is high with its maximum basion-bregma height as 14.9 cms. The cranial capacity as estimated by Keith is 1530 c.c. The occiput is steep behind as in Brachycephales.

FACE is long and moderately broad. The cheek bones are prominent and strongly developed which give a flat appearance to the face. The nose is long and narrow and the nasal bridge is broken. However, on the basis of the photograph of the skull Keith claims that it is high and long and at an angle never seen in Eskimo crania or in typical Mongoloid faces. The lower jaw is narrow and strong with broad ascending ramii, chin is prominent. The jaws do not flare outward as in Eskimos. Most of the upper teeth have been lost from wear and disease. The lower teeth are not very large, molars seem to be powerful and increase in size from first to the third. In modern man the third molar is smaller than the other two.

THE post-cranial skeleton indicates that long bones are strong and massive. The muscular impressions are well marked indicating a muscular body. The upper limbs are longer unlike modern Europeans. Femur is slightly bent, *linea aspera* is well developed like Cro-Magnon. The shaft of the tibia has a flattening in the transverse direction and is slightly platycnemic. Foot is large, with first metatarsal distinctly separated from second toe, like in Neanderthal man.

TESTUT, who examined the skeleton, has shown its resemblances with Eskimos. These resemblances are based on the combination of short stature with a capacious dolichocranial skull, a fairly long and broad face, narrow nasal aperture, strongly developed masticatory apparatus, flat face marked by squared cheek bones, and presence of a medial ridge like elevation of the skull roof. On the basis of these similarities and cultural similarities like the use of bone tools, needles, harpoons and bone engravings, etc. it has been claimed that the Magdalenians, following the retreat of the ice sheet northwards at the close of glacial age, eventually reached North America and thus are the ancestors of modern Eskimos. However, this view has not been fully accepted. Hooton argues that the resemblances exist but these are like many Eskimo features found in the skulls of twelfth century icelanders of Norwegian and Irish origin. However, the possibility of a Mongoloid admixture in the man of Chancelade cannot be denied. Keith, on the other hand, has suggested that Chancelade is a European type. Many scholars are of the view that it is another variety of European upper Palaeolithic man — like Cro-Magnon —but of much lower stature.

GRIMALDI MAN

GRIMALDI fossil remains are referred to European Upper Palaeolithic. The discovery was made in a cave near Mentone in Italy. In the Italian Riviera, just across the French frontier, there are red rocks of Grimaldi on the sea coast. On the cliffs of these rocks there are many caves where upper Palaeolithic man lived. In one of the caves, called Grotte des Enfants. two skeletons were found in June 1901. Professor Verneau considered these skeletons as of Negroid type. The name of the cave seems to have been given on the basis of the skeletons of two children found in its upper strata. The excavation brought to light many habitation sites which were marked by hearths, implements and other evidences of human occupation. On the basis of faunal evidence (reindeer bones) they are referred to Pleistocene age. At the level of the second hearth from the top was located the skeleton of an old woman and at a depth of 9 feet were found the skeletons of two children. And in still deeper deposits about 23 feet below the surface was found the skeleton of a tall man. Verneau examined the skeleton of the tall man and assigned it to the Cro-Magnon type. The stature is estimated as 6 feet and 2-1/2 inches. The skeleton of this man was found lying on its back with a slab of red clay under his head and large stones around his feet. The associated implements refer to the Aurignacian culture.

AT A depth of about 29 feet and at the level of the oldest hearth was found a grave containing two skeletons, belonging to an old woman and a boy of about 15 years. The old woman was buried with her arms doubled up under her chin and her knees flexed against her abdomen. The position of the skeleton suggests that she was lying on her right side. The boy's skeleton was slightly above and on to her right. The child's skeleton was in a loosely flexed posture with arms half bent and doubled up legs at right angles to the axis of the spine. The skeletons were stained with red ochre and the implements around the burial were of Aurignacian culture. It seems that they refer to the beginning of the Aurignacian culture.

ON THE basis of cranial morphology the Grimaldi skulls are believed to have Negriod features. Both the skulls are long, narrow and high. Length of the female skull is 19.1 cms, breadth 13.1 cms and height 11.5 cms. The brow ridges are feebly developed as in the Negroid crania. The forehead is straight and well developed and slightly bulging.

THE skulls present a regular elliptically shaped contour with flattened parietal eminences. The cranial indices of old woman and of the adolescent boy are 68.5 and 69.2 respectively. The cranial capacity according to Keith works out to 1454 c.c. in case of the young boy and 1265 c.c. in case of old woman (using Lee-Pearson formulae). Verneau, however, estimates a cranial capacity of 1375 c.c. in case of the woman and 1580 c.c. in case of the boy. The mastoid processes are small.

THE face in both the cases is rather narrow and short. However, it must be noted that the boy was in his adolescence with jaws not fully developed. The orbits are very low in comparison to their breadth as in Cro-Magnon. Nose is depressed at the root, the bridge is low and broad and nasal aperture extremely wide. The nasal index in case of female is 63.6 and in case of boy 54.3, suggesting that the nose is platyrrhine. The canine fossae are very deep (a Negroid feature). The alveolar margins in both the skulls are swollen and prognathous. The palatal arch is slightly developed in breadth and is very deep. The lower jaw is strong with its body very thick, the ascending ramii are broad and low. The chin is not greatly developed. A strongly marked prognathism correlated with the prognathism of the upper jaw give's it a receding appearance. Most of these cranial and facial features are Negroid.

THE old woman has lost most of her teeth but in case of boy they are well preserved. His palate is long, narrow, high and U-shaped as in modern Australian natives. The teeth are also large, the upper molars have retained four cusps whereas the lower molars have five cusps like those of Australians.

GRIMALDI skeletons exhibit Negroid features in the proportion of limbs. The forearm and the leg are very long in relation to the upper arm and thigh respectively. Verneau recognized that in vertical projection of the iliac bones, in the strong curvature of iliac crest and in reduced dimensions of greater sciatic notch the pelvis of old woman differs from that of the modern European female and resembles that of Negroes. The shaft of the femur has a pronounced curvature and is strongly bent. Tibia exhibits a certain amount of retroversion of the head. The projection of the heel bone again indicates Negroid features. The estimated stature of the woman works out to 5 feet 3 inches and that of the boy 5 feet 1-½ inches.

THE Grimaldi material is believed by many anthropologists as definitely Negriod and they are commonly accepted as a good evidence of Negroid race in Europe duringAurignacian times. However, on the basis of the actual study of the material many others disagree with this view and feel that they are simply variant of the Mediterranean race now inhabiting Southern Europe. Boule and Vallois maintain that the Grimaldi skeletons represent a human type which is comparable to the modern Negritic or Negroid type. According to them the Grimaldi exhibit resemblances to South African types, the Bushmen and Hottentots, in terms of similar Dolichocephalic characters, same prognathism, same flattening of the nose, same development of facial breadth, similar form of jaw and the great size of teeth. The differences, however, are in terms of the stature and height of the skull.

IN THE opinion of Hooton, the so called Negroid features of the Grimaldi merely constitute a part of the primitive complex of the so called Cro-Magnon man. The efforts to identify the Grimaldi material with Bushmen of South Africa and Hottentots are interesting but not altogether convincing. The common possession of some of the Negroid characters in the Grimaldi together with similar Aurignacian stone industry with that of the Bushmen perhaps

is the basis for the observation that Bushmen are dscendents of upper Palaeolithic artists of Europe. Elliot Smith amd Arthur Keith, on the basis of their independent research work on the Grimaldi skeleton, have concluded that the Grimaldi merely represent the primitive type of Cro-Magnon stock and the Negroid resemblances may be just a coincidence.

IMPORTANT DISCOVERIES AND SITES FROM OTHER AREAS

SEVERAL upper palaeolithic human fossils have been reported from central and eastern Europe, Africa, Asia and Australia. Of these the most important ones are given below:

PREDMOST

PREDMOST is the site where between 1890 and 1928 were discovered the skeletal remains of over 40 individuals.These remains are thought to be 30,000 years old. Two skeletons identified as males and females and sequentially numbered as iii and iv respectively, exhibit a mixture of primitive and progressive features. These skulls are low with prominent supraorbital ridges and small chin.

IT WAS in 1888 that skeletal remains of similar types were also found at Brunn, some fifty miles West of Predmost. Later on in 1891 a skull and in 1927 another skeleton was discovered. The cultural artifacts found in association with the skeletal remains belong to late Aurignacian and early Solutrean period.

THE morphological characters of Predmost man reveal that the mean cranial capacity was 1590 c.c and they were about 5'-7" tall. A number of characterstics like the development of supra orbital ridges, preauricular height of the skull suggest Neanderthal- Cro-magnon ancestry, of which Cro-magnon type predominates. Predmost skull also reveals certain Negroid or Australoid traits such as its flat sided, long narrow and high form. Prognathism is also present. Such characters have also been found in the male skull of Combe capelle. It seems that Predmost was contemporary of later Neanderthals.

BOSKOP

IN AFRICA several early fossil finds have been reported and interpreted as fully anatomically modern forms. These specimens were recovered from the Klasies river mouths on the south coast, Border cave slightly to the north and Omo Kibish in southern Ethopia. Most of these sites have been dated to about 120,000-80,000 y.a..However, more significant finds have been reported from south Africa , Cave Flats and Border Cave.

BOSKOP man was discovered in South Africa near Transvaal in 1913. He had a remarkable great size of the brain case with a cranial capacity between 1800c c—1900 c.c. The forehead is bulbous and brow ridges not very large and pronounced. The face was little prognathous is indicated by the fragment of the lower jaw. Some scholars believe that Boskop man was the ancestor of South African Bushmen.

ASSELAR MAN

A TEAM of French Scientific Expedition discovered the skeletal remains in 1927 in the middle of the Sahara desert about 400 km from north-east Timbuctu.The name Asselar refers to a French Garrison Coast.

THE Asselar skeletal remains were discovered from the dry bed of the river Tilmesi.The Asselar man was tall and slender with a long and high skull. The face was broad and of

medium length. The frontal bone is bulbous with moderately developed brow ridges. Unlike modern man the nasal bones were fused throughout their length. They were narrow with a broad nasal aperture. The ramus of the lower jaw was broad and chin developed.

WADJACK MAN FROM JAVA

THE literature indicates that during 1889-1890 several skulls were discovered at a place called Wadjack in central Java. However, Dubois reported on the Wadjack material in 1920. The cranial skeletal material indicates that Wadjack man had big brow ridges, receding forehead. The cranial capacity of male skulls is estimated as 1650 c.c and that of females as 1550 c.c. Some scholars have tried to relate Wadjack skeletal material to the ancestry of Australian aborgines.

ORIGIN OF HOMINIDS

AS REGARDS the origin of Hominidae the most intriguing question in the whole evolutionary story is : what was the ultimate origin of man ? Or to put it differently, at what stage in geological time did the Hominidae fmally segregate from other groups of Primates and what was the nature of ancestral stock from which the segregation occurred? Unfortunately the palaeontological record is still incomplete. We have considered only the most significant fossil types representing different stages in the evolution of Hominidae leading to the emergence of Homo. The gradational series of types of modern *Homo sapiens,* early Mousterian. and Acheulian man, *Homo erectus* and Australopithecus comprise a retrospective morphological sequence and a receding temporal sequence (Clark 1972:174). In a way they provide satisfactory evidence for our tracking down the ancestral lineage to the phase of human evolution to which the term 'human' can hardly, be applied. In this phase possibly the brain was little greater than the modern Anthropoid apes and the jaws were massive and protruding. But it appears that this phase must have been well advanced beyond the initial origin of the Hominidae, possibly much after the evolutionary segregation from the Pongidae. We have noted that many characteristic features of the Hominid skull and dentition were established by the australopithecine phase. In the limb skeleton also there was considerable adaptation to erect posture and gait. For a common ancestral stock, this however, could not be postulated on the basis of comparative anatomical evidence. The record of human evolution indicates the gap which separates Australopithecus from the fossil Hominoids of Pliocene and Miocene times. So far no fossil Hominids have been found which can be assigned to an antiquity greater than the early Pleistocene. As regards the Pliocene Hominids, which must have existed, we do not have any fully dependable fossil evidence except that of Ramapithecus. However, fossil evidence of Anthropoid apes from Pliocene and Miocene deposits of the Old World is widely known.

THE extinct Hominoids of Pliocene and Miocene age from Europe, India and Africa are known only from teeth and fragmentary jaws. The dentition and mandible of these early Hominoids were less specialized than in recent Pongids. However, Ramapithecus, the Pliocene Hominoid from Siwaliks of India - with small sized teeth and relatively simple construction of the molars - seems to closely approximate to Hominidae[1].

1. The basis of this approximation are the characteristics like flattened wear of the premolars and molars, the bicuspid nature of the premolars, small size of canines, the origntation of the long axes of their alveoli and their medial position in the lower dentition, moderate degree of anterior conversion of the teeth rows to form a parabolic dental arcade, the absence of a pronounced diastema and the relatively low degree of prognathism suggesting a sort of transitional phase in the evolutionary derivation of the Hominid type of dentition from the known Pliocene and Miocene apes.

ON THE basis of the total morphological pattern Simons (1961) even feels that this genus should be assigned to Hominidae than to the Pongidae. A similar evidence of Ram-apithecus has also been reported from Kenya, East Africa by Leakey who named it as Kenyapithecus.

APART from the dentition it seems that some authorities have been reluctant to accept the suggestion that the evolutionary precursors of Hominidae could be represented by any of the known Miocene or Pliocene genera of apes (as their dental characters indicate Pongid status). As regards their limb structure the palaeontological evidence indicates that the limb structure of these extinct apes had certainly not developed the extreme and aberrant specializations of the modern anthropoid apes particularly related to the extreme form of brachiation. On the other hand it seems that they were like quadrupedal Cercopithecoid monkeys of today. These observations demonstrate that in so far as the proportion and structural adaptations of the limbs are concerned there is no theoretical objection to the derivation of Hominidae and the recent Pongidae from a common ancestry by early or middle Miocene times or even later. Possibly only subsequent to this the divergent evolutionary development of characteristic growth rates of the limb and trunk in the Hominoidea must have marked the initial phylogenetic separation of the earliest precursors of the Hominidae and Pongidae.

THUS the factors which determined the segregation of evolutionary radiation of Hominidae can only be surmised. There is no reason to suppose that the Miocene and Pliocene apes were not arboreal creatures except *Proconsul major* which was equivalent in size to modern gorilla. The adoption of bipedal terrestrial habit by the earliest representatives of Hominidae must have occurred in regions of deforestation. Possibly the environment of East African Miocene apes provided such a possibility. Leakey, on the basis of his evidence based on fossilized fruits, seeds and insects from the Miocene deposits of Kenya, has suggested that the environment consisting of wooded valleys of limited extent, separated by open Savanna country must have provided condusive situation for the evolutionary adaptations of ground living forms in the ancestry of Hominidae. They must have tried to retain the arboreal life yet adjusting with the changed situation consequent to gradual deforestation.

THUS it seems well settled on the basis of evidence at present that the Hominidae and the Pongidae must have originated from a common ancestral stock. The interpretation of palaeontological evidence of Hominid evolution as presented in the foregoing pages can be taken only as a provisional one. Accumulation of more evidence may certainly change our interpretation and bring out the truth more concretely in near future.

IN ANY case it seems almost certain that Cro-magnons and other anatomically modern people who exclusively swayed in the world 30,000 years ago were endowed with a full sized brain and possessed a physical appearance some what similar to our own. It seems that the modernization of the face of upper palaeolithic man is a consequence of the reduction in the size of the teeth and muscles involved in chewing, as teeth were no longer required to be used as tools. Along side , bodies became some what less massive and robust on account of improved technology which did not require brute strength . The emphasis in evolution of the genus Homo throughout the world was on increasing cognitive capacity through development of the brain.

IT SEEMS this progression took place irrespective of environmental or climatic conditions. Smoothening of the genetic differentiation in todays human populations speaks of high level of gene flow between populations in the past.

UPPER Palaeolithic cultures evolved out of the Middle Palaeolithic cultures of Africa, Asia and Europe. Its typical tool was blade .The cultural adaptation of upper Palaeolithic peoples became specific; they developed different tools for different seasons, and people living in different environments probably produced different cultures. The end of the glacial period also must have caused great physical changes in human habitats. Sea levels were raised vegetation changed and herd animals disappeared from many areas. The European Mesolithic period marked typical Hominine ways of subsistence. There was increased reliance on sea food and plants.