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PHYSICAL ANTHROPOLOGY

Block

4

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BLOCK 4 BIOLOGICAL DIVERSITY

Introduction

Human beings across the world differ from each other in their physical and morphological features. All individuals differ from all others, if a wide enough variety of characteristics are considered. Even within limited breeding populations, individuals differ in the colour of the skin, eyes and hair, the form of the head and face, the shape of the nose, the form and quantity of head and body hair and the proportions of the body. However, the same criteria that separate some human groups may unite others. It is often advantageous to apply the adjective 'racial' even though there be no discrete boundaries to any category to which one can apply the noun 'race'. Racial characteristics are certainly genetic entities, although the mechanism of their inheritance is not always fully known and they may be modified by non-genetic influences.

European scientists and Physical anthropologists proposed different classifications of mankind based on observable traits essentially codifying the perceived differences among broad geographic populations such as Caucasoid, Mongoloid, Negroid and Australoid. Race is genetically divergent among human populations which are marked by common phenotypes. Although all human beings belong to same hominid species, Homo sapiens sapiens, the diversity among these people are formed by a complex biological process through micro-evolutionary factors such as mutation, natural selection, genetic drift, migration, isolation, hybridization, sexual selection and social selection. The various ethnologists have classified human races differently and out of this, classification of Deniker, Hutton, Coon, Garn and Birdsel, Ottenberg, Wiener, Boyd and Ashley Montagu are most important. The physical characteristics of the major races (Caucasoid, Mongoloid, Negroid and Australoid) vary in respect of skin colour, hair form, head form, face, eye, nose, lips, stature, blood group and dermatoglyphic features. Out of many classifications, some classifications used skin colour; some emphasised hair form; most relied on a series of readily observed traits, usually including skin pigment, hair and superficial features such as head and face form and body size. Thus the major race called as 'Caucasoid' that originated in the Caucasus Mountains, have light skin, variable hair and eye colour and relatively high narrow noses. The Mongoloid is defined by coarse black straight head hair; scant beard and broad flat face with projecting cheeks, epicanthic or mongoloid fold (almond-eye appearance). The Negroid is characterised as having brown skin, black woolly hair, broad flat nose and thick lips. The Australoid are characterised by dark wavy hair, abundant body hair, dark skin, low forehead, relatively broad nose and thick lips.

A pool of inherited characters of any human population changes from time to time. Many biologists question the value of the concept of race and Montague in 1951 has suggested the complete suppression of the term for serious scientific discussions. The chief reason for the attack on the notion of race is that the concept has been much abused by persons who would emphasise human differences for the sake of maintaining a superior economic and social position. Thus it can be said that race is simply a cultural construction. All these have been dealt very informatively and systematically in this block on Biological Diversity which has four units.

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UNIT 1 CONCEPT OF RACE

Contents

Learning Objectives

Once you have read this unit, you will be able to understand the:

- concept of race;
- early racial classifications;
- typological approach and genetic classification of races;
- contemporary thought on races;
- concept of cline; and
- causes of biological diversity.

1.1 INTRODUCTION

Human geographical variability is manifest on a continental basis with usual division of our species into races or ethnic groups. For instance, we rely on the simple visual appraisal to determine the distinctions between various groups; especially differences existing in the colour of the skin. People range in pigmentation from a very pale colour as in the North Europe to extremely dark brown as in the African Congo or New Guinea. Human stature also ranges widely from the four-and-a-half foot Pygmies in West Central Africa and Oceania, to the six-and-a-half-foot Nilotic peoples of East Africa. Hair form, another trait that attracts a great deal of attention, varies from straight and long as in the Japanese to short and spiral shaped as in the Africans. Further, the size and form of the human face differs considerably throughout the world, and the proportions of the lower limbs and the trunk vary over a broad range. Many more subtle differences between human populations, such as those in the frequencies of different blood groups, types of blood enzyme and protein polymorphisms and DNA markers also exist, although they require special techniques to be determined.

1.2 DEFINITION OF RACE

Hooton (1926) defined race as a great division of mankind, the members of which, though individually varying, are characterised as a group with a certain combination of morphological and metrical features, primarily non-adaptive, which have been derived from their common decent. Montagu (1942) defined race or an ethnic group as representing number of populations under species *Homo sapiens*, which individually maintain their differences, physical and cultural, by means of isolating mechanisms such as geographic and social barriers.

As early as 1944, Dobzhansky provided a genetic definition of human race. According to him "Races are defined as populations differing in the incidence of certain genes, capable of exchanging genes across boundaries that separate them". Later he gave a somewhat different definition i.e. "Races are genetically distinct Mendelian populations. They are neither individuals nor particular genotypes who differ genetically among themselves" (Dobzhansky, 1970). In his opinion the traditional morphological races of the anthropologists were interference of genetic races.

Boyd (1950) defined human race as a population which differs significantly from other human populations with regard to the frequency of one or more genes it possesses. According to Garn (1960) "Race is a breeding population, partially isolated reproductively from other breeding populations, arising commonly but not exclusively from geographic isolation." Hulse (1963) stated "Races are populations which can be readily distinguished from one another on genetic grounds alone".

In his famous book *Origins of Man,* Buettner-Janusch (1969) defined race as "Mendelian population separated from another by major geographical barriers; breeding isolate; a population distinguished from another by demonstration of differences in allele frequencies." According to Mayr (1969) race is "An aggregate of phenotypically similar populations of a species, inhabiting a geographic subdivision and differing taxonomically from other populations." Templeton (1998) stated "A subspecies (race) is a distinct evolutionary lineage within a species that genetically differentiated due to barriers from genetic exchange that have persisted for long periods i.e. the subspecies must have historical continuity in addition to current genetic differentiation."

> Diverse as they are, these definitions emphasise, first, an assumption of the role of geographic isolation in race formation. Second, most agree on the importance of breeding population in forming a collection of genes that sets a race apart.

1.3 EARLY RACIAL CLASSIFICATIONS

Initially the scientists were primarily concerned with ordering, naming, and classifying the diversity of life found on the earth. Classifications simplify and bring order to the complexity in the natural world, making it easier to understand and study variation. As the Europeans began exploring the world, naturalists and other writers published descriptions of the people, who looked and acted differently. The first published classification of humans into distinct races seems

to be by François Bernier's (1684), who divided people into various types, namely, the Europeans, Africans (Negroes or blacks), Asians (Far Easterners) and Lapps.

Western Scholars viewed humans as "natural beings." Carl Linnaeus, the great classifier, placed human beings at the top of the chain of nature in a classification along with the primates. He not only classified all living things but also attempted to classify the varieties or subspecies of humans. Linnaeus (1735) separated humans into four basic "varieties" on the basis of geography, colour, humour, posture, and customs. These were termed as the American, European, Asian and African (Table 1.1).

Measuring of skulls and the racial classifications

Blumenbach, the father of physical anthropology and the founder of racial classifications, had an extensive collection of human skulls. This enabled him to empirically investigate differences rather than merely speculate about varieties based on the second-hand observations and European traveller's accounts. He assumed that *Homo sapiens* had been created in one place and then spread across the world, and climate, environment, different modes of life, and the transmission of acquired characteristics shaped these peoples into different races. He divided humans into five varieties based on skull shape, preferably as seen from above, namely the Caucasian, Mongolian, Ethiopian, American and Malay (Polynesian, Melanesian, and aborigines of Australia). Blumenbach coined the term "Caucasian", derived from the mountain range between Russia and Georgia and for him the ideal skull type was the Caucasian, with degeneration in other skull types. His 1795 classification was similar to that of his teacher Linnaeus (Table 1.1).

Table 1.1: Comparison of early classifications of man

Linnaeus (1735)	Blumenbach (1795)
American	Caucasian
European	Mongolian
Asian	Ethiopian
African	American
	Malay (Polynesian, Melanesian, and aborigines of Australia)

During the 19th century, the scientists were measuring human bodies and focusing on cranial morphology. Retzius (1842) popularized a measurement called the cranial index (C.I.) defined as the maximum breadth of the skull (B) divided by the maximum length of the skull (L) multiplied by 100 (C.I. = B/L multiplied by 100). The values obtained were grouped under following categories.

a) Dolichocephalic (Long and narrow heads) – C.I. 74.9 or less

b) Mesocephalic (Medium heads) – C.I. 75-79.9

c) Brachycephalic (Short, broad, or round heads) – C.I. 80 or more

So, by comparing cranial index, the anthropologists could objectively study human variation and delineate different groups. Face angle also became an important measurement, with prognathic (jutting out) face being much worse and primitive than orthognathic (less jutting forward or straight) face.

1.4 TYPOLOGICAL APPROACH

The emphasis on cranial morphology, anthropometrics and anatomy during the late 19th century encouraged the continued use of the typological approach in anthropology during the 20thcentury. New methods of quantitative analysis were developed, but the typological paradigm continued, changing little in the way the anthropologists studied human variation and classified races. The metrical and morphological traits used in the analyses and classifications were thought to be stable and environmentally non-adaptive. The traits and classifications were also indistinguishable in many aspects from popular racial stereotypes. Using morphological data, Coon et al. (1950) distinguished six groups of mankind namely the Negroid, Mongoloid, White, Australoid, American Indian and Polynesian which were further grouped into thirty races (Table 1.2).

Table 1.2: Racial classification of Coon et al. (1950)

Murraylan	Hindu
Ainu	Mediterranean
Alpine	Nordic
Northwest European	North American Coloured
Northeast European	South African Coloured
Lapp	Classic Mongoloid
Forest Negro	North Chinese
Melanesian	Southeast Asiatic
Negrito	Tibeto-Indonesian Mongoloid
Bushman	Turkic
Bantu	American Indian Marginal
Sudanese	American Indian Central
Carpentarian	Ladino
Dravidian	Polynesian
Hamite	Neo-Hawaiian

In his magnum opus *The Origin of Races* published in 1962, Coon's main hypothesis was that modern humans (*Homo sapiens*) arose through five separate lines from *Homo erectus*, into the Caucasoid, Mongoloid, Australoid, Congoid and Capoid. He attempted to use Darwin's theory of natural selection to explain the differing physical characteristics of various racial groups. Coon argued that, in their evolutionary development, different races reached the stage of *Homo sapiens* at different times, which explains why races achieved different levels of civilization. Coon's work was extremely controversial; his explanation of multilinear racial development and his emphasis on the white race led many commentators to criticize him for "scientific racism" common to the early 20th century anthropologists. Contemporary researchers such as Sherwood Washburn and Ashley Montagu were influenced by the modern synthesis in biology and population genetics and for them the human species was a continuous "serial" progression of populations, rather than the five "parallel" genetically distinct races in Coon's account.

Garn (1961) proposed that there were three levels of racial groups – geographical races, local races and micro races. Former are major continental units and island chains such as Amerindian, Polynesian, Micronesian, Malenesian-Papuan, Australian, Asiatic, Indian, European and African. Local races were subdivisions within continents e.g., North-Western European, Bantu, and Iranian etc., while micro races could be equated with breeding units. He suggested that "if the local race is equated with the Mendelian population, then the number of local and micro-geographical races is upwards of thirty" (Table 1.3). This type of classification system used the older typological system based on geography and morphology combined with the concept of breeding populations. In a sense, Garn attempted to add a dynamic, evolutionary dimension to the traditional typological classification systems but, in the end, produced a traditional racial classification.

In the 19th century, a number of natural scientists and anthropologists opined that races are objective, naturally occurring divisions of humanity, with a strong relationship between biological races and human social behaviour and culture. Races were distinguished by skin colour, facial type, cranial profile, stature, and texture and colour of hair that were considered to reflect group differences in moral character and intelligence. Their understanding of race was both essentialist and taxonomic. Advent of the Darwinian model of evolution and Mendelian genetics in the beginning of the 20th century, questioned the scientific validity of characteristics used as racial criteria and necessitated a radical reconsideration of the concept of race.

Table 1.3: Racial classification by Garn (1961)

Geographical races	Local races	
Amerindian	Northwest European	North American
Polynesian	Northeast European	Central American
Micronesian	Alpine	South American
Melanesian-Papuan	Mediterranean	Fuegian
Australian	Iranian	Lapp
Asiatic	East African	Pacific Negrito
Indian	Sudanese	African Pygmy
European	Forest Negro	Eskimo
African	Bantu	Ainu
	Turkic	Murrayian Australian
	Tibetan	Carpenterian Australian
	North Chinese	Bushman and Hottentot
	Extreme Mongoloid	North American Coloured
	Southeast Asiatic	South African Coloured
	Hindu	Ladino
	Dravidian	Neo-Hawaiian

1.5 GENETIC CLASSIFICATION OF RACES

There was little recognition of 'Mendelian genetics' and 'Landsteiner's ABO blood groups' until Hirschfeld and Hirschfeld (1919) at the end of the First World War carried out serological tests on large number of soldiers of different nationalities. They suggested that blood groups could be used to delineate biochemical races and identified three major racial types – the European, Intermediate and Asio-African. The article then attempted to trace the origin of the *A* and *B* alleles in all races based on two different hypotheses – first, that *A* and *B* were in the same proportion in all races when humans appeared on the earth, and second that these alleles had different origins in different races. They opined that the latter hypothesis was correct and that India was the cradle for B blood group. The origin of A could not be located, but they assumed that it arose in North or Central Europe and then spread out from there to the rest of the world.

Using ABO blood group data and the racial index of Hirschfeld and Hirschfeld (1919), Ottenberg (1925) suggested that there were six main types (races) of humans (Table 1.4). These types only partially corresponded to the racial groupings based on other characteristics. Snyder (1926), using similarity in the frequencies of the ABO blood groups, came up with the seven-fold racial classification that was very similar to that of Ottenberg (Table 1.4). He advocated the use of blood group data as additional criteria for racial classifications, citing advantages such as their stability under varying environments and simple inheritance.

Table 1.4: Racial classifications based on early genetic data

Ottenberg (1925)	**Snyder (1926)**
European	European
Intermediate	Intermediate
Hunan	Hunan
Indomanchurian	Indomanchurian
African-South Asiatic	Africo-Malaysian
Pacific American	Pacific-American
	Australian

Boyd (1950) argued unacceptability of skeletal analysis in racial classifications as skeletal morphology is difficult to determine in the living people. The skeleton adapts quickly to environmental conditions, skeletal characteristics are controlled by the action of many genes. According to him, the genetic classification of races is scientifically accurate than older classifications; the differences we find between races are inherited in a known manner, not influenced by environment and there is no discrimination against any subject. Boyd used "non-adaptive" traits in the blood such as ABO, Rh and MN blood groups, PTC tasting ability, ABH secretor system and other "non-adaptive" morphological traits to "tentatively" classify humans into six races (Table 1.5). Although Boyd's analysis initiated a change in many of the methods of racial analysis, the major issue remained virtually unchanged and the analyses remained typologically oriented by expanding and updating his classification to thirteen races later (Boyd, 1958) (Table 1.5).

Stewart (1951a, b) noted that the classifications of serologists were not surprisingly different from those of anthropologists using traditional methods. He suggested that the serologists used existing morphological classifications to draw their subjects. Hence, they chose individuals who were phenotypically Asiatic, Indian, White or African etc. Later they analysed the data within this framework by manipulating the gene (allele) frequencies and obtaining a classification similar to the morphological one. Strandskov and Washburn (1951) advocated that genetics and anatomy should be used together in racial classifications.

Table 1.5: Boyd's classifications of races

Boyd (1950)	Boyd (1958)
Early European (hypothetical)	Early European
European (Caucasoid)	Lapp
African (Negroid)	North West European
Asiatic (Mongoloid)	Eastern Central European
American Indian	Mediterranean
Australoid	African
	Asian
	Indo-Dravidian
	American Indian
	Indonesian
	Melanesian
	Polynesian
	Australian (aboriginal)

1.6 MODERN THOUGHT ON RACES – THE ETHNIC GROUPS

In the first half of the 20th century while racial classifications continued to be generated, a few anthropologists such as Ashley Montagu and biologists such as Julian Huxley opined that it was difficult to use zoological nomenclature for classifying humans into groups. They argued that the classification of humans into races was simply not a productive endeavour to examine human variation. Montagu (1942 a, b) was probably the most vocal opponent of the use of the term race to classify humans. Following Huxley (1865), Deniker (1900), and Huxley and Huddon (1936), Montagu (1942a) adopted the term "ethnic group" as a replacement for "race", maintaining that the latter term had lost its usefulness for describing human variability. Subsequently, on July 18, 1950, following World War II, UNESCO issued a statement which included both a scientific opposition to race theories and a moral condemnation of racism and thus suggested to replace the term 'race' as 'ethnic group'.

Montagu (1942a) noted that there were no clear boundaries in the continuous stream of human variation and argued that anthropologists should consider Darwinian natural selection to understand the relationships among human groups

and develop a dynamic "genetical theory of race" using concepts such as exogamy, endogamy, hybridization, mutation, selection, isolation and random genetic drift. He stated that race is merely an expression of the process of genetic change within a definite ecologic area with the goal to discover what factors produce the variation and change gene frequencies.

Washburn (1951) suggested that the physical anthropologists should change their perspective, goals and approaches. The anthropology of the past was one of the techniques of taking careful measurements, computing indices and defining type specimens for static classifications. The new physical anthropology focuses on the mechanisms of evolutionary change and adopts a dynamic perspective. Earlier ways of description and speculative methods were replaced with an emphasis on problems and tests. Washburn's concept of a "new physical anthropology" was controversial but reflected the changing scientific paradigm in anthropology i.e. the shift that was occurring in racial studies and the study of human variation.

At the same time, some anthropologists were proposing that the population (breeding unit) should be the basic unit of study of human diversity and adaptation subjected to specific environmental constraints and responded through the evolutionary mechanisms of mutation, gene flow, genetic drift and natural selection. As these populations adapted to these particular environments, they came to manifest traits (measured by allele frequency differences) that were unique. Thus, races could be viewed as episodes in the evolutionary process (Hulse, 1962) and were not static, fixed entities but dynamic units that constantly changed. One could also study the relationship between cultural and biological diversity and this, as Thieme (1952) states, is the anthropological perspective of combining cultural and physical anthropology.

1.7 THE NON-EXISTENCE OF THE RACES – THE CLINES

Livingstone (1962) in his article "On the non-existence of human races" pointed out that the static typological notion of races was simply not compatible with the dynamic concept of natural selection. He did not deny the differences among populations but argued that these differences did not match races. As an alternative to this static approach, he suggested that research should focus on geographical variation of single traits, or what was called "clinal variation." In other words, "there are no races, there were only clines". If the goal of anthropological research was to explain the genetic variation among populations, then the racial approach was simply not adequate.

Montagu (1962) insisted that race was an ambiguous, overused and very loaded term that should be dropped from the scientific literature since it continued to mix biology, culture, intelligence, personality and nations together. Like Livingstone, Montagu did not deny that there were differences between peoples. However, he argued that one should study a population's diversity, observe variation, and then compare it to other populations. Brace (1964) advocated for the study of individual traits, stating that races, and even populations, were not adequate for study of human diversity. The distribution of individual traits and the selective pressures modifying them should be focused. Thus, clines replaced races as the units of study for many anthropologists during the 1960s and 1970s.

1.8 CAUSES OF BIOLOGICAL DIVERSITY

Race is a biological consequence and as such explains practically nothing. The collective unit of evolution is the population where all the forces of biological diversity such as mutation, natural selection, genetic drift and hybridization operate. The process of evolution may be very slow but to a large extent depends on mutations where new genes are introduced into human populations. The evolutionary forces of mutation and selection go hand-in-hand, and the chances of survival of new mutant gene in the population will depend upon the kind of selective advantage it confers on its fertility rate. In spite of the elimination of a large number of mutant alleles, a considerable number are "selected for" by natural selection and overtime become established in a population with an appreciable frequency (= 1%), leading to the condition of genetic polymorphism.

In addition to mutation and selection, a force that substantially contributes to biological diversity in a population is genetic drift (or simply drift), a statistical process of pure chance devoid of any biological consideration. In a large population, changes in allele frequencies due to drift (sampling error) in gamete transmission are small from one generation to another, but the cumulative effect over many generations may be substantial. In the case of human populations derived from a small number of individuals the drift may be extreme, resulting in the phenomenon known as the "founder effect". Because of sampling errors, the allele frequencies at various loci are likely to differ in the founders from those in the population from which they are derived. Thus, for example, if one of the founders of a new colony happened to carry an allele with very low frequency in the parental population, the subsequent expansion of the colony will result in a disproportionately high frequency for that allele in the new population. Indeed, there are instances in human history where such extreme cases of genetic drift have occurred (Roberts, 1968).

A similar drift phenomenon, but without migration, occurs when a population goes through "bottleneck". Epidemics, wars, natural calamities, and unfavourable climatic, nutritional and morbidity conditions may cause a population to be drastically reduced in number. The survivors reconstitute a new population, but random effects might have considerably altered its allelic frequency during the "bottleneck" and in the successive generations also. The possibility cannot be ruled out as some of the allelic differences seen among the contemporary ethnic groups of human populations are the result of such "founder effects" and "bottlenecks" from time to time.

The present distributions of racial variations in man can be explained through hybridization, a process by which genes from one population may be brought into another population, thereby changing the frequency of alleles in the hybrid population. Hybridization is expressed as an admixture of genes from two parent populations in a descendent hybrid population. Two comparatively recent and most important human examples of hybrid (mixed) populations are the 'mulatto' (a Negro x White cross) mainly in South Africa and North America and 'mestizo' (an American Indian x White cross) mainly in South America.

1.9 SUMMARY

Although it is not easy to divide the world population into clear-cut categories such as races as the dividing lines between them are arbitrary, many anthropologists now consider race to be more a social or mental construct than an objective biological fact. Nonetheless, the European scientists and physical anthropologists of the 17th and 18th centuries proposed various systems of racial classifications based on observable traits such as skin colour, hair colour/type, body proportions, and skull measurements, essentially codifying the perceived differences among broad geographic populations of humans. The traditional terms for these populations – the Caucasoid, Mongoloid and Negroid - are now controversial in both technical and non-technical usage. Presently, the biological aspect of race is described not by observing physical features but rather from characteristics such as blood groups and other genetic polymorphisms.

Because of the nature of geographical variation in man it has been stated that there are no races but only clines. However, a well regarded definition of race is "population differing in gene frequency" and clearly such populations exist. Indeed, on such a definition practically every human breeding population is a race (Harrison et al., 1990). The issue is whether taxonomic grouping within the *Homo sapiens* is meaningful and helpful or whether human groupings of any kind above the breeding population are arbitrary, if not artificial.

At the turn of the 21st century, the scientists at the National Institute of Health, U.S.A. had announced that they had put together a draft of the entire sequence of the human genome, and the researchers had unanimously declared there is only one race - the human race (Angier, 2000). In fact, there is no "human race" - only the "human species" (*Homo sapiens*); all human beings belong to a single species because they can interbreed and produce fertile offspring.

References

Angier, N. 2000. *Do Races Differ? Not Really, DNA Shows.* New York Times, August 22.

Boyd, W. C. 1950. *Genetics and the Races of Man: An Introduction to Modern Physical Anthropology*. Boston: D C Heath and Company.

Boyd, W. C. 1958. *Genetics and the Races of Man*. Boston: Boston University Press.

Brace, C. L. 1964. *On the Race Concept.* Current Anthropology 5: 313-320.

Broberg, G. 1983. *Homo sapiens* - Linnaeus's Classification of Man. In: *Linnaeus: The Man and His Work*, edited by Frängsmyr T. Berkeley: University of California Press. pp. 156-194.

Buettner-Janusch, J. 1969. *Origins of Man*. New Delhi: Wiley Eastern Private Limited.

Coon, C. S. 1962. *The Origin of Races*. New York: Alfred A Knopf.

Coon, C., Garn, S. and Birdsell, J. 1950. *Races: A Study of the Problems of Race Formation in Man*. Springfield: Charles C Thomas.

Deniker, J. 1900. The Races of Man. Reprinted in Count E W (1950) *This Is Race: An Anthology Selected from the International Literature on the Races of Man*. New York: Henry Schuman, pp. 207-221.

Dobzhansky, T. 1944. *On species and Races of Living and Fossil Man.* American Journal of Physical Anthropology n.s. 2: 251-265.

Dobzhansky, T. 1970. *Genetics of the Evolutionary Process*. New York: Columbia University Press.

Garn, S. M. Ed. 1960. *Readings on Race*. Springfield Illinois: Charles C Thomas.

Garn, S. M. 1961. *Human Races*. Springfield Illinois: Charles C Thomas.

Garn, S. M. and Coon, C. S. 1955. *On the Number of Races of Mankind.* American Anthropologist 57: 996-1001.

Harrison, G. A., Tanner, J. M., Pilbeam, D. R. and Baker, P. T. 1990. *Human Biology. An Introduction to Human Evolution, Variation, Growth and Adaptability.* 3rd Edition. Oxford: English Language Book Society/Oxford University Press.

Hirschfeld, L. and Hirschfeld, H. 1919. *Serological Differences Between the Blood of Different Races: The Result of Researches on the Macedonian front.* Lancet 197: 675-679.

Hooton, E. A. 1926. *Methods of Racial Analysis.* Science 63: 75-81.

Hulse, F.S. 1962. *Race As An Evolutionary Episode.* American Anthropologist 64: 929-945.

Hulse, F. S. 1963. *The Human Species*. New York, Random House.

Huxley, T. H. 1865. On the methods and results of ethnology. In: *Man's Place in Nature and Other Anthropological Essays.* London: Macmillan.

Huxley, J. S. and Haddon, A. C. 1936. *We Europeans*. New York: Harper.

Livingstone, F. B. 1962. *On the non-Existence of Human Race*. Current Anthropology 3: 279-281.

Mayr, E. 1969. The Biological Meaning of Species. *Biological Journal of the Linnaean Society* 1(3): 311-320.

Montagu, A. 1942a. *The Genetical Theory of Race, and Anthropological Method.* American Anthropologist 44: 369-375.

Montagu, A. 1942b. *Man's Most Dangerous Myth: The Fallacy of Race*. New York: Columbia University Press.

Montagu, A. 1945. *On the Phrase "Ethnic Group" in Anthropology.* Psychiatry 8: 27-33.

Montagu, A. 1950. *On Being Human*. New York: Henry Schuman.

Montagu, A. 1962. *The Concept of Race*. American Anthropologist 64: 919-928.

Ottenberg, R. 1925. *A Classification of Human Races Based on Geographic Distribution of the Blood Groups.* Journal of the American Medical Association 84: 1393-95.

Retzius, A. 1842. *Om Formen of Nordboarnes Cranier*. Stockholm: Fork. Skand. Naturf. tretje, Moll.

Roberts, D. F. 1968. *Genetic Effects of Population Size Reduction.* Nature (London) 220: 1084-1088.

Slotkin, J. S 1965. *Readings in Early Anthropology*. Chicago: Aldine.

Snyder, L. H. 1926. *Human Blood Groups: Their Inheritance and Racial Significance.* American Journal of Physical Anthropology 9: 233-263.

Stewart, T. D. 1951a. *Scientific Responsibility [editorial].* American Journal of Physical Anthropology 9: 1-3.

Stewart,T. D. 1951b. *Objectivity in Race Classifications.* American Journal of Physical Anthropology 9: 470-472.

Strandskov, H. H. and Washburn, S. L. 1951. *Genetics and Physical Anthropology [editorial]*. American Journal of Physical Anthropology 9: 261-263.

Templeton, A. R. 1998. *Human Races: A Genetic and Evolutionary Perspective*. American Anthropologist 100: 632-650.

Thieme, F. P. 1952. The *Population as a Unit of Study.* American Anthropologist 54: 504-509.

UNESCO. 1956. *The Race Question in Modern Science*. New York: UNESCO.

Washburn, S. 1951. *The New Physical Anthropology.* Transactions New York Academy of Sciences, series 2, 13: 298-304.

www.newworldencyclopedia.org

Suggested Reading

Boyd, W. C. 1958. *Genetics and the Races of Man*. Boston;Boston University Press.

Buettner-Janusch, J. 1969. *Origins of Man*. New Delhi; Wiley Eastern Private Limited.

Coon, C. S. 1962. *The Origin of Races*. New York; Alfred A Knopf.

Garn, S. M. 1961. *Human Races*. Springfield Illinois; Charles C Thomas.

Montagu, A. 1942. *Man's Most Dangerous Myth: The Fallacy of Race*. New York;Columbia University Press.

Sample Questions

1) Discuss early attempts to classify humans into races.
2) Describe genetic classifications of human races.
3) Give an account of various causes of biological diversity in man.
4) Write an essay on non-existence of the human races.
5) Write short notes on the following.
    a) Ethnic groups
    b) Clines
    c) Modern thought on race

UNIT 2 DISTRIBUTION AND CHARACTERISTICS

Contents

Learning Objectives

Once you have read this unit, you will be able to appreciate the

- distribution and characteristics of Caucasoid;
- distribution and characteristics of Mongoloid;
- distribution and characteristics of Negroid;
- distribution and characteristics of Australoid or Archaic Caucasoid; and
- and also distribution and characteristics of sub-groups of these major races.

2.1 INTRODUCTION

Ancient literature provided us with some descriptions of physical features of human groups. Definite methods were devised for classification of the races and sub groups in recent times.

2.2 DISTRIBUTION AND CHARACTERISTICS

Race, a distinctive combination of physical traits is due to inheritance. E.A.Hooton, an American anthropologist (1931) recognised three primary races-Caucasoid, Negroid and Mongoloid along with several sub races which he further modified in 1947, based on the relative commonness of physical characteristics. Caucasoid features are chiefly found among the Europeans and their descendants whereas Mongoloid features are found in the people of Asia, Indonesia, Indians of North and South American. Negroid features are restricted among the populations of Melanesia and African descendant Americans. However, Australoid a fourth major racial group is found by anthropologists based on peculiarity in physical characters.

2.3 CAUCASOID

Caucasoid incorporates a number of sub-groups with an array of racial elements and generalised characters among people. Skin colour varies from white to brown and at times dark brown with flat wavy to varied degrees of curliness of hair, lighter but seldom jet black. Hair texture is usually medium to fine while quantity of body and facial hair is generally moderate or abundant. Caucasoids possess dolichocephalic to brachycephalic head, leptorrhine to mesorrhine nose, high nasal bridge, high forehead, thin lips, distinct chin, prominent cheek bones without facial prognathism, lighter shades of eye colour and tall stature. The Caucasoid are further divided into eleven subgroups namely Mediterranean, Indo-Afgan, Nordic, Alpine, East Baltic, Dinaric, Armenoid , Keltic, Lapp, Indo- Dravidian, Polenesian and Ainu.

2.3.1 Mediterranean

Mediterranean, the oldest white sub-race is named after their original home – the Mediterranean shore – that migrated later to all directions. They are present in Portugal, Spain, France, Italy, Greece, Turkey, some parts of North Africa, Arabia, Iran, Afghanistan, Pakistan and India. These people developed Neolithic culture in Europe, North Africa, Near-East, South-East Asia and the region of Upper Nile. They demonstrated domestication of plants and animals, weaving, pottery, erection of monuments, etc., during the Neolithic period. The Mediterranean people exhibit light body build, dark complexion with narrow head form. Further, three distinct sub-types have been distinguished among the Mediterranean sub-group.

a) **Classical Mediterranean (Basic Mediterranean or Ibero-Insular)**

These people inhabit in Mediterranean basin and also in Portugal, Spain, France, Germany, Italy, etc. Similar physical features are also found among the Egyptians of North-Africa, the Berbers of Morocco, Arabia and the Jewish population of Palestine.

The physical features of Classical Mediterranean are: White skin colour, black and curly hair, dolichocephalic to mesocephalic head form with a cephalic index of 73 to 76, straight and medium thick leptorrhine nose with long oval face, pointed chin, flat cheekbones, slightly high fore head, dark eye colour, medium stature with slender and delicate body built.

b) **Atlanto-Mediterranean (or Littoral)**

Atlanto-Mediterranean people are distributed in North-Africa, Palestine, Iraq with little representation in the British Isles, Spain and Portugal. The physical features are: dark skin and hair colour, wavy to curly hair with dolicocephalic to mesocephalic head form, deep rooted and straight nose with medium breadth and height, long face with deep jaws, prominent cheek bones, receding forehead with well developed eye-brow ridges, medium brown to dark brown eye colour with tall stature and more robust than the Classic Mediterraneans.

c) **Indo-Afghan (or Irano-Afghan)**

These are mostly found in Iraq, Iran, Afghanistan, Baluchistan, North- West India and Pakistan. The Physical features are: Light brown skin colour, wavy and black hair with abundant hair on body and face showing dolichocephalic to mesocephalic head with a cephalic index of 71 to 77, leptorrhine nose having straight or convex nasal bridge with pointed tip, long and narrow face with dark eyes, medium to tall stature with an average height of 167 cm.

2.3.2 Nordic

Nordic are said to be originally Aryans, the people of Scandinavia who represent Nordic racial type distributed in Scandinavia, Baltic region, Northern Germany, Northern France, parts of Netherlands, Belgium, British Isles, United States and some of the British colonies and sporadically in parts of Europe.

The main physical features are: Pinkish or reddish white skin colour possessing slightly wavy with varying shades of head hair either fine or medium and hair on body and face are neither sparse nor medium. They possess mesocephalic head with a cephalic index of 76 to 79 consisting of straight, prominent and leptorrhine nose with high nasal root and bridge, long and narrow face with strong facial bones and flat cheek bones. Their forehead is vertical with moderately developed eye-brow ridges showing prominent chin, blue or grey eye colour with very thin lips and tall stature with 172 cm of average height.

2.3.3 Alpine

The origin of Alpines traces to Central Asia. Anthropologists tried to correlate this sub-group with Asiatic Mongoloid race. The admixture of Alpines with other racial types Nordic, Mediterranean, etc. is also evidenced. The Alpine population is found mainly in Central and Eastern Europe especially from France to the Urals. They are also found in the Denmark, Balkan, Norway, Northern Italy, and in the mountains of Asia Minor with sporadic distribution in whole of Europe.

The main physical features are: Olive or brunette white or bronze skin colour, slightly wavy, medium brown to dark brown hair with medium to fine texture

and abundant hair on body and face, brachycephalic head with a cephalic index of 85, straight or slightly curved leptorrhine or mesorrhine nose, with short, thick and fleshy tip and moderately developed high nasal root. They are differentiated with round, broad and short face with high forehead and prominent chin. Their eyebrow ridges are either moderately or strongly developed with straight, dark to medium brown eyes and blue occasionally, moderately thick lips, medium to short stature with 165 cm of average height and strong body built.

2.3.4 East Baltic

The East Baltic group exhibits an admixture of Nordic and the Alpine traits. Certain features suggest an Asiatic Mongoloid influence. They are concentrated in North-Eastern Germany, Baltic States, Poland, Russia, Finland, etc.

The main physical characters are: Tawny or creamy white skin colour, straight or wavy hair with medium to coarse texture exhibiting ash-brown, rarely reddish colour. The facial hair is moderate and body hair is scanty. Head form is brachycephalic with a flat occiput, convex mesorrhine nose with broad nasal wings and snubbed tip, medium nasal root with moderately high and broad nasal bridge. Face is square with prominent cheeks and high forehead resulting in squared lower jaws and developed chin. Their eye-brow ridges are moderate having medium lips, light-blue or grey eye colour and medium stature.

2.3.5 Dinaric (Adriatic or Illyrian)

This race exhibits both the Nordic, Armenoid Alpine and Atlanto-Mediterranean in Dinaric Alps region, especially the Yugoslavia, Albania, Austrian Tyrol and also in Central Europe.

The main physical features are: Light burnet to olive shade skin colour, straight or wavy or curly hair with medium texture and dark brown colour, abundant body and facial hair with flat occiput, brachycephalic head, leptorrhine nose with narrow and fleshy tip, high nasal root and bridge, long and narrow face with deeper, heavier and more projecting chin, straight and slopy forehead with brown eyes, thick lips and tall stature with an average of 172 cm.

2.3.6 Armenoid

They are admixture of classical Mediterranean, Alpine, Nordic and Indo-Afghan racial elements. But recent studies reveal that Armenoid is an admixture between the Mediterranean and the Alpine. Asia Minor is the earliest known area from which the Armenoid race might have been spread southward to Arabia and India.

The sculptor of a man discovered from the ruins of Mohenjo-daro shows Armenoid physical features concentrated in Turkey, Syria and Palestine and also amongst people of Iraq, Iran and Balkan Countries. Typical Armenoid representatives are the ancient Hittites. Similar racial elements have also been projected among the Babylonians, Assyrians and Hittites.

The physical features are: Tawny white or olive skin colour, wavy or curly hair with coarse to medium texture and colour varies from dark brown to black, abundant body and facial hair with brachycephalic head and vertical occiput, very prominent leptorrhine nose with convex profile, depressed and fleshy nasal

tip and high nasal root. Armenoid possess narrow and elongated face with well developed cheek bones, sloppy forehead, thick eye-brow ridges especially in males. The chin confirms medium prominence that have medium-brown to dark brown eyes, thick and medium lips, tall stature with an average height of I67 cm. The body is well built with a predisposition towards obesity.

2.3.7 Keltic

Keltics are found in Ireland, Scotland, Wales and also sporadically distributed in England and in parts of Western Europe.

The physical features are: Pale white skin colour with wavy or curly rarely straight hair usually medium brown to dark brown and rarely black colour, mesocephalic head and leptorrhine nose with straight or convex profile having long nose with narrow and high nasal bridge, long and narrow face with compressed cheek bones and deep chin, blue or grey eyes and tall stature with 172 cm of average height.

2.3.8 Lapp

Lapps are found in Northern Scandinavia, Northern Finland, Sweden, Norway and North Western region of Russia formed with an admixture of Russians, Fins, Swedes, Norwegians, etc. The distinct features identified them as a separate ethnic group. Infact some of the Lapps are found to be classified with the Mongoloids as they bear more similarity with the Caucasoids than the Mongoloids.

The physical features are: Greyish yellow tinge skin colour with straight or slightly wavy and dark brown or black hair, sparse hairs spread on body and face, brachycephalic head, mesorrhine nose, concave nasal profile with snubbed nasal tip, broad and short face with forward projection and prominent cheekbones showing little or no prognathism and well developed eyebrow ridges on the narrow forehead. Eye colour is highly variable with occasional epicanthic fold and thick lips among Lapp who exhibit medium stature (159 cm).

2.3.9 Indo-Dravidian (Dravidian)

Indo-Dravidian people are distributed in South and Central India and mostly Caucasoid. An admixture of Classical Mediterranean and Australoid (Veddid) is found among these people.

The physical features are: Light to dark brown skin colour and wavy or curly, black hair colour with sparse to medium bodily hair, dolichocephalic head, mesorrhine nose depicting depressed nasal root with high nasal bridge and thick tip, narrow and medium face with little prognathism at times with thick lips, round forehead, moderately developed eyebrow ridges, medium to dark brown eyes and medium stature with an average height of 164 cm.

2.3.10 Polynesian

The Polynesians, a composite race originated as white people but got mixed with the peoples of early Mediterranean, Asiatic Mongoloid and Oceanic Negro and thus concentrated in Polynesian Islands of the Pacific Ocean namely New Zealand, Friendly Islands Samoa, Marquesas and Hawaii.

Their physical characteristics are: Light to yellow brown skin colour with wavy sometimes straight or curly hair depicting dark brown to black colour, sparse body and facial hair, predominantly brachycephalic though dolichocephalic and mesocephalic forms of head with flat occiput, prominent and mesorrhine nose with straight or convex profile resulting in depressed or high nasal root and bridge, thick tip and broad nasal wings. Face is long and broad with prominent cheek bones, high and narrow forehead with slight slope, less developed eye-brow ridges and well developed chin. Eye colour is medium to dark brown with a rare epicanthic fold. Lips are moderately thick exhibiting tall stature with muscular and well built body.

2.3.11 Ainu

Ainus are basically Caucasoid but Mongoloid features are also found and exhibit close resemblance with the Australian aborigines in physical features. They are found in Northern Japan, South Sakhalin and Yezo.

The physical features are: Light brown to brownish white skin colour, wavy hair with dark brown to black colour and spread abundantly on body and face referred as the "Hairy Ainu". Head form is usually mesocephalic and sometimes dolichocephalic, short nose with mesorrhine to platyrrhine form having straight to convex profile, slightly depressed nasal root, moderately high nasal bridge, short and medium face with mesoprosopic and orthognathic form and well developed chin, medium to dark brown horizontal eyes and thin lips having medium to short stature with thick body.

2.4 MONGOLOID

Mongoloids have probably originated in Central Asia and moved to different directions .The Mongoloids are divided into four main subdivisions on the basis of their geographical distribution. These are (1) The Classical or Central Mongoloid, (2) The Arctic or Northern Mongoloid or Eskimoids, (3) The Southern or Indo-Malayan Mongoloids and (4) The American Indians.

The Mongoloid physical features are: Yellowish brown tinge skin colour consisting of straight and black hair, scanty body and facial hair, brachycephalic head with concave or straight nose having low nasal root and bridge, broad and flat face with prominent cheek bones, narrow slit-like opening of eyes with epicanthic fold and variable stature.

2.4.1 Classical Mongoloid or Central Mongoloid

These are distributed mainly in Siberia and Amur River district and sporadically in Northern China, Mongolia and Tibet. The representative groups are Buriat, Koryak, Goldi, Gilyak, etc.; this racial element is present in Tibetans and some other Northern Chinese.

The physical features are: Yellow or yellowish brown skin colour, straight, coarse and black hair spreading sparsely on body and face, usually brachycephalic head but mesocephalic and dolichocephalic are also found with a projected occiput region, straight or concave nasal profile consisting of low nasal root without any depression, low nasal bridge with medium breadth and moderately spread nasal wings. The sketch of the face is very broad with square jaws and round forehead

of medium height. The cheekbones are strongly developed and projected laterally as well as forwardly. Eyes are medium dark brown, obliquely set with slit-like opening with typical epicanthic fold. Stature is variable and well built body.

2.4.2 The Arctic or Eskimoid

These are found in Northern Asia, the Arctic coast of North America, Greenland, Labra and Western Alaska, the representative populations are the Eskimos, Chukchis, Kamtchadales, Yakuts, Samoyedes, etc.

The physical features are: Yellow to brownish skin colour, hair is straight, coarse and black colour on head with scanty hair on face and body. Head varies from brachycephalic to mesocephalic as observed from Eastern Aleuti Eskimo. Kuskokwin Eskimo are brachycephalic; Greenland Eskimo and Arctic Eskimo are mesocephalic. Their nose is narrow but prominent consisting of large and broad face with flat prominent cheek bones, black and straight eyes, sometimes epicanthic fold is present. Stature is mostly short. Western Eskimos are taller than Alaskan Eskimos. The body proportion is peculiar with small hands and feet, large trunks and relatively short legs.

2.4.3 Indonesian-Malay Mongoloid

Indonesian-Malay Mongoloid reflects admixture of Caucasoid and Negroid elements. They are distributed throughout the South Asia and are referred Indonesian-Malay Mongoloid racial type further divided into two groups-Malay type and Indonesian type.

a) **Malay type**

Malays are distributed in Southern China, Indo-China, Burma, Thailand, Dutch East Indies, the Philippines, Japan, etc. The Japanese mostly belong to this Malayan type of racial sub-group.

The physical features are: Light to dark yellow brown skin colour purport to be straight and black hair with occasional reddish tinge, brachycephalic head, mesorrhine or platyrrhine nose with slightly depressed nasal root and low nasal bridge, short and broad face with prominent cheek bones, medium to dark brown eyes, sometimes black, internal epicanthic fold present and short stature with average of 158 cm.

b) **Indonesian type or Nesiot**

These are found in Southern China, Indo-China, Burma, Thailand, etc.

The physical features are: Light red to medium brown skin colour, straight or wavy black hair, sometimes with a reddish tinge, mesocephalic head form with mesorrhine narrow, high and long nose. Face renders narrower, longer and more oval than the Malay type. Eye colour is black with occasional reddish tint with a less frequent internal epicanthic fold. Lips profess to be thick with stature slightly shorter than the Malay type averaging 155 cm. The body is slender in form.

2.4.4 The American Indian or Amerindian

They are Mongoloids, despite the presence of racial elements from Caucasoid, Australoid and Negroid people. The American Indians are distributed in different areas of North, Middle and South America.

The characteristic features are: yellow to red brown skin colour that present straight or slightly wavy, coarse and black hair, sparse distribution of hair on body and face, dolicho-mesocephalic or brachycephalic head, predominantly mesorrhine long nose and high nasal bridge with convex profile and medium thick lips. Broad face is embodied with typical Mongoloid cheek bones, sloping forehead and prominent chin. Eye-brow ridges and glabella are strongly elevated showing shovel-shaped incisors with medium prognathism. Dark brown to black eye colour with frequent internal epicanthic fold present in women and children whereas external epicanthic fold is a common phenomenon both in males and females. Lips are thin with varied stature.

a) **Palaeo – Amerind**

These have also been designated as Lagoa Santa type of Brazil, Ecuador: Orinaco. Basically it is an archaic South American race. A few of their living representatives are Botocudo, Buru, etc., some are found in the Eastern United States, Canada and America.

The physical features are: Dolichocephalic head with long and narrow face exhibiting more reddish brown than yellowish brown skin colour. Their hair is almost black and wavy.

b) **Northern Amerind**

North American Indians and the people of the Northern and Eastern Woodlands belong to this group.

The physical features are: Yellowish brown skin colour with straight and black hair, dolichocephalic or mesocephalic head with straight or convex profile, mesorrhine nose, oval shaped face with medium to dark brown eyes and an external fold. The stature ranges from 161 to 175 cm.

c) **Neo-Amerind**

These are distributed in South America, Central America and North American plateau.

The physical features are: Yellow-brown skin colour is depicted consisting of straight and black hair. Neo-Amerind symbolizes brachycephalic head having mesorrhine nose with straight or concave profile. They have broad and short face with black eyes and an external fold. Short to tall stature and the height varies from 155 to 178 cm.

d) **Tehucleche**

They live in Patagonia and probably the Onas of Tierra del Fuego constitute a branch of Tehucleche.

The physical characters are: Brownish skin colour, straight and black hair, brachycephalic head, mesorrhine nose with straight profile. They possess square and broad face, black eyes with external fold and have tall stature which varies from 173 to 183 cm.

e) **North-West Coast Amerind**

They live in the West coast of North America. There are two sub-types, Northern type and Southern type: The Northern type is taller. Skin and hair

is lighter in colour than any other Northern Amerinds. Stature is medium with long arms and short body. Northern type has concave or straight nose and a broad face with moderate height. In southern type nose is convex and high face.

2.5 NEGROID

Negroids are mainly divided into two types-African Negro (Ulotrichi Africani designated by Haddon) and Oceanic Negro (Ulotrichi Orientalis designated by Haddon).

The physical characters are: Dark brown to black skin colour with woolly or frizzly and black hair, sparse body hair, dolichocephalic head with protruding occiput region, broad and flat nose, nasal root and bridge usually low and broad, facial prognathism often marked and round forehead with small eye-brow ridges, chin is rounded and receding dark brown to black eyes, short and wide ears with rolled helix, little or no lobe, thick and everted lips and varying stature.

2.5.1 African Negro

African Negro is further classified into five sub-divisions:

- True Negro
- Nilotic Negro or Nilotes
- Bantu-speaking Negroes or 'Bantu',
- Bushman-Hottentot and
- Negrillo.

a) **True Negro**

True Negro is distributed in West Africa and in Guinea coast.

The physical characteristics are: Dark brown or black skin colour with woolly and black hair, dolichocephalic head, platyrrhine nose and prognathous face often with a bulging forehead. Their eyes are dark brown to black with thick everted lips and tall stature with an average height of 173 cm. Their body is well-built with short legs and long-arms.

The typical Forest Negroes show slightly different physical characters from that of True Negroes. Forest Negroes live in a region extending from the Senegal River in the West to Sudan, Uganda and Northern Rhodesia.

Their physical characters are: Dark brown to black skin colour often woolly and black hair and dolichocephalic head, broad platyrrhine nose with low nasal root and flat nasal bridge retreating forehead, marked facial prognathism, prominent chin and cheek bones, dark brown to black eyes with everted lips. Their stature is shorter than True Negroes and average height is about 165 cm. The face and body are very rough.

b) **Nilotic Negro or Nilotes**

Nilotic Negroes have different features from the True Negroes due to admixture of Mediterranean element since some prehistoric Mediterranean people moved into Nilotic regions resulting in Nilotic Negroes of North-

Eastern Africa. Besides, Nilotes as the Shilluk, the Dinka, the Kavirondo and others show certain Hamitic or Ethiopian elements. They are concentrated in the regions of Upper Nile Valley and Eastern Sudan.

Their physical characters are :Very dark to bluish black skin colour, woolly and black hair, dolichocephalic head and cephalic index is 71-74. They have platyrrhine nose form with low nasal bridge and nasal root, broad and short face with less facial prognathism. Their forehead is retreating and chin better developed than Forest Negroes. They have dark brown eyes with lips thick and everted but little lesser than in those of True Negroes. Stature is very tall with an average height of 178 cm that pose to having long and slim figure.

c) **Banta-Speaking Negroid or 'Bantu'**

Bantus are essentially Negroes among whom an infiltration of Hamitic, Negrito and Bushman-Hottentot elements is reflected. Large number of Bantu-speaking peoples of Central and Southern Africa has been included in this group; wide ranges of variation in physical characters have been noticed within the group.

The physical characters are: Dark chocolate varying from yellowish-brown to black skin colour, woolly or frizzly and black hair, dolichocephalic head, but mesocephalic is not unusual. Nose is narrow and more prominent than in the true Negroes. Facial prognathism is marked. Mesocephalic group possesses less marked prognathism with more flat forehead. Eye colour is dark brown. Stature is medium or above average while the mesocephalic group is shorter.

d) **Bushman-Hottentot**

The Bushman and the Hottentot are more or less same people in terms of physical characters. But, culturally they are different from each other. Hottentots are known as the Khoi Khoi and the Bushmen, the Khuai or San. The Bushmen mainly confined to the Kalahari Desert, though previously they occupied a greater part of Africa. The Hottentots are distributed in South-West Africa.

The physical features are: Light to brownish yellow skin colour in Bushmen and light reddish-yellow in Hottentot. Hair is pepper-corn, i.e., short and shows a tendency towards coil, simple coils to spiral knots are found on head: bare spaces are present between them, hair is black in colour. The hair on body and face is sparse or absent. Head is dolichocephalic and high in the Bushmen whereas it is mesocephalic and low in the Hottentots. Parietal bosses are more marked and occiput is less protruding in the Bushmen than in the Hottentots. Nose is platyrrhine with very broad and flat nasal root, low and broad nasal bridge and concave nasal profile. Lips are thick, short, square and orthogonathous in the Bushmen. It is more elongated, triangular and somewhat prognathous in the Hottentots. The chin is small and the cheek bone is very prominent. Bulbous forehead shows little developed eye-brow ridges. Eye is narrow and slant and colour is dark brown to black. Ears are frequently lobeless. Hottentots are taller than the Bushmen. Average height of Bushmen and Hottentots are 145 cm and 160 cm respectively. Their hands and feet are small. Steatopygia (immense deposit of fat in the buttock) is more pronounced in the Hottentot women than in the Bush

women.

e) **Negrillo (African pygmy)**

The Negrillo type has been represented by the groups like Akka, Batwa, BamBute, etc., who live in Equatorial forests of Congo region.

Their physical characters are: Yellowish light brown to reddish brown, rarely very dark skin colour, short, woolly or pepper corn and dark rusty brown head hair, yellowish body hair, hair under armpits is brown and black on pubis. Head is mesocephalic, nose is very broad and flat. The nasal wings are very broad and high. Face is prognathic with weak and narrow chin outlined with dark brown eyes. Lips are full but not everted. Very short stature; average height is 136 cm. Their arms are long and the legs are short with short trunk. Steatopygia is rarely present in women.

These pygmies are distributed in the Congo region of Equatorial Africa, Malay Peninsula, Sumatra, Andaman Islands, Philippines, New Guinea, etc. In reference to the geographical position, there are three sub-sections: African pygmy or Negrillo, Oceanic pygmy and Asiatic pygmy. Oceanic pygmy and Asiatic pygmy are generally grouped as Negrito.

2.5.2 Oceanic Negro

These types of people are mainly concentrated in New Guinea and neighbouring Islands.

Their physical characters are: Medium to dark brown skin colour with frizzly hair, rarely curly, dark brown to black in colour. The hair on body and face is scanty. Head is usually dolichocephalic, but sometimes it is brachycephalic. Nose is platyrrhine make out to be high and broad nasal bridge with depressed nasal root. Face is less prognathous with small prominent eye-brow ridges. Eye colour is dark brown or black outlined by medium thick lips. Stature is usually short, averaging less than 165 cm.

These divisions of Negroids are further divided into two sub-divisions namely the Negritos, both Asiatic and Oceanic, Papuans and Melanesians.

Andamanese, Semang and Aeta have been grouped as the Asiatic pygmy and the Tapiro is considered as the Oceanic pygmy.

Asiatic pygmy: They are mainly Andamanese from Andaman Islands.

Their physical features are: Bronze to sooty black skin colour, woolly and black hair with reddish tinge. The hair on body and face is scanty or absent. Asiatic pygmies are denoted by small head, brachycephalic with a cephalic index of 83. Nose is straight, sunken at the root. Face is broad at the molar region but the jaws are not projecting. Their eye colour is dark brown, lips are full but not everted and short stature (148 cm).

Semang: These people live in Central region of the Malay Peninsuala and in East Sumatra.

Their physical characters are: Dark chocolate brown skin colour, woolly and black hair with reddish tinge. The hair on body and face is scanty. They are

embodied with mesocephalic head and cephalic index of 79. Their nose is short, flattened and very broad. Face is round and the upper jaw is slightly projecting. Eye colour is dark brown or black outlined with thin lips. Stature is short and average height is 152 cm having sturdy body-built.

Aeta: These people live in the Philippine Islands.

The physical characters are: Sooty brown skin colour that possess frizzly, dark brown or black hair. Abundant hair is present on body and face. Head form is brachycephalic with a cephalic index of 82. Their nose is very short, broad and flat with round or oval face. Eye colour is dark brown or black and moderately thick lips. Stature is short with an average height of 146 cm.

Oceanic pygmy: Tapiro: These people are the inhabitants of New Guinea.

Their physical characters are : Yellowish brown skin colour consisting of woolly and black hair on head, abundant hair on body and face. They possess mesocephalic head with a cephalic index of 79.5. Nose is short, straight and medium. Face outlined as average with dark brown eye colour, deep and convex upper lip. They have short stature with muscular body.

E. A. Hooton has distinguished two varieties among the Negrito viz., the Infantile Negro and the Adultiform Negro. Some anthropologists suggest a genetic interrelationship among the pygmies of different areas. But recent studies point out that pygmy is not a race. Several environmental factors are responsible for the formation of this physical type. Therefore, the concept of a particular race or a common stock is invalid with reference to the pygmies.

Papuans: These people are distributed in New Guinea and other Islands of Melanesia.

The physical characters are: Dark chocolate brown or sooty brown skin colour, frizzly hair with dark brown colour. The body hair, especially facial hair is abundant while the colour often ranges from dark brown to reddish brown. Head is typical dolichocephalic with broad nose showing depressed root with convex profile and thick tip. Face is outlined as prognathic and shows a high and narrow retreating forehead. It often possesses heavy and continuous eye-brow ridges. Eye colour is dark brown with thin lips. They have often medium stature with average height of 168 cm.

Melanesians: Melanesians live in the coastal plains of New Guinea and the neighbouring Islands in Fiji, Admiralty Island, New Caledonia, etc.

Their physical characters are: Dark chocolate, sometimes copper-colour or very dark skin colour with black and frizzly hair, but sometimes it is curly or even wavy. The hair on body and face is scanty. Head form is dolichocephalic but mesocephalic and brachycephalic are also found. The cephalic index varies between 67 and 85. They have platyrrhine nose with deeply depressed and straight or concave profile nasal root and nose tip is thick. Face projects to be average and rounded forehead, wider and longer than the Papuan. But the eyebrow ridges are less developed in comparison to Papuans. Eye colour is dark brown or black usually not outlined by thick lips with short or medium stature.

The American Negroes

Slavery was practiced in United States throughout the first half of the 19th century AD resulting in inter breeding of the people with different ethnic groups such as African Negroes, American Indians and the Caucasoid for a long time. This resulted in admixture of two distinct groups-the North American Caucasoid and the American Negroes. . .

The North American Caucasoid group has the traits of European Caucasoid races, while some from the American Indians and the Negroes are also found in them while, the American Negroes are more complex. They include traits of Forest Negro, Caucasoid and American Indian.

The physical features of American Negroes are: Lighter skin colour from olive to dark brown, hair is woolly and colour is usually black or dark brown. Due to admixture of Caucasoid and American Indian elements hair has become longer. Their head is dolichocephalic. In comparison to Forest Negroes, nose is higher and narrower at the root and the bridge. Face is longer than the Forest Negroes with little or no prognathism. Eye colour is light brown or dark brown outlined with medium or thick lips. Stature is variable although taller in comparison to the Negroes of West Africa. Many people consider Australoid as the fourth major race. Let us view its characters and distribution.

2.6 AUSTRALOID OR ARCHAIC CAUCASOID

The Australoids possess some primitive features similar to Caucasoids; so they are included in sub-division of the Caucasoid racial stock. The Australoids have been classified into two main groups: the Australian aborigines and the Pre-Dravidian or Australoid or Veddoid. These two groups have been further sub-divided into seven subtypes:

2.6.1 Australian Aborigines

These people are an admixture of an archaic Caucasoid type with some Negroids with certain amount of Oceanic influence in them. The people are concentrated chiefly in Australia.

The physical features are: Skin colour varies from medium brown to dark chocolate brown. Hair is wavy or curly but rarely straight and colour varies from medium brown to black with abundant hair on body and face. Head is dolichocephalic and narrow with a Cephalic index of 73. Nose is platyrrhine and very broad, nasal root is markedly depressed and nasal bridge is moderately high and broad, with thick tip. Face is outlined with short and shows medium to pronounced prognathism with receding forehead. Eyebrow ridges are extremely large but the chin is usually receding, medium to dark brown eyes with medium stature with an average of 165 cm.

2.6.2 Pre Dravidian (or Australoid or Veddoid)

This population is mainly concentrated in South and Central India. The typical representatives of this type are Kadar, Kurumba, Irula, Bhil, Gond, Khond, Oraon, etc.

The physical characters are: Skin colour ranges from dark brown to nearly black among Pre Dravidian people. Their hair is wavy or curly and black on head and

scanty on body and face. Head is dolichocephalic and the cephalic index is between 73 and 75. Nose is platyrrhine and very broad with depressed nasal root and bridge is moderately high. Their face is short and narrow and moderate prognathism with sloping forehead and prominent eye-brow ridges. The chin is somewhat receding. Eye colour is dark brown with very often thick lips. Stature is short and average height is 157 cm, with delicately body built.

a) Veddas: The Veddas of Ceylon is also a typical member of this group.

   Their physical features are: Dark brown skin colour with wavy or curly and black hair. Head is the smallest of all living human groups. Their head form is dolichocephalic, with a cephalic index of 70. Nose is platyrrhine, depressed nasal root and low and broad nasal bridge. Face is short and broad, sometimes little prognathism is noticeable. Forehead is slightly receding and eye-brow ridges are often pronounced. Chin is receding. Eye colour is dark brown and lips are medium or thick. Stature is short; average height is 152 cm and small body size.

b) Sakai or Sanoi: The Sakai of Southern part of Malay Peninsula is also a member of Australoid group.

   The physical characters are: skin colour varies from yellowish brown to dark brown with wavy, curly and black hair with reddish tinge. Head is mesocephalic, with a cephalic index of 75. Nose is mesorrhine but approaching towards platyrrhine; the nose is flat with medium breadth. Narrow face with little or no prognathism and the chin is weak. They possess dark brown eye colour with medium thick lips having short stature with an average height of 152 cm whose body is slender and small.

2.7 SUMMARY

Anthropologists have proposed different classifications of mankind. There are three major races - Caucasoid, Mongoloid and Negroid. Australoid has also been given status of separate race by some anthropologists. It has been consensus that major races can be divided into groups and subgroups. It is not appropriate to classify human groups on single criterion as races differ on basis of cluster of physical characters or genes.

Suggested Reading

Boyd, W.C. 1950. *Genetics and the Races of Man. An Introduction to Modern Physical Anthropology.* New York; Little Brown and Co.

Brace, C.L. 2005. *Race is a Four-Letter Word : The Genesis of the Concept.* Oxford; Oxford University Press.

Coon, C. S., Garn, S.M. and Birdsell, J.B.1950. Races: *A Study of the Problems of Race Formation in Man,* 1950, Illinois; Thomas Springfield.

Das, B.M. 2004. *Outline of Physical Anthropology.* New Delhi; Kitab Mahal. pp. 291-356.

Ember, R.C. and Ember, M. 1990. *Anthropology.* Delhi; Prentice Hall of India Pvt. Ltd. pp 120-127.

Garn, S. 1962. *Human Races*, 2nd Edn. Illinois; C.C. Thomas, Springfield.

Hooton, E.A. 1947. *Up from the Ape*. New York; Macmillan.

Mohar, S. 1998. *Human Variation: Races, Types and Ethnic Groups*. Upper Saddle River, N.J; Prentice-Hall, Inc.

Montagu, A. (Ed.) 1964. *The Concept of Race.* New York; Free Press.

Montagu, M.F.A. 1960. *An Introduction to Physical Anthropology.* Illinois, Charles C. Thomas Springfield, pp. 317-407.

Shukla, B.R.K. and Rastogi, S. 1999. *Physical Anthropology and Human Genetics: An Introduction.* Delhi, Palaka Prakashan. pp 374-450.

Sample Questions

1) List and discuss the morphological criteria used for classifying Mongoloids.
2) Distinguish the major physical features of the major races of mankind.
3) Discuss the distribution of Negroid elements in the world.
4) What are morphological differences among major races Caucasoid and Australoid?

UNIT 3 CRITERIA OF RACIAL CLASSIFICATION

Contents

Learning Objectives

What comes to your mind when you hear the term race? Do 'race' and 'racism' terms convey same meaning to you? How many human races are you familiar with? What criteria were adopted to classify people into different races? How did different human races exist according to science? Are human populations obsessed about race despite all pretentious explanations and being a much maligned term? Are there some advantages of studying racial differences? These are some of the questions which not only interests experts, but lay men too:

- the main aim was to classify humankind into races according to human groups' similarities so as to understand human variations in accordance with their geographical distributions;
- this was done on the lines of similar studies conducted on animals by biologists and naturalists; and
- many scholars believe that classically defined races do not appear from an unprejudiced description of human variation.

3.1 INTRODUCTION

The study of racial differences is important for a variety of reasons:

- It provides us with many characteristics of human groups indicating ancient and prehistoric relationships among different people.
- Racial differences are examples of precise biological adaptations to the environmental needs that help in the understanding of human evolution, and
- The association of the racial traits with certain diseases represents an important medical problem.

The study of human variation and the concept of race have posed a challenge to anthropologists and scientists in general. In modern times, scientists were aware of the need for objectivity and the importance of physical characteristics and measurements to study and classify animals and humans so as to understand forces and factors underlying biological variations.

Early racial classifications were given by Linnaeus (1735), Bufon (1749), Blumenbach (1781) and Cuvier (1790). Linnaeus dealt with a classification of human diversity by using subspecies which he called human varieties: America, (Reddish), European (White), Asiatic (Yellow), Negro (Black). Blumenbach had a passion for the natural sciences, including anatomy and the variations of the human race. He made a collection of biological and ethnographic objects and articles, incorporating basic differences in skin pigmentation and hair colour depending on facial features, shape of teeth, and skull morphology to identify five human races consisting of Caucasian, Malaysian, Ethiopian, American, and Mongolian. Though this classification was revised by later scientists, it laid strong foundation for undertaking studies of human variations. These early classifications, later called races, were determined by comparisons of skin colour, face form and skull shape.

3.1.1 Humans are a Polytypic Species

Monotypic species is a type of species with its members belonging to a single subspecies displaying at least one of the following properties: 1) All members of the species are similar and cannot be subdivided biologically into distinct subcategories; 2) The individuals may vary considerably but the variation is essentially random and genetically meaningless; 3) The noticeable variations among individuals follow a pattern, with no clear dividing lines among separate groups. On the contrary, a polytypic species has two or more subspecies. These are separate populations that are more genetically different from one another and reproductively isolated; gene flow between these populations is much reduced leading to genetic differentiation. Thus it is assumed that humans are not a monotypic species, because the third clause/property is explainable on the basis of hybridization due to human migrations. Anthropologists have considered humans a polytypic species on the basis of morphology.

3.1.2 Origin of Modern Humans and their Geographical Differentiation

Human evolution tells that modern humans are the resultant of few hundred thousand years of human migration and population bottlenecks. Genetic analysis

tells us that modern humans arose in Africa about 200,000 years ago and migrated northwards out of the continent about 50,000 - 100,000 years. As the early migrants spread out across the earth, communities were isolated and placed, by the environment, under considerable selective pressures. This would have included food supply, disease, temperature, altitude, ultraviolet radiation and so on. In equatorial regions, strong sunlight and high temperatures strongly favour dark skin (to protect against UV-mediated destruction of the essential vitamin folate) and short curly hair (which keeps the head cooler). When they migrated out of Africa to areas where light intensity is lower and the temperature is cooler, there is less risk of UV-induced folate deficiency. At the same time, dark (melanised) skin can impair vitamin D synthesis, which is essential for calcium uptake and hence skeletal development. For this reason those early people who moved further north lost their basal melanisation (i.e. became white), and also had less use for curly hair. Since these people lived in geographically isolated communities these traits concentrated within these populations, leading to the emergence of distinct-looking races. These groups could not evolve into new species as insufficient time has not allowed the genetic divergence that would be required to create novel species. As Biologists we can sort out some likely causes of speciation and race formation are the micro-evolutionary processes like mutation, recombination, natural selection, genetic drift, gene flow and non-random mating (www.thenakedscientists.com).

Mutation: Heritable change in the genetic material.

- Recombination: New recombination of alleles.
- Natural selection: Favourable heritable variations that survive and provide individuals higher reproductive rate than others in the populations in different specific environments. The frequency of these variations increases in the next generation. Natural selection relates to the concept of fitness. Fitness is an individual's lifetime reproductive output.
- Genetic drift: It refers to the statistical drift over time of gene frequencies in a population due to random sampling and other chance events that occur each generation.
- Isolation: Reproductive isolation in which members of a population become separated from another population by geographical or cultural barriers that prevent the interchange of genes between the separated populations.
- Non-random mating: This occurs when mating individuals are genetically related to one another, or phenotypically more (or less) similar to each other than two individuals chosen at random.
- Genetic admixture or gene flow will bring in different genes from other populations. This process however retards speciation and racial differentiation.

3.1.3 Biological Races

The word 'race' has probably been drawn from the Arabic root *ya'ys* (meaning head or beginning) and was first used by the French scholar, F. Bernier (1684). The term, "race" in current biology has several meanings. In the 19th century, and before, the word "race" was often used in biology as a synonym for a division

below the level of species. Today some biologists still use the word race to refer to kinds or strains of animals, and more often, of plants. Historically, there have been biological definitions of races. By the nineteenth century, western biologists separated human beings into various racial classifications under the assumption that there were distinct biological differences between them, similar to the differences between species or subspecies.

As a biological term, race denotes a subspecies consisting of a more or less distinct population with anatomical traits that distinguish it clearly from other races. Sewall Wright (1978) suggested that human populations that have inhabited separate parts of the world should be considered as different subspecies. However, it is customary to use the term race rather than subspecies for the major subdivisions of the human species as well as for minor ones. It has been argued that it does not require a trained anthropologist to classify an array of Europeans, West Africans and Japanese with 100% accuracy by morphological features like skin colour, and type of hair despite much variability within each of these groups that every individual can be distinguished from every other. This typological approach to race was popular in the 19th Century and the first half of the 20th Century. The review of papers published in a renowned physical anthropology journal, reveal that 78 percent of the articles in the 1931 Journal of Physical Anthropology employed bio-racial paradigm, but in later years only 36 percent did so in 1965, and just 28 percent did in 1996. This only shows that emphasis of physical anthropologists changed from typological approach to studies related with the mechanisms and causes that caused human biological diversity. But race remain a valid biological entity.

3.1.4 Definition of Race

According to Hooton (1926) race is "a great division of mankind, characterised as a group by sharing certain combination of features, which have been derived from their common descent, and constitute a vague physical background, usually more or less obscured by individual variations, and realised best in a composite picture." Boyd (1950) defined race as a population which differs from other populations with regard to the frequency of one or more of the genes it possesses. Garn (1960) defines it as a breeding population, partially isolated reproductively from other breeding populations. Mayr (1969) defined race as, "a subspecies is an aggregate of phenotypically similar populations of a species, inhabiting a geographic subdivision and differing taxonomically from other populations of the species." According to Dobzhansky (1970) races are "genetically distinct Mendelian populations. They are neither individuals nor particular genotypes, who differ genetically among themselves." Vogel and Motulsky (1986) define race as a large population of individuals who have a significant fraction of genes in common and can be distinguished from other races by their common gene pool. According to Templeton (1998), a subspecies (race) is a "distinct evolutionary lineage within a species, genetically differentiated due to barriers from genetic exchange that have persisted for long periods of time."

3.2 MORPHOLOGICAL CRITERIA OF RACE

Humans are often defined by easily observable physical traits like skin and hair colour, hair form, characteristic features of nose, eyes, lips and face. In the beginning, only this criterion was used for the purpose of human taxonomy. The

morphological traits have polygenic inheritance, where genotype-phenotype relationships are not clearly known. These characters are adaptive in nature, and that is a fundamental criticism used against these traits to measure genetic distance between human populations. Oliver and Howells (1957) emphasised the use of metric traits and morphological averages as an exploratory device in human taxonomy. The morphological traits fall into two major categories: 1) Somatoscopic traits, which do not easily lend themselves to exact measurement and based on visual observation alone and 2) Anthropometric traits, which can be exactly measured based on standardized methods, like stature, head length, head breadth and other body measurements.

3.2.1 Skin Colour

The most visible characteristic is skin colour and has been extensively used as a racial characterisation. Skin colour determines the amount of skin pigments like melanin, melanoid, carotene and factors like haemoglobin, oxyhaemoglobin and optic effect due to scattering. The amount of melanin present is the major factor for the colour of skin, hair and eye, produced by specialised cells called melanocytes. In skin, after formation, most of the melanocytes come to rest in the germinative layer of the epidermis where they form melanin and distribute to the numerous cells around them. Spectrophotometry technique is used as an accurate measurement of reflected skin colour. One can use colour charts available with paint companies and dyers for subjective skin colour determination. Body parts exposed to direct sun light will result in tanning of pale skin. A number of genes are known to determine skin/hair/eye pigmentation and these genes are: Albino - *TYR*, Brown *TYRP1*, Pink-eyed dilution- *OCA2*, under white -*SLC45A2*, Ocular albinism - *SLC24A5*, Extension/recessive yellow - *MC1R* (melanocortin 1 receptor), Agouti - *ASIP*, Steel - *KITLG*, *IRF4*, *SLC24A4*, *TPCN2*.

Global distribution of skin colour reveal that different human populations of the world may be classified into three major groups:

- **White Skinned People or Leucoderms**: This category includes Europeans, some groups of Western Asia or Near East, Polynesians, North Africans, where the skin colour varies from white to light brown.
- **Yellow Skinned People or Xanthoderms**: They exhibit yellowish tinge in their skin. They include Asiatic Mongoloids, Bushmen, Hottentots and Armenoids.
- **Black skinned People or Melanoderms**: They are characterised by black skin colour and are represented best by Negroes.

3.2.2 Morphological Characteristics of Hair

In humans, scalp hairs are generally shed every two to four years, while body hairs are shed more frequently. The number of scalp hairs averages 100,000–150,000. Hair grows about half an inch (13 mm) per month, but not all areas of the head will necessarily grow hair to the same final length.

Hair Colour

Majority of people have darker shades of hair colour. Different shades of colour for hair range from jet black to iron grey and snow white. Blonde and red shades are predominantly found in the Western Europe. There is a gradient of increasing blondness from South to North Italy. Red hair varies from a deep orange-red

through burnt orange to bright copper. It is characterised by high levels of the reddish pigment pheomelanin and relatively low levels of the dark pigment. Scotland is the country with the highest content of red haired people, as about 13% of them have red hair. The genetics of red hair was first discovered in the year 1997. It has been discovered that the changes in the gene melanocortin-1 receptor (MC1R), found on chromosome 16 is responsible for producing this hair colour. The MC1R is a recessive variant gene. The dark hair colour shades vary from various shades of brown to black.

Hair Texture

Hair texture is traditionally divided into three categories: 1) coarse, 2) medium and 3) fine. Coarse hair, such as that of the scalp, contains an additional inner core called the medulla. Microscopic studies have been done on the thickness of hair shaft. Coarse hair has the widest diameter and very fine hair has the narrowest.On the basis of such studies, Professor S. M. Garn found that that diameter of fine hair is =56μ; medium hair 57- 84μ and of coarse hair 85μ and above. The white-skinned people have average hair shaft diameter less than 70μ, whereas Mongoloids have between 90 and 100 μ.

Hair Form

There are about 12 types of head hair forms: Straight, slightly wavy, long wavy, wide wavy, narrow wavy, curly, crinkly, loose woolly (matted), tight woolly or frizzly, tufted, peppercorn, spiral. These categories have been broadly categorized under three major groups:

- **Leiotrichous**: These are further of three types: a) stretched- thick straight hair; b) smooth- thin straight hair; c) flat or slightly wavy- waves having wave length between 5.5 and 6 cm. Such hair are found in the Mongoloids, Amerindians and Eskimos, Polynesians and Ainus.
- **Cymotrichous**: These can be categorized into: a) Broad wavy- having smaller radius varying from 3.5 to 4 cm.; b) Narrow wavy- short and strongly curved waves having wave length of about 2.5 cm.; c) Curly- broad spirals having waves in different planes. These types of hair are found among people from Western Asia, The Veddas of Sri Lanka, Australians, Indo-Afghans, Indonesians, Ethiopians and Europeans in general.
- **Ulotrichous or Woolly Hair**: These comprise frizly, pepper corn and spirals. These can be divided into five categories: a) Frizzly- irregular waves in different directions; b) Loose frizzly- circular or flat spiral of about 1.5 cm. in diameter; c) Thick frizzly- circular and flat spirals having about 7-10 mm. diameter; d) Pepper Corn or Filfill: This type has knots of thick rolled hair; e) Spiral: This type consist of hair having very narrow spirals of thick twisted hair of small length. It is generally difficult to distinguish between the last two categories. Such types of hair are found among the Negroes, Andemanese, Bushmen, Papuans, Melanesians, Sudanese and Bantus. The curliest hair is found in the Khoisans whose hair is often so tightly curled that it is called peppercorn hair because it looks like pepper corns placed on their heads. Christiano et al. (2008) have recently demonstrated that mutations in a gene, known as P2RY5, cause hereditary "woolly hair"- hair that is coarse, dry, tightly curled and sparse. Incidentally, it is the first discovery of the new gene whose primary function seems to be the determination of hair texture in humans.

Hair Quantity

Based on visual observations, hair quantity is denoted under three groups: scanty, medium and rich. Observations on head hair should be accompanied by those on body, beard and moustaches. Caucasians (Armenians & Georigians) and Arabs have extremely heavy body hair; Mongoloids have sparse body hair, beard and moustaches; while Negroid varies from sparse to intermediate position. Human head hair show a wide range of variation. So weight of hair is considered more suitable criterion for racial classification. Hair weight should be determined after dehydration in a desiccator.

Hair Limit or Hair Slope

The anterior and posterior head hair limit on the forehead and nape of the neck is said to be genetically controlled. The frontal hair limit profiling is of two major types: a) U form- resembles letter U, and b) M form or V form-resembles letter M or the central cone or V at the centre of the forehead while two legs are seen in the parietal region. M-form usually occurs in male, while U-form in females. Hair slope on the nape is very much variable.

Hair Whorls

A hair whorl on the occipital region of the head is universally observed in humans. Usually there is a single whorl, but at times there can be more than one whorl. Single hair whorl may be classified as clockwise or anticlockwise.

3.2.3 Morphological Characteristics of Eye

A number of eye characteristics, like eye colour, eye opening and eye fold have been used in describing ethnic groups.

Eye colour

It presents a striking range of variation. The coloured part of the eye is the iris, which surrounds the pupil of the eye and contains muscles which dilate and contract the pupil. The iris has several layers, two of which contain melanin. The variation in eye colour is caused by the nature of pigmentation and iris may or may not be pigmented. If melanin is present in the external layer of the iris then the eye will be brown. If melanin is lacking, the iris will be colourless but perceived as blue. If melanin is present but unevenly distributed the eye is perceived as a brownish green called as olive or hazel. True green eyes are extremely rare, a condition caused by presence of pigment in the external layer of the iris, carotene. The yellowish carotene combined with the blue of an unpigmented iris gives a green tinge. A progressive decrease in the amount of pigment yields a graded series of colours from brown to green and finally to grey and blue. Most people in the world have brown eyes, and non-brown eyes for hunters are advantageous against a snowy or light-coloured background.

Eye Opening

According to anthropological literature eye opening has been examined from two major perspectives;

- ✓ Height of the eye opening: There are three major types- wide, medium and narrow;
- ✓ Eye Slant-This can be straight or horizontal, laterally upwards or downwards.

Eye Fold

Fold of the skin hanging down over the upper eye lid have wide variations. The epicanthic fold does seem to offer some protection against snow blindness, caused by sunlight reflecting from snow. The following variations are generally observed:

- Internal Epicanthic Fold: The inner corner of the eyelid is covered over in this characteristic and this fold makes the inner corner of the lid curve downward.
- External Epicanthic Fold: In this case, the fold hangs down over the outer canthus alone.
- Median Fold: Margins of the upper lid that fall towards both canthi are exposed and the fold hangs over the middle part of the upper eye lid.
- Complete Mongoloid Fold: This folds runs over the entire margin of the upper eye lid, covering both inner and outer canthi.
- Absence of Fold: When there is absence of the upper four conditions.

3.2.4 Morphological Characteristics of Nose

Human nose differs in anatomy and morphology between racial groups. Anthropological literature has given a lot of emphasis on nasal variations among humans by taking a series of measurements of the nose and somatoscopy observations of shape of the nasal profile. Armenians and North American Indians have convex nasal bridge, Australians, Lapps, and Bushmen have concave nasal bridge. The following descriptive observations are made on the nasal morphology:

- Nasal depression: None, shallow, medium, deep;
- Nasal bridge: Straight, concave, convex, concavo-convex or wavy;
- Nasal tip: Sharp, medium, thick, bulbous;
- Nasal septum: Sloping upward, sloping downwards, horizontal;
- Disposition of the nares: High and narrow, medium broad, broad and flaring.

Nasal Index

It is a ratio of nasal breadth to nasal length multiplied by one hundred. P. Paul Broca emphasised the importance of nasal index as the best indicator for ethnic description. Nasal shape is determined from the nasal index value as follows:

Nose Form	Index Range
Leptorrhine (Narrow nose)	< 70
Mesorrhine (Medium nose)	70.0 – 84.9
Platyrrhine (Broad nose)	85.0 – 99.9
Hyper Platyrrhine (Very broad nose)	100 and above

Anthropometric studies have shown that Negroes have a broad and short nose; the Mongoloids have short and moderately broad (mesorrhine) nose. Australoids possess excessively platyrrhine nose. The Whites usually exhibit leptorrhine type of nose. Studies have shown that nasal proportions do vary between ethnic groups but the size and shape of the nose does not define precisely Caucasian, Mongoloids and Negroid races respectively. Anthropologists agree that the nasal variations are due to man's adaptation to the environment. But recent published data on

nasal physiology have not shown significant differences between the ethnic groups despite obvious differences in nasal proportions.

3.2.5 Morphological Characteristics of Lips

Human lips are a peculiar trait that gives an enormous range of oral expressions brought by a complex set of muscles. Human lips are different from those of all other animals because they are everted. Everted lips seem to have a slight ability to help cool the body because capillaries run very close to the surface of the lips, and the slight moistness of the lips helps in cooling by evaporation. The most everted lips are found on the faces of Negroids and the least everted lips on the faces of some Europeans. On the basis of thickness of the lips, these can be divided into four categories: thin lips, medium lips, thick lips, very thick everted lips. African Negroes usually have the last type of lips.

3.2.6 Morphological Characteristics of Face

Human face has many distinguishing characteristics that help in recognising them from each other. On the basis of conformation of the face, hair line, the form of the jaw and the forehead, the facial form is determined. Somatoscopy observations on forehead include height, slope, and width and brow ridges size.

Facial Form or Shape

There are about ten facial types that have been reported: elliptic, oval, reverse oval, round, rectangular, quadratic, trapezium, inverted trapezium and pentagonal. The face usually harmonizes with the form of the head, so that a narrow face accompanies a narrow head. There are notable exceptions, however; for broad faces with long heads occur among sonic Eskimos. Facial form is determined with the help of facial index.

Facial Index = Morphological facial height/ Bizygomatic breadth × 100

This index is divided into five categories:

Face Form	Index Range
Hyper euryprosopic (Very broad face)	upto 78.9
Euryprosopic (Broad face)	79.0 - 83.9
Mesoprosopic (Medium face)	84.0 – 87.9
Leptoprosopic (Narrow face)	88.0 – 92.9
Hyper leptoprosopic (Very narrow face)	93.0 and above

Studies have shown that Armenoids have a long and relatively narrow face. Mongoloids usually have broad face with prominent cheek bone.

Prognathism

Projection of the face is an important criterion of the racial classification. The facial angle indicates that the angle made by the whole face with brain cap i.e. the angle between the horizontal line and the straight-line joining the centre of the chin and the fore head. If the facial angle is 90 it is called orthognathism. Facial prognathism occurs if this angle is less than 83, and between 83 and 90, it is known as mesognathism. Most of the white races are orthognathists, black races are prognathists and yellow races are mesognathists.

3.2.7 Morphological Characteristics of Head

The Cephalic Index

The form of the head is ascertained by measuring in a horizontal plane the greatest length from a definite point on the forehead (the glabella) to the back of the head, and the greatest breadth a little above the ears. The cephalic index is an expression of the breadth of the head or skull in terms of percentage of the length. The difference of the index taken on the living and on the skull is about two units. The head form of skulls is called cranial index. Hence the cephalic index can be converted into the cranial index by the subtraction and vice versa. Formula for calculation of Cranial Index or cephalic index, C.I. = (Maximum Head breadth/ Maximum Head length) ×100. Head shape has been arbitrarily classified, on the basis of cephalic index, into three categories as follows:

Head Form	Index Range	
	Dry skull	Living head
Delicocephalic or long headed	< 74.99	< 76.99
Mesocephalic or mid headed	75-79.99	77-81.99
Brachycephalic or broad headed	80 over	82 over

3.2.8 Morphological Characteristics of Ear

Ears are classified depending on the ear's length and breadth as long and narrow, as found in Mongols; short and wide, as found in Negroes, Negritos, Bushmen and Hottentots. Majority of the people belong to intermediate type. Europeans are the most variable and have ears that span the entire range of human variation. Longest and narrowest ears are found in Australoids, Mongoloids and some Whites. Ear lobe, which is another ear feature, can be free or attached. Europeans and Mongoloids have well developed ear lobes while Negroids have small free lobes. The attached ear lobe is found among Whites and Negroids.

3.2.9 Morphological Characteristics of Body Build

Much variation in body build of humans can be reduced to linear build versus lateral build. Stature may be divided into three categories: short, medium and tall. The extreme linear stereotype is found among tall people of East Central Africa. The chest, shoulder, and hip are very narrow and limbs are extremely long. The extreme lateral stereotype would be found in Asian and Native Americans. Eskimos, Japanese, Samoans, Apache, and many South American Indians exhibit lateral build and a few Caucasoid people of northern Europe. Laterally built people tend to have long and broad trunk, with wider chest, shoulder and hip. The widest hips of all can be found in Europeans. The limb bones tend to be short and less contributed to overall height.

3.3 GENETIC CRITERION OF RACE

After the rediscovery of Mendelism, it was observed that inheritance of traits in human follow Mendelian laws. Morphological traits were found to be adaptive, and hence human taxonomists started using genetic traits to study variations among human populations. The gene frequencies at various polymorphic genetic loci were used to supplement definition of race from morphological characters. Rosenberg *et al.* (2002) have shown that individuals can be assigned to specific

clusters with high degree of accuracy on the basis of human genetic diversity despite the fact that the majority of variation is found within populations. During the first half of the 20th Century, the following genetic markers were used to study differences among human races on the basis of their relative phenotypic frequencies.

3.3.1 Blood Groups

The antigens that express on the red blood cell determine an individual's blood group. On the basis of these antigens, a number of blood group systems have been identified.

ABO Blood Group System

ABO blood group has four phenotypes (A, B, AB, and O). The genes for O and A are widespread among all groups of people on the globe, while B is the rarest allele. 16% of humanity has B allele and about 21% have the A allele and O blood type is very common and about 63% of humans share it. The highest frequencies of A are found in small, unrelated populations, especially the Blackfoot Indians of Montana (30-35%), the Australian Aborigines (many groups are 40-53%), and the Lapps, or Saami people, of Northern Scandinavia (50-90%). The A allele apparently was absent among Central and South American Indians. Type O is particularly high in frequency among the indigenous populations of Central and South America, where it approaches 100%. It is also relatively high among Australian Aborigines and in Western Europe (especially in populations with Celtic ancestors). The lowest frequency of O is found in Eastern Europe and Central Asia, where B is common. Blood type B is relatively common in Chinese and Indians in about 25% of the population whereas it is less common in European countries and Americans of European origin, being found in about 10%. Blood type AB is the least common. Considerable numbers of variants of the A antigen are known, most of which are rare; the B antigen is less variable but several rare variants are known. There are over 20 recognised variants of group A- although about 95% of all A's are A1. Most of the variants are found in Africa, and probably represent adaptations to local parasites. These include A2, A3 and A-Bantu. The highest frequencies of A2 are found in small, unrelated populations, especially the Blackfoot Indians of Montana (30-35%), the Australian Aborigines (many groups are 40-53%), and the Lapps, or Saami people, of Northern Scandinavia (50-90%).

Rh Blood Group System

From the clinical point of view the Rhesus or Rh system is the most important system other than ABO. Rh D blood group has two phenotypes: Rh D positive (Rh+) or Rh D negative (Rh-). Studies have shown that most African populations are around 75% Rh+. Europeans have the lowest frequency of this blood type for any continent; Rh+ is around 60%. The lowest known frequency is found among the Basques of the Pyrenees Mountains between France and Spain where it is only 47% Rh+.

The complexity of the Rh blood group antigens begins with the highly polymorphic genes that encode them. There are two genes, RHD and RHCE that are closely linked. Numerous genetic rearrangements between them have produced hybrid Rh genes that encode a myriad of distinct Rh antigens. To date, 49 Rh antigens are known. The most common Rh haplotype in Caucasians, Asian Mongoloids, and Native Americans is DCe.

Frequency distribution of various Rh antigens among different races is as follows:

D: 85% Caucasians, 92% Blacks, 99% Asians

C: 68% Caucasians, 27% Blacks, 93% Asians

E: 29% Caucasians, 22% Blacks, 39% Asians

c: 80% Caucasians, 96% Blacks, 47% Asians

e: 98% Caucasians, 98% Blacks, 96% Asians

Frequency distribution of various Rh haplotypes among different races is as follows: Rh haplotype DCe: most common in Caucasians (42%), Native Americans (44%), and Asian Mongoloids (70%); Rh haplotype Dce: most common in Blacks (44%); Rh D-negative phenotype: most common in Caucasians (15%), less common in Blacks (8%), and rare in Asian Mongoloids (1%).

MN Blood Group System

The frequencies of the M and N genes of the MN system have been found to be closely similar up to 50 per cent. There are three phenotypes: M, N and MN with specific variations. Australians have low frequency of M blood group, while American Indians have low N blood group. MN blood group phenotype frequencies among Caucasians are: 0270 (MM), 0.540 (MN) and 0.189 (NN). S and s antigens were discovered in 1947 and 1951 for a model of closely linked genes, two closely linked loci for CE/D loci of Rh blood group system, one determining the alleles M and N and the other S and s under MNSs system. Thus there are four haplotypes: MS, Ms, NS, and Ns. Under this system many new antigens have been found, but the Henshaw or He antigen, has great anthropological value, for it appears to be totally limited to populations of African ancestry.

Duffy Blood Group System

The Duffy blood group was discovered in 1950. The allelic genes Fy^a and Fy^b account for all the phenotypes under this system. The Duffy null phenotype, Fy(a-b-), is rare among Caucasian and Asian populations, a common phenotype in Blacks (2/3rds). Fy allele has a frequency of 0.03 in Caucasian populations and 0.939 in African Negro populations, while Mongoloids have a frequency of 0.0985. Frequency of Fy^a allele is 0.9015 in Mongoloids from China, 0.0607 in African Negroes and 0.42 in Caucasians. Frequency of the other allele Fy^b is 0 in Mongoloids from China, 0 in African Negroes and 0.5492 in Caucasians. The racial variation in the distribution of Duffy antigens is a result of a positive selection pressure, because the absence of Duffy antigens on RBCs makes the RBCs more resistant to invasion by a malarial parasite.

Table 3.1: Summary of blood group variations (in %) among human populations

Population	A1	A2	B	O	Rh -	Duffy +
Caucasians	5- 40	1- 37	4- 18	45- 75	25- 46	37- 82
Negroes	8- 30	1- 8	10- 20	52- 70	4- 29	0- 6
East Asians	0- 45	0- 5	16- 25	39- 68	0- 5	50- 100
American Indian	0- 20	~ 0	0- 4	68- 100	~ 0	22- 99

The blood group variation among humans provides a useful opportunity to examine definition of race in terms of gene frequencies in populations rather than in terms of the characteristics of an isolated individual.

3.3.2 Other Genetic Traits

Ear Wax

The consistency of ear-wax is found to be under genetic control. Cerumen (ear-wax) may be wet (sticky) or dry (hard); the types are controlled by a pair of allelic genes, that for the wet type expressing itself dominantly in relation to that of dry. The distribution of the alleles, showed that wide variations in gene frequencies throughout the world, the dry allele being predominant in the Mongoloid peoples; wet allele in Caucasoids and absent in Negroids. The percentage frequency of gene bearing dry wax in some populations is as follows:

Mongoloids = 92-98%, Melanesians = 53%, Micronesians = 61%, Whites = 15 - 20%, and Negroes= <10%.

PTC Tasters and Non-tasters

The majority of people in any population can taste phenylthiocarbamide (PTC) bitter. The ability to taste these substances was shown by Blakeslee and Salmon (1931) and by Snyder (1932) to behave as a Mendelian dominant character. The lowest frequency of PTC non-tasters is seen among Australian aborigines (50 – 70%) and the highest among Mongoloids (83 -100%) and Negroids (90- 97%).

Amino acid Excretion in Urine

Urine is an indicator of internal body chemistry. Since the simultaneous discovery by Crumpler et al. (1951) and by Fink et al. (1951) that a particular amino acid, Beta-aminoisobutyric acid (BAIB), may be excreted in large quantities in the urines of certain individuals. Several investigators have shown that this trait as characteristic of individuals and largely independent of environmental factors. For example, beta-amino-isobutyric acid (BIAB) is rarely excreted in large amounts by Europeans, while excess excretion is common in Mongoloids. Harris (1953) classified individuals as “excretors” or non-excretors” and found that the frequency of “excretors” was 9.6 per cent in the United Kingdom and suggested that the trait was under genetic control. Differences among races have been observed from the urine-analysis for subtle and non-pathological traits.

Dermatoglyphics

Dermatoglyphic patterns of fingers, palms and soles have been extensively analysed to study racial variations. Dermatoglyphic patterns are present at birth and do not change throughout the remainder life.

The patterns present on finger tips are loops, arches and whorls. The similarity of patterns of two individuals can be used as an index of similarity. The data in Table 3.2 shows preponderance of loops in Caucasoids and African populations, while Mongoloids have more whorls than loops.

Table 3.2: Frequency of Fingerprint patterns in different populations

Population	Arches	Loops	whorls
European	0- 9	63- 76	20- 42
Negroes	3- 12	53- 73	20- 40
Bushmen	13- 16	66- 68	15- 21
Mongoloids	1- 5	43- 56	44- 54
Australian aborigines	0- 1	28- 46	52- 73
Micronesians	2	49	49- 50

Pattern intensity index is the number of tri-radii present on finger ball patterns. Among Whites, Nordic subgroup shows low pattern intensity; while Mediterraneans show higher intensity and Alpines are characterised by intermediate value of the index. Arabs, Syrians, Indians and Jews have slightly higher pattern intensities than Europeans.

3.4 SUMMARY

Morphology and Race

The Mongoloid race, including most people of East Asia and the indigenous people of America, has been described as having saffron to yellow or reddish brown skin colour, medium stature and a broad head form. The head hair is dark, straight, and coarse; body hair is sparse. The eyes are black to dark brown. The epicanthic fold, imparting an almond shape to the eye, is common, and the nose bridge is usually low or medium. Fold of the upper eyelid, which protects the eyes from the strong winds and sandstorms are characteristic of a dry, continental climate with sharp diurnal and seasonal variations in temperature. Mongoloids, most numerous of the present day populations, split into three groups: the Eastern Siberians, Eskimos and the Northern American Indians; the Japanese, Koreans, Chinese; the Indonesians and Malays.

The Caucasoid, found in Europe, North Africa, and the Middle East to North India, is characterised as pale reddish white to olive brown in skin colour, of medium to tall stature, with a long or broad head form, vertical or sloping forehead. The hair is light blond to dark brown in colour, of a fine texture, and straight or wavy. The colour of the eyes is light blue to dark brown and the nose bridge is usually high. Pinna is of medium size. Three major subdivisions of the Caucasoids are: the Nordic, the Mediterranean and the Alpine.

Australoids are characterised by dark wavy or curly hair, sometimes quite abundant growth of beard and body hair, dark skin (olive shades), low forehead, relatively broad nose, and thick lips. They include the Aboriginal peoples of Australia along with various peoples of Southeast Asia, especially Melanesia and the Malay Archipelago.

The Negroid race is characterised by brown to brown-black skin, usually a long head form, varying stature, and thick, everted lips. The hair is dark and coarse, usually kinky. The eyes are dark, the nose bridge low, and the nostrils broad. Forehead is straight and high. Face has the features of prognathism. Chin is not well developed. To the Negroid race belong the people of Africa south of the

Sahara, the Pygmy groups of Indonesia, and the inhabitants of New Guinea and Melanesia (www.babynamesworld.parentsconnect.com).

Blood Groups

Blood groups are determined by red cell antigens on the surface of the blood cells. The patterns of ABO, Rh and Diego blood type distributions are not similar to those for skin colour or other so-called "racial" traits. The plausible explanation is that the specific causes responsible for the distribution of human blood types have been different than those for other traits that have been commonly employed to categorize people into "races."

ABO Blood Group System

Overall in the world, B is the rarest ABO blood allele as only 16% of humanity has it. About 21% of the people have the A allele. The O blood type (63%) is very common around the world. A_2 allele has the highest frequency (1-37%) among Caucasians, while lowest (0%) among Australoids. Among Negroes and Mongoloids, A_2 allele frequency is low (0-5 %). Frequency of B allele is highest in Mongoloids (16-25%).

Rh Blood Group System

Frequency distribution of various Rh haplotypes among different races is: Rh haplotype DCe: most common in Caucasians (42%), Native Americans (44%), and Asian Mongoloids (70%); Rh haplotype Dce: most common in Blacks (44%); Rh D-negative phenotype: most common in Caucasians (15%), less common in Blacks (8%), and rare in Asian Mongoloids (1%).

Duffy Blood Group System: The Duffy null phenotype, Fy(a-b-), is rare among Caucasian and Asian populations and common phenotype in Blacks, occurring in over two-thirds of the Black population. Fy allele has a frequency of 0.03 in Caucasian populations and 0.939 in African Negro populations, while Mongoloids have a frequency of 0.0985. Frequency of Fy^a allele is 0.9015 in Mongoloids from China, 0.0607 in African Negroes and 0.42 in Caucasians. Frequency of the other allele Fy^b is 0 in Mongoloids from China, 0 in African Negroes and 0.5492 in Caucasians.

Ear Wax

The dry allele being predominant in the Mongoloid peoples; wet allele in Caucasoids and absent in Negroids. The percentage frequency of gene bearing dry wax in some populations is as follows: Mongoloids = 92-98%, Melanesians = 53%, Micronesians = 61%, Whites = 15 - 20% and Negroes= <10%.

Major Human Races

Coon (1965), by using mixed criteria of morphological traits, blood groups and skin colour, divides human species into the following races: Caucasoid, Mongoloid, Australoid, and Negroid. The Negroid people of Africa (black Africans) were separated into a Congoid race, consisted of sub-Saharan Africa, and a Capoid race, consisting of the Khoisan in Southern Africa (including groups called Bushmen and Hottentot).

Wiener proposed the following racial classification, based largely on ABO and Rh factors: 1) Caucasoid group (highest incidence of Rh-, relatively high incidence

of genes for Rh- and A2, moderately high incidence of all other types); 2) Negroid group (highest incidence of RhO, moderate frequency of Rh-, high relative incidence of genes A2 and the rare intermediate A and Rh genes); 3) Mongoloid group (virtual absence of Rh- gene and gene A2). Using MN data, he then further classified the Mongoloid group into an Asiatic group, a Pacific Island and Australian group, and a group including American Indians and Eskimos (www.dadamo.com).

3.5 GLOSSARY

Allele : alternative form of a gene at a locus.

Cerumen : the waxy substance secreted by glands in the external ear.

Cline : the distribution of a trait or allele across geographical space

Ethnography : the study of the geographical distribution of racial groups and the relationship between them and their environments.

Haplotypes : a series or combination of closely linked loci.

Locus : the position of a gene on a chromosome.

Monogenism : the belief that all human races descended from a common ancestral type.

Polygenism : the theory that all human races descended from two or more ancestral types.

Race : a group of populations of a species distinct from other groups of the same species in some characteristics.

Racialism : the belief in or practice of the doctrine of racism.

Racism : a belief that human races have distinctive characteristics that determine their respective cultures, usually involving a false idea that one's race is superior and has the right to control others.

Species : groups of interbreeding organisms of common descent with certain constant specific hereditary characteristics in common and reproductively isolated from other such groups.

Subspecies : a group of individuals or populations that share a number of characteristics in common and frequently geographically limited.

References

Coon, C.S. 1965. *The Living Races of Man*. New York: Knopf.

Crumpler, H.R., Dent, C.E., Harris, H. and Westall, R.G. 1951. B-*aminoisobutyric acid (a-methyl-0-alanine): A New Amino Acid Obtained from Human Urine.* Nature, 167: 307.

Fink, K., Henderson, R. B. and Fink, R. N. 1951. *B-aminoisobutyric acid: A Possible Factor in Pyrimidine Metabolism*. Proc. Soc. Exp. Biol., N. Y. 78: 135.

Harris, H. 1953. *Family Studies on the Urinary Excretion of P-aminoisobutyric Acid.* Ann. Eugen.,18:43-49.

Oliver, D.L. and Howells, W.W. 1957. *Micro-Evolution: Cultural Elements in Physical Variation*. American Anthropologist, 59: 965–978

Rosenberg, N.A., Pritchard, J.K., Weber, J.L., Cann, H.M., Kidd, K.K., Zhivotovsky, L.A. and Feldman, M.W. 2002. *Genetic structure of Human Populations.* Science 298:2381–2385

www.babynamesworld.parentsconnect.com accessed on April 11, 2011

www.dadamo.com accessed on December 22, 2010

www.thenakedscientists.com accessed on January 14, 2011

Suggested Reading

Boyd, W.C. 1950. *Genetics and the Races of Man. An Introduction to Modern Physical Anthropology.* New York; Little Brown and Co.

Brues, A. M. 1977. *People and Races.* New York; Macmillan

Coon, C.S., Garn, S.M.I. and Birdsell, R. 1950. *Races –A Study of the Problems of Race Formation in Man.* Springfield; Charles C. Thomas.

Coon, C.S. 1965. *The Living Races of Man.* New York; Alfred A. Knopf.

Hooton, E.A. 1947. *Up from the Ape.* New York; Macmillan.

King, James, C. 1981. *The Biology of Race*. Berkeley; University of California Press.

Molnar, S. 1998. *Human Variation: Races, Types and Ethnic Groups.* Upper Saddle River; Prentice-Hall, Inc.

Mourant, A.E. 1983. *Blood Relations; Blood Groups and Anthropology.* Oxford; Oxford University Press.

Sample Questions

1) What is race, how do anthropologists define it? How did the different races arise?
2) Is it true that all human races are equally tall?
3) What are morphological differences among major races?
4) What are genetic differences among major races?
5) Which of the following best defines *cline*?
    a) The distribution of a trait or allele across geographical space
    b) A folk taxonomic category based on biological observations
    c) The existence of two or more distinct phenotypes within a population
    d) A group of local populations.

UNIT 4 RACIAL CLASSIFICATION

Contents

Learning Objectives

After you have gone through this unit, you would be able to:

- comprehend the concept of race;
- elucidate the controversy regarding race terminology;
- understand the factors responsible for formation of race;
- recognise the basis of racial classification; and
- appreciate the racial classification with comparison to physical features of major races of the world.

4.1 INTRODUCTION

Race refers to classification of humans into relatively large and distinct population groups based on appearance through heritable phenotypic characteristics, often influenced by and correlated with culture, ethnicity and socio-economic status. Race is a concept, applied in various senses, even by human biologists. In the present context we are concerned with anthropological or biological concept of race. As a biological term, race denotes genetically divergent human populations that can be marked by common phenotypes.

Among humans, race has no cladistics significance- all human beings belong to the same hominid subspecies, 'Homo sapiens sapiens', each differing from other populations in the relative commonness of certain hereditary trait (www.enotes.com).

Hooton (1926) has defined race in **essentialist concept** as "A great division of mankind, characterised as a group sharing certain combination of features, derived from their common descent, and constitute a vague physical background, usually more or less obscured by individual variations, and realised best in a composite picture."

Mayr (1969) has given the **taxonomic concept** of definition as "A subspecies is an aggregate of phenotypically similar populations of a species, inhabiting a

geographic subdivision differing taxonomically from other populations of the species."

Dobzhansky (1970) has defined race in **population concept** as "Race are genetically distinct Mendelian populations. They are neither individuals nor particular genotypes; they consist of individuals who differ genetically among themselves."

Montagu (1972) has defined race in **genetical context** as "a population which differs in the frequency of some gene or genes, which actually exchange or capable of exchanging genes across boundaries and separate it from other populations of the species."

Templeton (1998) has given the **lineage concept** of definition as "A subspecies is a distinct evolutionary lineage within a species. This definition requires that a subspecies, genetically differentiated due to barriers occurring in genetic exchange that have persisted for long periods. The subspecies must have historical continuity in addition to current genetic differentiations."

In short, the term 'race' is applied to a physically distinctive groups of people, on the basis of their difference from other groups in skin colour, head shape, hair type and physique. Anthropologists take the word 'race' in its zoological sense. "If the people of one race may be distinguished by physical markings, then they constitute a race."

While dealing with the definition of race anthropologists have considered few related facts. For example, national, religious, cultural and geographical inhabited human groups should not be confused with racial groups. The Indians or Pakistanis do not form a race, nor do the Persians or the Germans. These are national or religious groups. In the same way the Dravidians do not constitute a specific race, they are linguistic groups. Therefore one should be cautious enough in applying the term race to a particular human group.

On the other hand, the concept of racial 'superiority' or 'inferiority' has created various problems in human society. This concept is not based on any scientific or anthropological facts. The scientists and anthropologists have never accepted the misconception related to superiority and inferiority of races.

In anthropological sense, the word 'race' should refer to those human populations, who possess well developed, primarily heritable physical differences from other human populations.

4.2 CONTROVERSY RELATED TO TERM RACE

The word race is applied in a variety of ways, various aggressive actions from first-fights to large scale riots and countrywide civil wars- have stemmed from tension and misunderstanding among various "races".

Race science was never just human classification. It presupposed to be a distinctive relationship between "nature" and "culture", by understanding the differences in the nature and to generate different kinds of persons and the distinctive stage of cultures and civilizations that inhabit the world (www.enotes.com).

Craig Venter and Francis Collins jointly made an announcement of the mapping of human genome in 2000. Upon examining the data from the genome mapping, Venter realised that although the genetic variation with human species is on the order of 1-3% (instead of the previously assumed on 1% per cent), the types of variations do not support the notion of genetically defined races (www.enotes.com). Venter stated that 'Race is a social concept and not a scientific one. There are no bright lines to compare all the sequenced genome on the planet". When we try to apply science to sort out these social differences, it all falls apart (www.enotes.com).

Stephan Palmie' asserted that race is not a thing but a social relation or in the words of Katya Gibel Mevorach, "a metonym", "a human invention whose criteria for differentiation are neither universal nor fixed but have always been used to manage difference" (www.familypedia.com). As such, the use of the term "race" must be analysed. Moreover they argue that biology will not explain the reason behind the idea of race.

The 'Aryan race' was supposed to be the group of blond haired, blue eyed, white skinned people, whom Hitler wanted to dominate the world. Technically, Aryans are any people who speak one of the Indo-European languages as Greek, Hindi, Polish, German, Gaelic and English. Aryans speaking these languages have neither blond hair nor blue eyes. On the other hand, Jews do not form a race but a religious group like the Buddhists or the Protestants (www.faculty.mdc.edu).

Another popular belief is that although the races have become "adulterated" through miscegenation (marriage and breeding between different races), even now race mixture is an on going process and as a result the races have got admixture. Hybridization (miscegenation) is one of the factors for race formation and at the same time it plays role in extinction or absorption of racial groups. Therefore, there was never a pure race of man and at present also there is no pure race. The concept of so called 'pure race is based on wrong facts. Again we do not have evidences to say that race mixture produces bad results from the biological point of view.

Racial stereotypes persist largely because the skin colour can be recognised and used to classify people and to attribute certain biological factors to all members of a supposed race. In classifying human races most of the anthropologists do not consider the mental characteristics, viz. IQ. Klinberg has very clearly stated that 'the scientists know no relation between race and psychology'.

The term 'race' has often been used by certain individuals to justify their exploitation of other groups. A blatant example of how racism is linked to inaccurate concepts of race was found in the treatment accorded to American blacks because of a belief in blacks' inherent (genetic) inferiority to whites. The concept of racial superiority and inferiority is not based on any scientific facts. This racist outlook may be a remnant of slavery days.

Sometimes, few controversies related to cultural traits and a term race also arises. Cultural traits may be acquired by one in his time but not the racial strains. Certain populations of Northeast India have adopted western culture, but not their physical features. Their cultural traits may mislead one; but not their physical feature. However, admixture at the biological level brings changes in the racial types also. Like cultural traits, racial traits are also changeable. But the cultural traits and the term race is not related on any scientific basis.

4.3 FORMATION OF RACES

Race formation is a complex process where several factors are involved. These may be summarized as:

1) **Mutation**

The basic mechanism by which genetic variability is introduced is through mutation. Mutation is a sudden change in genes resulting in hereditary variation. As soon as a new mutant gene appears, it multiplies from one generation to another and becomes a distinctive characteristic of the particular population, provided other conditions are favorable. In this sense mutation is an important process through which races are formed.

2) **Natural selection**

Natural selection is an important factor that operates to pattern and maintain inter and intra specific variability, when applied at the genetic level to the alleles operating at individual loci, as it predicts the behavior of genes under specific conditions. Selection moulds the genotypes of an organism such that they produce phenotypes fitting to the environment in which organism lives. But natural selection does not operate directly on the genotypes; it acts through the phenotypes of the individuals and their gametes. With natural selection advantageous genes are multiplied more rapidly than the disadvantageous genes, as the latter will be eliminated by nature.

3) **Genetic Drift**

Chance fluctuations of gene frequencies may lead to appreciable genetic differences between completely isolated sub-populations. This effect becomes stronger, if the effective breeding size of population is small. There may be lessened variability owing to the random loss of alleles for a predictable proportion of genes. In this process, increase or decrease of the frequency of a gene in a certain population does not depend upon advantageous or disadvantageous conditions of life in a particular locality, but happens merely as an accident or chance. The different frequency of gene for tasting or not tasting PTC in different populations forms a good example of accidental fluctuation of genes.

4) **Migration**

Migration plays an important role in racial differentiation. It helps in isolation, hybridization and mixing of different populations with the migrants. Groups of people migrate from mother population to different directions from the common centre and become isolated from one another and due to endogamy, pressure of natural selection and process of hybridization may cause formation of races.

5) **Isolation**

Isolation may be geographical or social and is considered to be a great race maker. The natural selection and genetic drift, will act effectively only when a particular population is isolated from the neighbouring populations.

On the other hand, people migrated in groups acquire new traits that appear through mutation. Some of the traits being selected by nature become adaptive to particular sets of conditions, thus forming new gene pools. As isolation increases, the possibility of intermarriages among groups' decreases, thus introducing new genes transmitted from generation to generation by the process of heredity resulting in new racial strains.

6) **Hybridization**

Hybridization is a process by which genes within a species are introduced into other populations resulting in genetic combinations which are entirely new. Through hybridization, genetic variation is introduced in a population called as gene flow that leads to the formation of new race. For example, the mingling of Americans and Negroes has produced a new racial population, an ongoing process.

7) **Sexual selection**

It is a process of selecting mates on the basis of some preferred qualities, as a result of which the sexually preferred type would become the dominant variety of the individuals. For example, in a population where blue eye colour was preferred to brown colour, the brown coloured individuals would get lesser and lesser number of mates. Ultimately the gene of brown eye might be eliminated by this process or, the blue-eyed would marry blue eyed and brown-eyed would marry brown-eyed. In such case two distinct types of subgroups would be formed.

8) **Social Selection**

In social selection, breeding is regulated by artificially instituted barriers between socially approved individual and groups within a population, so that mating occurs between individuals preferred by such social standards rather than at random. In such situations strong isolating mechanisms are developed which in due course may produce modifications in a population.

Thus, it may be stated that mutation, natural selection, genetic drift, migration, isolation, hybridization, sexual selection and social selection, etc., are the main processes responsible for the formation of racial strains.

4.4 BASIS OF RACIAL CLASSIFICATION

Racial classification is given to a group of individuals, who share a certain number of anthropological traits, which is necessary such that they are not confused with others. There are two aspects to distinguish people based on phenotypic and genotypic traits.

1) **Phenotypic Traits:** Phenotypic traits are those physical characteristics of an individual, which may be examined:

These are of two types:

- Indefinite Physical (Phenotypic) Traits and
- Definite Physical (Phenotypic) Traits

Indefinite Physical (Phenotypic) Traits

Those physical traits which are observable but immeasurable to any measurement are called indefinite physical traits, such as the colour of skin, hair and eyes. Hence they can only be described. Following are some of the indefinite physical traits:

- **Skin Colour:** From the very beginning, anthropologists have used skin colour as one of the most important distinguishing characteristic. Usually, on the basis of skin colour people differentiate between the white, yellow and black races. Recently, Spectrophotometry has been made as the basis of an objective and accurate measurement of the colour of the living human skin. Of the colour of the skin the following distinctions are made:
  - White skinned people or Leucoderms, e.g. Caucasian
  - Yellow skinned people or Xanthoderms, e.g. Mongolian
  - Black skinned people or Melanoderms, e.g., Negroes
- **Hair:** In racial classification, the characteristics of hair, viz., hair form, colour, texture and abundance have been most frequently observed. Besides, cross section and hair whorls have also been used in certain studies. All these hair traits are well defined and classified by anthropologists.
- **Eye:** The characteristics of the eye, particularly the eye opening, eye fold and eye colour have been utilised in distinguishing the racial groups.
- **Nose:** Nose is an integral part of the face and an independent entity whose attributes are comparable. Mainly, the descriptive elements of the nose may be observed and recorded in the following manner:

  Nasal depression : None, shallow, medium, deep

  Nasal bridge: Straight, concave, convex, Concave-convex

  Nasal tip: Sharp, Medium, thick, bulbous

  Nasal septum: Sloping upward, horizontal and sloping downward.

  Disposition of the nares: High and narrow, medium broad, broad and flaring.
- **Lips:** In humans, lips bind the oral fissure or the mouth opening. This trait is peculiar in man. It is generally observed that changing moods affects the position of the lips in four different ways: open and shut, foreword and backward, up and down, tense and slack on the basis of thickness of the lips, anthropologists distinguished humans into four groups, viz., thin, medium, thick and very thick lips.
- **Face form:** Human face has distinguishable characteristics, which help us to identify individuals. On the basis of conformation of the face, predominantly the hair line, the form of the jaw and the forehead, the form of the face may be determined. Poch has distinguished ten facial types, viz., elliptic, oval, reversed oval, round, rectangular, quadratic, rhombic, trapezium, inverted trapezium and pentagonal (quoted by Comas, 1960)

- **Ear:** Ears are individually characteristic and have a number of peculiarities in ear forms. The external ear form may be classified into six types, viz., macaques form, cercopithecinae form, Darwinian point, Darwinian tubercle, vestigial Darwinian tubercle and without Darwinian tubercle.

- The ear lobes are one of the most important features of individual characteristic. The ear morphology varies on the basis of ear lobe. The ear lobe is much developed in European and Mongoloids. The attached ear lobe is more primitive feature than the free lobe.

Definite Physical (Phenotypic) Traits

Definite physical traits are those, which can be measured with the help of anthropological methods and instruments. In brief, the following are definite physical traits:

- **Stature:** Different races are distinguished on the basis of differences in stature. Martin has classified stature in the following manner:

Pygmy	Upto	129.0 cms.
Very short	130.0	149.9 cms.
Short	150.0	159.9 cms.
Below medium	160.0	163.9 cms.
Medium	164.0	166.9 cms.
Above Medium	167.0	169.9 cms.
Tall	170.0	179.9 cms.
Very tall	180.0	199.9 cms.
Giant	200.0	and above

- **Head form:** Anthropologists have adopted a method for classifying the head form based on the ratio of the maximum breath and maximum length expressed as cephalic index. On the basis of cephalic index, head is classified into three classes, i.e., Dolicocephalic, Mesocephalic and Branchycephalic.

- **Nose form:** The nasal index is a good indicator to know the dimension of the nose. It is the proportion of the width of the nose to its length. Broca consider it as the best indicator in racial determination. Human population may be conveniently classified on the basis of nasal index as follows:

– Leptorrhinae upto	70.9
– Mesorrhinae	71 to 84.9
– Chamaerrhinae or Platyrrhine	85 to 99.9
– Ultra Chamaerrhine	100 and above

- **Face form:** The proper evaluation of the face form can be possible with the help of Facial Index. It is an indicator of the proportion of the facial length to its breadth. The human populations may be conveniently classified on the basis of facial index as follows:

- Hypereuryprospic upto 78.9
- Euryprospic 79 to 83.9
- Mesoprospic 84 to 87.9
- Leptoprospic 88 to 92.9

- **Ear form:** On the basis of the ratio between ear length and breath the ears has been classified into long and narrow in Mongoloid, short and wide in Negroes. The majority belongs to the intermediate type. Few other biometric measurements are also applied in racial classification.

- **Other definite traits:** There are various anthropometric measurements, which are used in racial classification, viz., bizygomatic breadth, proportion of limbs, chest and thigh circumference, etc.

2) **Genotypic Traits:** A new approach to classify human races is based on some genetic traits. The genotypic traits are as follows:

- **Blood Groups:** The Blood groups (ABO, MN, Rh, Lutheram and Kid blood groups, Duffy Blood Group, P Blood Group and ABH secretor status. etc.) are used in racial classification. There are about a dozen blood group systems known to us, each inherited independently. Their frequencies vary in different populations all over the world; these are used as genetic markers.

- **Dermatoglyphics:** The dermatoglyphics traits are used in racial classification. Each dermatoglyphic trait is inherited independently or polymorphically. These traits are not modified by environmental factors. In fact, Dermatoglyphics (Derma=skin; Glyphic=Carve) is the study where the ridge patterns on the skin of the fingers, palms, toes and soles are considered. The Dermatoglyphics trait include finger pattern types, Pattern Intensity Index, Pattern size, Palmar main line formula, Configurational area (Thenar interdigital area, Hypothenar area, Second, third, fourth, interdigital areas), Main Line Index, Palmar and finger - ridge counts, atd angle, etc.

- **Hemoglobin variants:** The hemoglobin within the red cell also has its own variations in different populations of the world. The sickle-cell hemoglobin or hemoglobin S, Hemoglobin C, Hemoglobin D, hemoglobin E, Glucose-6-phasphate dehydrogenase (G-6 PD), Haptoglobins, Transferrins may be used in racial classification.

- **Some other variants:** The ability to taste phenyl thio-carbamide, colour blindness, sweet glands, etc., are used for the racial classification.

- **DNA finger prints:** The proper evaluation of racial classification can be possible with help of DNA finger printing. The genome of various populations may be used for such purpose.

4.5 RACIAL CLASSIFICATION

Different ethnologists have classified human races differently. Of these few most important are as follows:

The very first attempt to identify the physical features of some human populations is found in ancient Sanskrit literature. The dark complexion Nishads (Australoids) were distinguished from the yellow coloured Kiratas (Indo-Mongoloids). These two were again different from the light coloured Indo-Aryans.

In 200 B.C., the Chinese distinguished mankind into five groups on the basis of skin colour and Egyptians into four racial types.

Bernier's attempt to classify humans may be considered as the first attempt to classify human race in to four groups. In 1921 Bradley made another attempt to systematize the racial types using dichotomous method and distinguished into three racial types, i.e., White (Bearded and Beardless); Negroes (Straight haired and Woolly Haired), Intermediates (Mulattoes).

Linnaeus (1958) introduced binary nomenclature and proposed a systematic classification of human species, Homo Sapiens into six subdivisions, viz., Homo ferus (Savage), Homo Americans, Homo europeans, Homo asiaticus, Homo asser (Negro) and Homo monstrous (abnormal).

In 1775 Bluemenbach, a German scientist studied the craniological material and classified mankind into five types: 1) Caucasian, 2) Mongolian, 3) Ethiopian, 4) American, 5) Malayan.

In 1848 Pickering identified eleven human races, viz., Mongolian, Malay-Polynesian, Australian, Papuan, Negrito, Hindu, Nubian, Hottentot, Abyssinian and White.

In 1870 Huxley proposed a classification of mankind including five principle races divided into fourteen secondary races. Later on Haeckel Muller (1879), Topinard (1885) and Quatrefages (1889) further slightly modified Huxley's classification.

Denikar's Classification

In 1889 Deniker proposed a classification and divided mankind into twenty one races depending on hair form and chose nose form and skin colour as secondary traits. This classification is classic and widely accepted scheme. The brief description of this classification is as follows:

1) Woolly Hair, Broad Nose: This group include Bushmen, Negrito, Negro Bantu, Melanesian-Papuan, on the basis of their skin colour they may be further classified into.

   a) Yellow skinned: They are streatopygous, short statured and dolichocephalic like Bushmen.

   b) Dark skinned: They may be further classified into three groups:

      - Reddish Brown: They are very short statured, subbrachycephalic or subdolichocephalic like Negrito Negrillo.
      - Black, tall statured, dolichocephalic like Negro Bantu.
      - Brownish black, medium statured, dolichocephalic like Melanesian - Papuan.

2) Curly or wooly hair: This group include people with dark skin grouped into three categories:

i) Reddish Brown, narrow nose, tall statured, dolichocephalic represented by Ethiopians.

ii) Chocolate-brown, broad nose, medium stature and dolichocephalic represented by Australians.

ii) Brownish Black, broad or narrow nose, short stature, dolichocephalic like Dravidians. In addition to these another group with tawny white skin, narrow hooked nose with thick tip, branchycephalic represented by Assyroids are also included in this group.

3) Wavy Brown or black hair and dark eyes: This group of people includes:

i) Indo-Afghan having brown skin, black hair, narrow nose, which may be straight or convex, tall stature and dolichocephalic.

ii) Another group of people have tawny white skin, black hair, tall stature, elongated face represented by Arab or Smite, Berber, Littoral European, Ibero-Insular and Western European and Adriatic.

4) Fair, wavy or straight hair, light eyes, reddish white skin: This group of people includes Northern Europeans and Eastern Europeans.

5) Straight or wavy hair, dark black eyes: This group includes Ainu, Polynesians, and Indonesians.

6) Straight hair: This group includes diversified people such as South Americans, North Americans, Central Americans, Petagonians, Eskimos, Lapps, Ugrians, Turks and Mongols.

Hooton's Classification

In 1931, American anthropologist, E.A. Hooton has suggested a four fold classification of composite races, which is the result of cross breeding amongst the primary races. In 1947, however, he modified his classification

1) **White** (European, Eur-African, caucosoid): This group includes six primary and two composite sub races. The primary sub-races include Mediterranean, Ainu, Keltic, Nordic, Alpine and East Baltic while composite sub races include Armonoid and Dinaric.

2) **Negroid:** This group includes African Negro, Nilotic Negro and Negrito (Pygmies) belonging to the primary sub-races.

3) **Mongoloid:** This group include Classic and Arctic Mongoloid (Eskimoid), Primary sub-races.

4) **Composite Races:** This group further classified into three categories:

i) Predominantly White – This group includes Australian, Indo-Dravidian and Polynesians.

ii) Predominantly Mongoloid – This group includes American Indian and Indonesian Mongoloid or Indonesian-Malay.

iii) Predominantly Negroid – This group includes Melanesian Papuan or Oceanic Negroids, Bushmen - Hottentot and Tasmanians.

Hooton's classification has been criticized for the inclusion of Negrito or Pygmy element into the formation of Indo-Dravidians, Tasmanians, Bushman and Indonesians inclusion of Archiaic types, viz., Tasmanians and Bushman as hybrid group and the origin of Dinaric and Armenoid sub-race.

Coon, Garn and Birdsell's classification

In 1950, Coon, Garn and Birdsell set up six putative stocks. In fact, they realised that the existence of three major races (Negroid, Mongoloid, and Caucosoid) is proposed by the most anthropologists. However, some preferred to add the Australoid as a separate group and felt that American Indians and Polynessias should thus be the other group. On a detailed consideration the three investigations preferred to have a "functional classification" and while doing so they considered the following anthropological observations:

1) Differences in tooth and jaw size, skull thickness, brow-ridge size and other archaic features.
2) Body built as adaptation to environment.
3) Special surface features like skin colour, flatness of face, hair distribution, etc., which are adaptations to heat, light and cold.

On the above basis, Coon, Garn and Birdsell were able to distinguish 30 racial types. Though in terms of methodology, this attempt was certainly a positive advance but a determination of primitive or adaptive nature of particular feature was not easy, which give rise to criticism.

Ottenberg's classification

Ottenberg's was the first scientist to attempt racial classification based on blood group, ABO system. In 1925, he classified mankind into six groups, viz., Europeans, Intermediate, Hunan, Hindu, Manchu, Afro-Malaysian and Pacific-American. Later Snyder (1926) proposed a new classification with seven groups, viz., European, Intermediate Hunan, Hindu-Mancho, Afro-Malaysian, Pacific American and Australian.

Wiener's classification

Wiener (1946 and 1948) proposed another classification on the basis of ABO blood groups, MN Blood type and Rh blood factor into six groups, viz. Caucasoid, Negroid, Mongoloid, Asiatic sub group, Pacific Island and Australian, Amerindians and Eskimos.

Boyd's Classification

In 1958, Boyd modified Wiener's classification and proposed six groups comprising thirteen races as follows:

i) **European Group** - (1) Early European (2) Lapps (3) North-west Europeans, (4) Eastern and Central Europeans, and (5) Mediterraneans.
ii) **African Group** - (6) The African races, excluding inhabitants of North Africa, which belong to European group.
iii) **Asian Group** - (7) The Asian races (8) Indo-Dravidian.
iv) **American Group** - (9) American Indians

v) **Pacific Group** - (10) Indonesian race, (11) Melanesian race and (12) Polynesian race

vi) **Australian Group** - (13) Australian aborigines.

Ashley Montagu Classification

In 1951, Ashley Montagu proposed a classification, which was accepted by many anthropologists. He used skin colour, hair form and head form. He classified mankind into three main groups, viz.1) Negroid 2) Mongoloid and 3) Caucasoid.

He further pointed out that another division which is larger than an ethnic group may be distinguished as Australoid, who is in fact archaic.

The physical characteristics of the three major races are as follows:

S.No.	Characters	Caucasoid	Negroid	Mongoloid
1.	Skin Colour	Light reddish white to olive brown. Some are brown	Brown to Brown Black. Some are yellow-brown	Light yellow to yellow brown. Some are reddish Brown.
2.	Head Hair	Light blond to dark brown in colour, fine to medium in texture, straight to wavy in form	Brown-Black in colour, coarse in texture, curly to frizzly or woolly in form	Brown to brown black in colour, coarse in texture, straight in form
3.	Head form	Dolichocephalic to branchycephalic, Height is medium to very high	Predominantly dolichocephalic, Height is low to medium	Predominantly branchy-cephalic height is medium
4.	Body Hair quantity	Moderate to profuse	Slight	Sparsely distributed
5.	Face	Narrow to medium broad	Medium broad to narrow. Prognathism is very often present	Medium broad to very broad. Check bones are high and flat
6.	Eye	Colour is light blue to dark brown	Brown to brown black	Brown to dark brown. Mongoloid eye fold is very often present
7.	Nose	Leptorrhine to mesorrhine, usually bridge is high	Platyrrhine, usually bridge is low	Mesorrhine to playtyrrhine, usually bridge is low to medium
8.	Chin	Usually projecting	Slight	Medium
9.	Lips	Very thin to medium, small aversion	Thick, much aversion	Medium thickness with aversion of membranous often heavy integumented lips
10.	Stature	Medium to tall	Very short to tall	Medium to short
11.	ABO Blood Group	Relatively high incidence of A2	Relatively high incidence of A2, comparatively high incidence of B	High incidence of A1, very low frequency of A2

12.	Rh. Factor	Highest frequency of Rh negative	Moderate frequency of Rh negative	Rh negative is rare
13.	Dermato-glyphics pattern intensity	Low	Great dispersion ranging from higher to lowest	High
	Main Line Formula	11.9.7	7.5.5	9.7.5
	Main line	Marked transversally type-ii of D line termination quite frequent	Longitudinal alignment	Longitudinal alignment

4.6 UNESCO STATEMENT ON RACIAL CLASSIFICATION

The definitions related to race strike a note of discord and there is no opinion expressed in them. Experiencing this difficulty UNESCO organised a conference of all the prominent and eminent anthropologists, sociologists and psychologists in order to determine a single conception of race. The conference proposed the following recommendations related to race:

Fundamentally, the entire human species has one origin and all men are Homo sapiens.

National, religious, geographical, cultural and linguistic groups are entirely unconnected with and unrelated to race. These groups do not give indication of any race. Distinctions can be made between different races on the basis of differences in physical features but not on the basis of cultural characteristics.

The differences that exist between the physical characteristics of men are due both to heredity and to environment. Differences in heredity arise due to the processes known as mutation and inbreeding.

Some race may claim of purity but this not true. Today pure races cannot be found anywhere in the world. The process of mixing of races originated long back.

Human races can be classified but these classifications are based solely on physical traits. They have no relation of any kind with mental or intellectual superiority or inferiority.

The inner capacity for the development of mind and culture is found equally in every race. Hence distinction between races cannot be based on cultural differences and levels of intelligence.

It is possible that in one nation the degree of racial difference may be greater while in another nation lesser degree.

Evidence in support of the fact that the race has no important effect in the social and cultural differences between various human groups has been found in

historical and sociological studies – By no stretch of imagination can one conceive of any relation between changes in racial form and social changes.

That from the biological view point, mixing of races in deleterious, is an essentially incorrect and invalid belief.

In this way, the race is a group of intermarrying individuals, born to common ancestors that possess similar physical traits and a 'we feeling'. Inbreeding renders permanent the physical characteristics of the race and due to them one race can be distinguished from another. One major cause of inbreeding is geographical isolation. Beside geographical isolation a race originates due to mutation, migration, selection and adaptation.

4.7 SUMMARY

To sum up that the word 'race' is applied for human classification on the basis of biological characteristics. Race is genetically divergent among human populations, which is marked by common phenotypes. In other words, race refers to those human groups, which exhibit heritable physical differences from other human populations. Race formation is a complex process where more factors, viz. mutation, natural selection, genetic drift, migration, isolation, hybridization, sexual selection and social selection are involved. The basis of racial classification is various phenotypic traits, viz. anthropometric measurements, somatoscopic observations, etc., and genotypic traits viz. blood groups, dermatoglyphics, hemoglobin variants as well as DNA finger prints.

The various ethnologists have classified human races differently and out of these Deniker's classification, Hutton's classification, Coon, Garn and Birdsel's classification, Ottenberg's classification, Wiener's classification, Boyd's classification and Ashley Montagu classifications are most important. The physical characteristics of the three major races (Caucasoid, Negroid and Mongoloid) vary in respect of skin colour, hair form, head form, face, eye, nose, lips, stature, blood group and dermatoglyphic features.

The UNESCO statement on racial classification stated that fundamentally, the entire human species has one origin and all men are Homo sapiens. The national groups, religious groups, geographical, cultural and linguistic groups are unrelated to race. The variation found to exist between the physical characteristics of men has both the features, i.e. heredity and environment. In short, it may be stated that race is a group of intermarrying individuals, who are born of common ancestors, possess' similar physical characteristics and primarily heritable physical differences from other human populations.

References

Cartmill, M. 1998. *The Status of Race Concept in Physical Anthropology*. Am. Anthropol., 100 : 651-660.

Coon, C.S.1962. *The Origin of Races*. New York; Alfred M. Knopf.

Das, B.M. 2003. *Outline of Physical Anthropology*. Allahabad; Kitab Mahal, 279-385.

Ember, R.C. and Ember, M. 1990. *Anthropology*. Delhi;Prentice Hall of India Pvt. Ltd. 120-127.

Garn, S. 1962. *Human Races*, 2nd Ed. Springfield; C.C. Thomas.

Kumar, Dr. 1992. *Anthropology : Social and Cultural.* Agra; Lakshmi Narain Agrawal Educational Publishers, 104-112.

Majumdar, D.N.1973. *Races and Cultures of India.* Bombay; Asia Publishing House.

Montagu, A. 1972. *Man's Most Dangerous Myth: The Fallacy of Race.* New York; Columbia University Press.

Shukla, B.R.K. and Rastogi, S. 1999. *Physical Anthropology and Human Genetics*: *An Introduction*. Delhi; Palaka Prakashan.

Strkalj, G. 2000a. *Form and Race : Terminological concepts for the study of human variation.* Mankind Quart., 41 : 109-118.

Strkalj, G. 2007. *The Status of the Race Concept in Contemporary Biological Anthropology : A Review.* Anthropologists, 9 : 73-78.

Wolpoff, M.H. and Caspari, R. 1997. *Race and Human Evolution : A Fatal Attraction.* New York ; Simon and Schuster.

www.enotes.com accessed on November 29, 2010

www.familypedia.com accessed on April 11, 2011

www.faculty.mdc.edu accessed on May 15, 2011

Suggested Reading

Brace, C.L. 2005. *Race is a Four-Letter Word : The Genesis of the Concept*. Oxford;Oxford University Press.

Dobzhansky, T. 1968. Discussion, pp.165-166. In : *Science and the Concept of Race*. Eds: M. Mead, T. Dobzhansky, E. Tobach and R.E. Ligh. New Yok;Columbia University Press.

Mohar, S. 1998. *Human Variation: Race, Types and Ethnic Group*. Upper Saddle River; Prentice Hall.

Montagu, A. 1964. *The Concept of Race*. New York; Free Press.

Shukla, B.R.K. and Rastogi, S. 1999. *Physical Anthropology and Human Genetics: An Introduction*. Delhi;Palaka Prakashan, pp 374-450.

Wolpoff, M.H. and Caspari, R. 1997. *Race and Human Evolution : A Fatal Attraction.* New York ; Simon and Schuster.

Sample Questions

1) Define race and discuss controversy related to term race.
2) Discuss the factors responsible for race formation.
3) Describe the basis of racial classification.
4) Discuss the Danikar's/Hotton's/Coon/ Garn and Birdsell's racial classification.
5) Discuss the UNESCO statement on racial classification.