

DEPARTMENT OF ANTHROPOLOGY
B.A and B.SC SEMESTER- IV, PAPER- 7
TOPIC- ETHNIC TYPOLOGY, THE MORPHOLOGICAL AND THE
GENTICAL TRAITS

ETHNIC TYPOLOGY

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 20th century. 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.

Deniker's Classification

In 1889 Deniker proposed a classification and divided mankind into twenty one races depending on hair form and 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: These groups 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 stature and dolichocephalic like Bushmen.

b) Dark skinned: They may be further classified into three groups: • Reddish Brown: They are very short stature, 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 includes 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. iii) 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, brachycephalic 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 Sinite, 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, Patagonians, 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 realized 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 Polynesians 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

Biological Diversity 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

BASIS OF RACIAL CLASSIFICATION

THE MORPHOLOGICAL AND THE GENTICAL TRAITS

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

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, forward 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 **Racial Classification** 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 breadth 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:

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- 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 breadth 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.

THE GENTICAL TRAITS

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

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.

Criteria of Racial Classification

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: 0.270 (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 or He antigen, has great anthropological value, for it appears to be totally limited to populations of African ancestry.

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.

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%).

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. 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 shows preponderance of loops in Caucasoids and African populations, while Mongoloids have more whorls than loops.

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-radial patterns 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.

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-phosphate dehydrogenase (G-6 PD), Haptoglobins, Transferrins may be used in 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.