

# Xanthoderms (ii) causes of variations in skin



Xanthoderms or yellow-skinned people, Mongols are the best representatives, whereas yellowish tinge is always present in the skin colour. Besides them some Tamarinds, Bushmen and Hottentots also show a yellowish touch in their skin colours. Melanoderms or black-skinned people. The Africans fall in this division. Some are really black, others are dark chocolate brown, and some others again show variations in colour.

Papuans, Melanesians, Pre-Dravidians, Australians, etc, may be included in this group. Note: Occupying the same group does not necessarily mean any genetic relationship. For example, though Australian aborigines and Africans may have similar skin colour they are not in any way nearer to one another than either is to the leucoderms or xanthoderms.

**(i) Variation in Skin Colour:**

In the deeper layer of the epidermis lie various granules which make the skin pigmented. Thus with the varying frequencies of the granules, the colours of skin also varies. These variations have some protective value. It protects the melanoderms from the actinic rays of the sun and the leucoderms from cold. In the Old World, at least in the northern hemisphere but not in the New World, a concentration of the darker skinned people is seen in the equatorial regions, while the fairer peoples live away from it.

But this association of various shades of skin with geographic and climatic conditions should not be generalized. Because under more or less similar geographical conditions live the dark-skinned Africans of Congo basin, pale yellow-skinned Pusan of Borneo and cinnamon- coloured people of Amazon Valley.

**(ii) Causes of Variations in Skin Colour:**

It is seen that sunlight and especially ultra-violet rays have direct effect on skin colour. When sun-rays are allowed to fall directly on the skin, the epidermal cells get stimulated to produce more granules, making the skin more pigmented. Therefore, many people thought that Negroes acquired their skin colour from the inherent effect of hot sun. Probably that was not the case. We can explain it in this way. We can assume that the earliest men had neither black nor white skin but of intermediate shade that may be brown or yellow-brown or so.

At this stage the genes for skin colour were changed by mutation producing varieties of skin colour. Those who were best protected from the sunrays were selected by nature and thus gradually became dominant and outlived the rest. Sexual selection also played its role to accelerate the process, which ultimately made that particular group of people black-skinned. 2. Hair Colour: The colour of hair shows a wide range of variation, specialty in Europe and parts of Northern Asia.

Among the Mediterranean hair is of darker colour, while in Northern Europe it is lighter ranging from light brown to reddish colour. Dark hair is common everywhere. It may show brownish or reddish tinge in some parts. It seems that environmental influence of hair colours is not remarkable.

Change in colour with age is an important phenomenon which should be noted. 3. Eye Colour: The pigmentation of iris is responsible for eye colour, therefore, it is also an important feature noted for racial study. It shows a wide range of variation. It may be black, dark brown, light brown, blue

brown, grey brown, green brown, blue or gray. Greatest range of variation is observed among the leucoderms. The Engrains and the Mongols generally show dark brown iris. 4.

**Stature:** Stature deserves careful consideration as racial criteria because it is stated that environment has an obvious effect on stature. Under varied environmental conditions different results are produced. An unfavorable condition of life may temporarily make a people undeveloped, but the same group of people may show increase in stature when subjected to improved and favorable conditions as has been seen in the case of Limousine district of France and the Yuma Indians of Venezuela; Martin has demonstrated that the German youth, being undernourished during First World War and Post-war periods showed stunted stature. It is said that stature is notably influenced by general nutritive conditions and the internal secretions of some glands like pituitary, thymus and gonads.

Experiment on animals has revealed that when the animals are treated under different conditions, unequal body sizes are found. This may probably be applicable to man also.

**(i) Effect of Environment:**

Shapiro in his study of Japanese immigrants into Hawaii has also found an increase of stature under different environmental conditions. Thurston found among the Kannikars that the stature increased in the case of domesticated Kannikars from that of the jungle Kannikars. Sarkar also noticed an increase of stature from the Hill Male stage to the Plains Males. A similar increase of stature is seen among the Garos where the Plains Garos are taller than the

Hill Garos, as has been shown by the present author. Today found that certain Congo Ba Twa pygmies left their forest country and led a settled life practicing agriculture.

After two generations they became significantly taller. Today thinks that free air, sunshine and regular life are the main factors to bring about changes in stature. It is seen that when other conditions are not unfavorable an open wandering habit makes people taller. On the other hand stunted stature is met with among the peoples whose life is hard in infertile, heavy forest or excessively cold country.

Much has been said against these views also. 2. Stature as Heredity: The above facts do not necessarily mean that environment is the only controlling factor, and heredity has no role to play. In the same place two peoples may live side by side with variable statures, like the tall Norwegians and the short Lapps in the north of Scandinavia. Various studies on race-crossing and other things have shown the control of heredity in producing different types of stature. The inheritance of stature follows the general Mendel and rule. Thus it is generally believed that stature is dependent upon an association of par atypical (environmental) and diotypical (hereditary) factor.

It should be borne in mind that every case must be taken by itself. 3. Stature vs. Ethnic Groups: Despite these variations, stature is also employed to characterize various ethnic groups. Stature, however, shows a considerable range of variation within certain limits among the same group of people, for example, a group characterized by short stature, may include some tall stature persons also, and vice versa. 5. Eye: According to Hooton “ only two

sharply contrasted varieties of eyes in modern man—the Mongol eye and the non-Mongol eye.”

**(i) Mongol Eye:**

In typical Mongol eye the palpebral fissure is oblique, the outer angle being higher than the inner angle; the slit or opening of the eye is narrow; and inner epicanthic (epicanthic) or complete Mongol fold is present in varying degrees of development.

As the name implies ' the Mongol eye' is found among the Mongols and people having Mongol features. Typical characteristic of it is shown in varying degrees by the different Mongol peoples. It is said that complete Mongol or inner epicanthic fold has some Mongol or inner epicanthic fold has some Mongol racial significance, while the two other varieties appear to be associated with age factor. The eye-fold is occasionally present in some Africans, specially in Bushmen and Hottentots also. It can be divided into four main varieties: (a) Complete Mongol Fold: In case of complete Mongol fold, a fold skin hangs over the free edge of the entire upper lid and conceals it thoroughly extending from its outer corner to the inner corner. This is very often described as the Mongolian eyelid.

(A) This type of fold is found to occur in different age-groups, i. e., in the young, the middle-aged and the old. (b) Simple Mongol Fold: A very common variety of eye fold is inner epicanthic or epic an\*' or simply " Mongol fold" where the fold covers the free edge of the inner angle of the eye and may extend on to the cheek. This inner epicanthic starts on the inner or medial part of the upper lid. This type of fold is very common in infants and children

and also in the females. Thus it shows variations with age and sex. (B) (c)

External Epicanthic: Another variety of eye-fold is the external epicanthic.

It starts on the middle part of the upper lid and extends below the outer portion of the upper lid cover\* the outer corner of the eye. It is observed more frequently in the middle-aged and elder adult males. (C) (d) Median or Cover

Fold: Sometimes a fold of skin hangs over the middle part of the up lid covering the edge of that region. This type of fold is termed as median or cover fold. This cases both inner and outer corners of eye remain uncovered.

(D)

**(ii) Non-Mongol Eye:**

The typical ' non-Mongol eye' is wide and open and straight.

The eye-fold is not observed this is found to occur in the members of the Caucasian ethnicity. (C) 6. Face: The shape of the face is generally described as oval, round, square or pentagonal, but it is better expressed in terms of the relation of the breadth of the face to its length. The length is measure from nation (upper end of intranasal suture where it meets the frontal bone) to nation (lowest point of the mandible in the median plane) and the greatest breadth is obtained across the cheek bones. The facial index is the length expressed as a percentage of the breadth. The facial index tells us whether the face is broad, medium or narrow.

A classification is given below: A broad face is usually associated with broad cranium. Similarly, a narrow face is associated with a long narrow cranium.

When this condition is fulfilled a skull is termed harmonic. But this is not

always the case, as is seen among the Armenians, who possess long and relatively narrow faces, associated with short and relatively broad cranium.

A similar combination of face and cranium is found among the French Basques also. On the other hand, a long head and broad face occur in Cro-Magnon type and also among the Eskimos. This condition is described as disharmonic. Though the face is considered to be a racial criterion it cannot always be used extensively for purposes of racial discrimination, as the facial index is affected by some factors, such as sex, age, function, etc.

Females almost invariably possess shorter and comparatively broader faces than the males of the same ethnic group. Facial index shows considerable variation along with the changes of age. Again functional variation is also to some extent responsible for various types of face. Apart from these, hereditary nature of the different forms of face, e.

g., short, broad, long, narrow, etc. is also not perfectly known.

7. Jaw: Pragmatism is the protrusion of the jaw. When the face does not show any protrusion it is called orthognathism. Pragmatism is present in marked degree among the African and Australians.

They also usually exhibit projection of the alveolar margins of the upper and lower jaws which is termed alveolar pragmatism. The other type is called facial pragmatism. There may be little or no facial pragmatism among most of the Mongols and some white peoples, but they show slight or moderate of alveolar pragmatism. 8. Blood Groups: A new approach to classify human



racis is based on some normal physiological characters determined by certain easily defined genes whose generic behaviour is well known.

The classic example of such character is blood groups. This has been discussed in a separate chapter under ' Genetic Markers in Human Blood'. 9.

**Dermatoglyphics:** Dermatoglyphics (derma, skin + glyphic, carve) is the study of the ridge patterns of the skin of the fingers, palms, toes and soles.

The human body is covered with hairs and sebaceous (oil) glands except the palmer and planter regions which are continuously corrugated with narrow ridges.

The ridges make certain patterns. Dermatoglyphic patterns have long since been used for various purposes for their permanency and exchangeability throughout life. From the time of their formation in the fetus to the final disintegration of the skin after death the patterns remain unchanged. Of course, the ridges may be worn out and thus become invisible owing to various reasons.

Though ever since the beginning of the Christian era, finger patterns have been used for personal identification, yet systematic scientific studies started from the end of the nineteenth century. Uses of dermatoglyphic traits are manifold, but the anthropologists are more concerned in establishing variations in respect of traits among different human populations. However, the anthropologists are interested also in the study of dermatoglyphics in the context of twin diagnosis, paternity diagnosis, primatology, etc.

Dermatoglyphics fulfill many of the conditions laid down by Boyd for a good

racial criterion, Dermatoglyphic traits are not modified by environmental factors.

Dermatoglyphic traits are non-adaptive. These are not subjected to a high rate of mutation. Dermatoglyphic traits are identifiable without any subjective bias.

However, the genetic process of dermatoglyphic traits is complex and is not perfectly known. Ridges and patterns of the finger, palms, toes and soles are studied from different angles applying various methods. Here we shall deal with some aspects of finger patterns and the main line formula of palm only. Henry has classified the various finger patterns into four main types. These are: arches, loops, true whorls and composites. The composites form a heterogeneous assemblage of patterns. Again, three types have been identified by Galton. His three types are arches, loops, and whorls.

A loop may be open to the lunar side or to the lunar side or to the radial side and accordingly it is termed as ulnar or radial loop. The classic and widely used notation is A = arches; Lr = radial loops; Lu = ulnar loops; and W = whorls. The whorls possess two triadic, while only one tirade is present in loops. On the other hand tirades is absent in arches. Thus, generally speaking, the patterns may be identified from the occurrence of tirades. In general loops are more frequent than whorls. Arches are found in small numbers. Again, of the two types of loops, ulnar loop is much more frequent than radial loops.

Finger patterns exhibit racial variation as shown in the table below: It is evident from the table that whorls are most frequent among the Mongol

population and least among the Caucasian population. On the other hand loops appear most frequently among the Caucasian groups, while among the Mongol and African groups loops are found in equal frequencies. Again, arches appear in very small number in the Mongol. It is most frequent in the Negroid. The position of the Caucasian is intermediate.

Usually three indices are calculated on the basis of the frequency distribution of the different finger patterns. 10. Palm: Main Line Formula: At the bases of the digits II, III, IV and V four digital triadic are located. These are called a, b, c and d in radioulnar sequence. For the purpose of formation of palmer main lines, the palm is divided into 13 regions and each region is given a symbol or number. The proximal radiant of digital tirades is directed toward the interior of the palm. This radiant line is fully traced to find out in which region of the palm it ends, and accordingly the symbol of terminations determined. This line is called a palmer main line.

In this way four main lines can be obtained. These four main lines are named A, B, C and D. The symbols of the four termination regions of the four main lines give the main line formula. The formula is recorded in the order of D, C, B and A. The following three formulae are frequently observed in man; 1.

9. 7-, 9. 7. 5 and 7. 5. 5 It should be noted in this connection that the main line A is not usually considered in finding out population variations.

According to Wilder the 11, 9, 7, are the European formula and the 7.

5. 5, the African formula.