

ANTHROPOLOGIC AND ETHNIC CONSIDERATIONS

M. M. Altman, M.D.

The nose, as the most prominent feature of the human face, has been the subject of many anthropological studies. Nasal dimensions belong to the important and constant criteria of race, like colour of skin, stature form of skull and hair.

There is no fixed relationship between the shape of the skull and that of the nose. Dolicho, Meso and Brachycephaly, should not be related to Lepto, Meso and Platyrrhiny. Also narrow, long noses do not necessarily belong to a long skull, as is shown by the example of the North-American Indian with his long nose and broad skull. On the whole, height of the nose is correlated with the height of the face and better still with body-height. Also the width of the face measured between the zygomata corresponds well with the nasal width.

Prominence is the main difference between the shape of the bony nose of the primates and that of the humans. It depends mainly on the angulation of the frontal processes of the maxilla with its body and on the angle which is formed by the nasal bones against each other. This gives rise to the gable-shaped form of the human nose. The size of the **nasal bones** is also relatively much smaller in the human than in the other primates. Width, length and shape of the ossa nasalia show many variations in man. Those of the Esquimaux are long, narrow and sand-glass shaped. In the Mongoloids they are broad and short. The typical anthropine form seems to be slightly sand-glass shaped, the lower part broader than the part which connects with the frontal bone.

The depth of the naso frontal suture is very marked in the Australoids, whereas the nasal root is more prominent in the Mongoloids and this is independent of the development of the glabellar region. The prominent nasal root of the classical Greek statues, in which the dorsum continues without depression into the glabella was most likely only an esthetic ideal and not based on a racial characteristic of the ancient Greeks.

The **piriform aperture** is actually only piriform in the narrow nosed Caucasoids. Its width can be larger than its length in the extreme forms of Platyrrhiny of some Australoids. In the Negroid races width and length of the piriform fossa are more or less equal.

The lower border of the piriform fossa is dominated by the anterior nasal spine, which is a purely human characteristic. Its size is racially significant, and is dependent on the position of the alveolar process. It is longest with orthognathCaucasoids and shortest with Negroids. (5,5; 2,6 mm).

The shape of the lower border of the piriform fossa, the piriform crest, is of anthropological and surgical interest. In the process of transition from the animal snout into the human face, the angulation of the nasal floor against the alveolar process appears already in the Anthropoids, and it is caused by a regression of the alveolar process. In the orthognath Caucasoids there is a sharply raised crest which divides the facial part of the maxilla from the floor of the nasal fossa. In prognathic races this crest might be missing or only be poorly developed.

The lateral borders of the piriform aperture fan out in infants and form 2

ridges in the facial part of the alveolar process, forming in between them a shallow groove which was called praenasal fossa by Topinard. It can persist in adults and is usually connected with prognathism and a broad nose. A similar depression in this area is the *clivus naseo-alveolaris* (Sergi), characteristic for the anthropomorph apes, in which the floor of the nasal cavity passes without demarcation into the facial plane of the alveolar process. It is a frequent finding in Negroids and Polynesians. Martin and Saller found that the lower meatus is wider in Platyrrhines than in Leptorrhines and that the lower turbinates are relatively small in Platyrrhines. R. Williams found that the insertion of the inferior turbinates in Negroid skulls is 5—6 mm lower than in white skulls.

The **Anthropologic Nasal Index** is calculated from measurements of the skull by taking nasal height between nasion and subnasale and nasal width as the maximum width of the piriform aperture. Narrow-nosed, or Leptorrhines, have an index below 47, Mesorrhines between 47—51, and flatnosed or Platyrrhines above 51.

According to skull measurements, pure Leptorrhines are only some European groups (i.e. Scots), modern Egyptians and, surprisingly, Esquimaux. Most races all over the world are mesorrhine, although the Caucasoids have the lowest index. The Indices of the Mongoloid races and of the American Indians come close to 51. Negroids, Australoids are platyrrhine, especially so the South African Negroids, e.g. the Hotentots have an index of over 60.

The shape of the nose in the living is best expressed in the **cephalometric nasal index**. Width of the nose is measured as the lateral expansion of the nares and length from the nasale to the sub-nasale. Leptorrhines have a cephalometric nasal index from 55—70; Mesorrhines from 70—85, Platyrrhines from 85—100. Indices above 100 designate Hyperplatyrrhines. Roughly, as Topinard and Collignon already stated, the white races are leptorrhines, the yellow coloured races mesorrhines, and the dark races platyrrhines.

This nasal index is considered of great importance in racial diagnosis. This is strikingly indicated by Holland's observations of nasal indices in Indian groups living in the same region, but belonging to different castes and who did not intermarry. Platyrrhiny was marked in the lower castes and Leptorrhiny commoner in the higher castes.

The cephalometric nasal index cannot be correlated to the anthropological nasal index as the distance between the alae is much greater than the width of the piriform fossa. Cottle suggested the **clinical nasal index** in order to correlate the width of the piriform aperture through the skin to the length of the nose in the living. This seems valuable in the planning of reconstructive surgery of the nose. According to Williams, this clinical nasal index reached 61 in leptorrhines, 61—65 in mesorrhines, and 65—80 in platyrrhines.

The prominence of the nose is best seen in the **triangle of the base view**, which shows the relations of width and prominence of the tip. The prominence and shape of the tip depends on the development of the caudal end of the septal cartilage and the angulation between the medial and lateral crus of the lobular cartilages. The angle of the base triangle is acute in Leptorrhines and is usually below 70°. In Platyrrhines the angle is blunter, above 70°. The shape and the direction of the nares change with the various forms of the

base triangle. The oval nares of the leptorrhines are nearly sagittal. The nostrils of the platyrrhine are much rounder although still ovoid but their direction is nearly transverse. Height and width of the nasal base triangle are expressed in an index which can reach 100 in leptorrhines, in which case width and height are equal. It can be 20 in extreme forms of Platyrrhiny; however, on account of the small dimensions there are large variations even within separate ethnic groups.

Cottle suggested a "**Tip index**" for clinical purposes. It compares 2 measurements of width in the triangle. One is taken at the anterior extremity of the nostrils and the other is the maximum width of the alae. The average tip index in the Caucasoid Leptorrhine is between 60—70 and in the platyrrhine between 72—82.

The shape of the **nasal dorsum** depends largely on the length of the nose. A concave dorsum is found mostly in Platyrrhines and Mesorrhines; saddle nose as an ethnic characteristic was only found in the Senoi. The convex dorsum is nearly always met in Leptorrhines. Armenians and North-American Indians have the highest percentage of humped noses, whereas among 4000 New York Jews only about 15% showed convexity of the nasal dorsum. Tandler considered that the concave nose in Europeans is a formal infantilism and that the high convex dorsum is the most progressive form of the human nose.

Form and direction of the **nasal tip** are intimately connected with the shape of the dorsum. A rounded tip usually belongs to a concave dorsum of a meso- or platyrrhine and the sharp pointed or hanging tip to the convex or straight dorsum of the leptorrhine. The form of the tip is also influenced by the **alar cartilages**. In the nose of the Caucasoid, the inferior borders of the medial and lateral crurae run more or less parallel, with the lateral crus only being slightly higher. In Mongoloids and Negroids the lateral crus is more raised, and it is also smaller and thinner than in the Caucasoid nose. The rounded tip and raised lateral crus of the alar cartilages influence the plane of the nares. It has an upward direction in the nose of a meso- or platyrrhine, whereas in the average Caucasoid nose the nostrils point downwards. Also the **upper lateral cartilages** show racial variations. They are triangular shaped and smaller in the Negroid nose, but in the Caucasoid races they are quadrangular. The different shape of the lobule of the nose in platyrrhines is the result of the above mentioned variations of the cartilages forming it. The floor of the vestibule in Negroids is, in the same plane as the floor of the bony nasal cavity, with the piriform crest being hardly elevated in them. In Leptorrhines the level of the floor of the vestibule is 3—4 mm below that of the floor of the nasal chamber.

The ethnic characteristics of the nose are not yet apparent in children and the nose of the Caucasoid newborn is, with its concave dorsum, large alar width and upturned base triangle, much more platyrrhine than that of the adult. The greatest changes take place in the first 9 years, due to development of the jaws, but the full development of the nose is only concluded at about the 25th year in the Caucasoids.

Even in senility a change of the nose has been observed in the Caucasoids,