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The formation of nasal septum deviation in human evolution

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SUMMARY

The purpose of this research is to determine when in the process of human evolution nasal septal deviation first occurred.
There is a higher incidence of nasal septal deviations in man, while the septum of anthropoid ape is vertical and has not been found to have nasal septal deviations. It is said that our ancestors evolved respectively from ape like primates through Australapithecus, Pithecanthropus, Neanderthal man and finally Modern man. I concluded from my observations that the nasal septal deviations in man first occurred at the Neanderthal stage.

IT is thought that the Australopithecus, Ape man, evolved into the Pithecanthropus, Early man, then into the Neanderthal man, that is Old man, and finally into the Modern man. The present study was designed to determine at which stage in the course of human evolution that deviation of the nasal septum first appeared (Figure 1).
Fossil skulls of huminoids provide no information as to the status of the nasal septum; therefore, this study was carried out using the following methods:

1. A comparative anatomical study of the nasal septum.
2. A study of septal deformity in Modern man.
3. A study of the morphologic relationship between the brain skulls and the face skulls of the fossil huminoids.
4. Review of literature.

From the comparative anatomical point of view the nasal septum of man, dog and monkey were studied. The sphenoidal process appears in the dog skull and the monkey skull. There is a space for the adipose layer between the cartilaginous nasal septum and the vomer in the dog skull; however, it is absent from the monkey skull. There is a vomerine process in the skull of man. The junction between the cartilaginous nasal septum and the vomer is bent probably because

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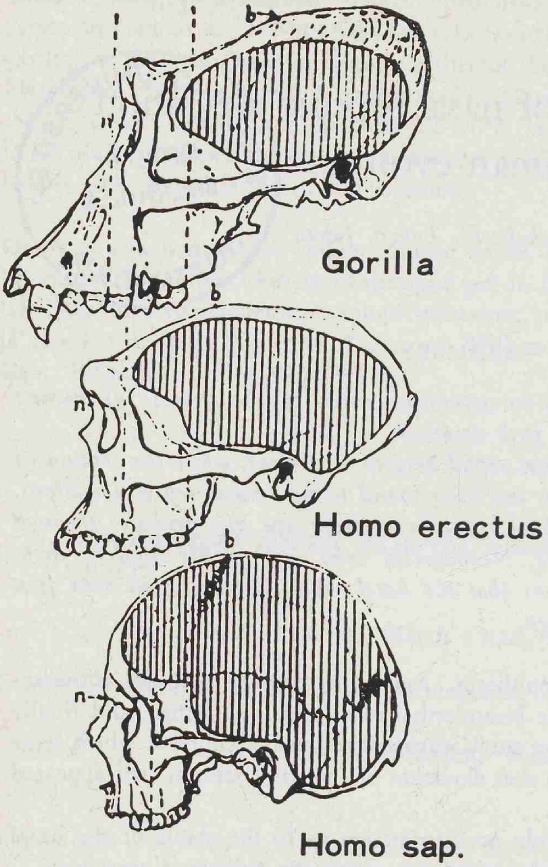

Figure 1.
(after Weidenreich)

there is lacunar absorption of the bone surface secondary to the compression with the cartilage.

Thus it seems that the vomerine process which is found only in man is in someway related to deviation of the nasal septum (Figure 2).

In order to understand why deviation of the nasal septum in modern man occurs studies included, among other things, the relation of the nasal septum to the angle of the skull base which is the border between the brain skull and the face skull. That is, the smaller the angle of the skull base (the sella turcica), the higher the external nose and the greater the deviation of the nasal septum (Figure 3). The greater the deviation of the nasal septum, the shorter the vomerine process (Figure 4).

According to these findings presented above, the skulls of the fossil huminoids will be discussed.

1. The brain volume increased chiefly in the antero-posterior direction in the

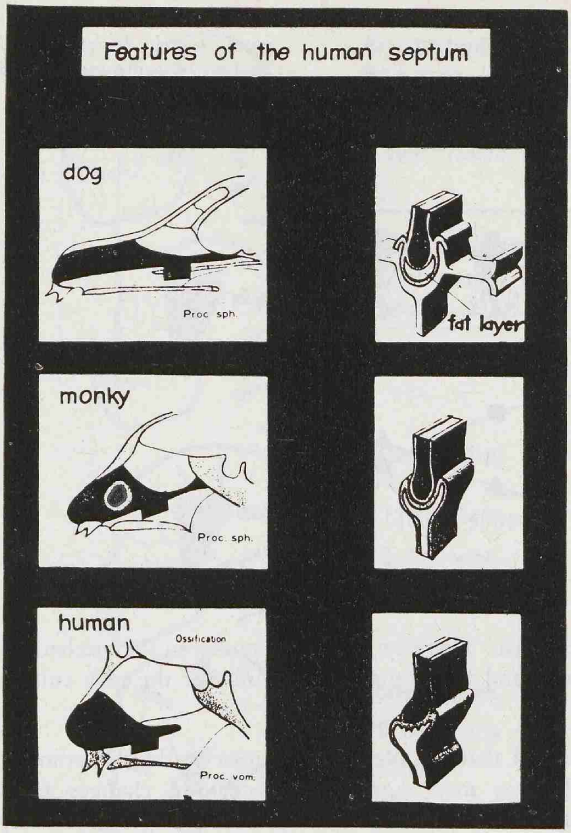

Figure 2.

change from the Australopithecus (Ape man) to the Neanderthal man (Old man). Accordingly, the brain volume increased by about three times during the period of about two and a half million years from the Australopithecus, to Neanderthal man. The brain skull enlarged, while retaining the same mechanical properties.

2. The brain volume of the Neanderthal man, was as large or even larger than that of the Modern man, but the maxillo-facial skull of the former was more primitive, resembling that of the Pithecanthropus. In other words, it is accepted that the brain volume of the Neanderthal man was in the range of 1350 to 1400 ml; however, the face skull lacked the forehead, and presented marked prognathion, which was imbalanced when compared with the brain volume (Figure 5).

3. The most remarkable changes occurred in the transition from the Neanderthal man to Modern man. This was the brachycephalization, namely spheration of the brain skull, associated with the formation of the forehead, the disappearance of the brow ridge and the reduction of the maxilla and mandible. Thus, the skull was markedly transformed with the transition from the

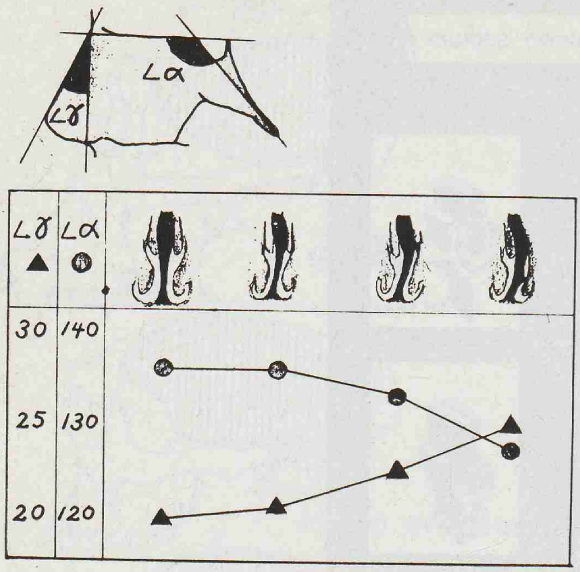

Figure 3. Relation between nasal septal deviation and angles in anterior cranial base.

Neanderthal man to Modern man. This new shape responded to the mechanical balance of the brain volume, and this transformed skull met the new culture (Figure 6).

4. It may therefore be considered that the Neanderthal man marks the point at which the skull has undergone most significant mechanical changes from the previous stages in evolution. It is not accurate all these changes necessarily have been mechanically balanced. This is because the brain skull is seated on the face skull as if to hold the face from the upper and posterior direction.

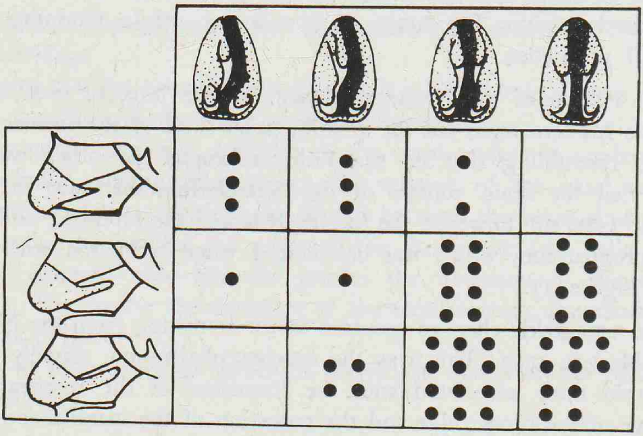

Figure 4. Relation between nasal septal deviation and length of proc. vomeris.

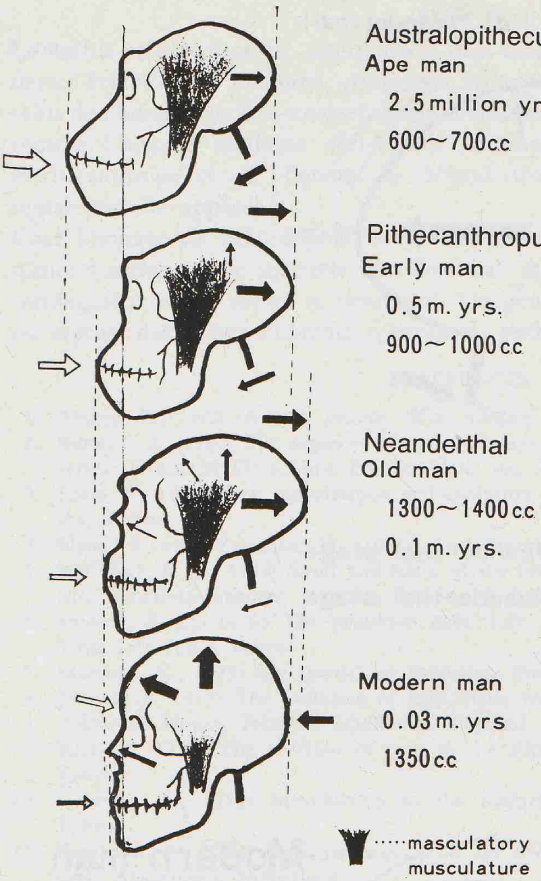

Figure 5.

This tension or a strain due to stress on the face skull by the enlarged and expanded brain skull has contributed to the elevation of external nose and deviation of the nasal septum (Figure 7).

Thus, I have suggested that the brain skull began to exert an active influence on the maxillo-facial skull.

From the results of these studies, I infer that deviation of the nasal septum of man was first formed in the Neanderthal stage of human evolution.

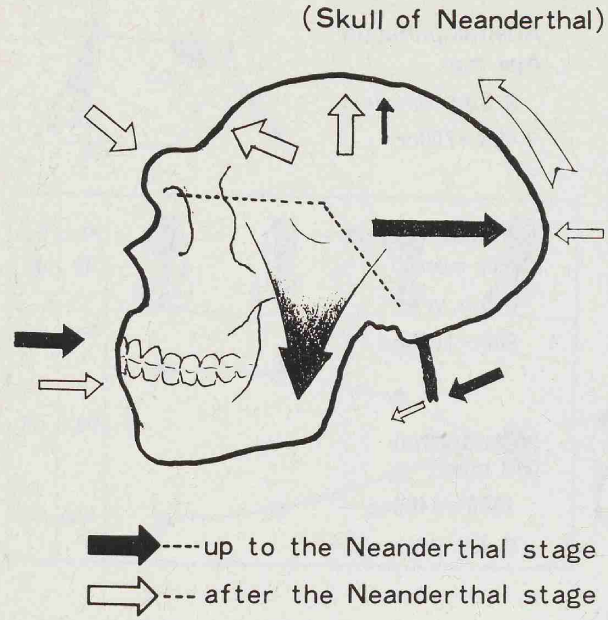

Figure 6.

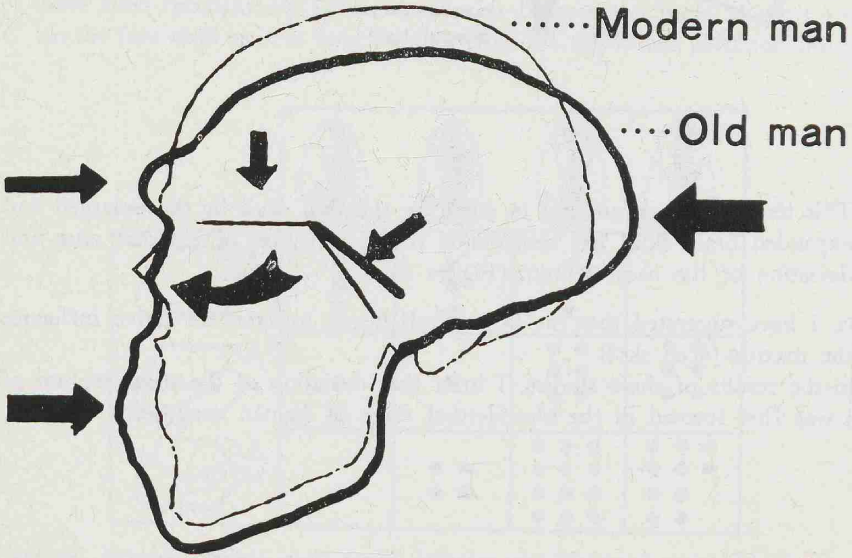

Figure 7.

RÉSUMÉ

Le but de ce travail est de déterminer à quel moment apparait la déviation septale dans l'évolution de l'homme. Alors que le septum des anthropoïdes est vertical, celui de l'homme est très souvent dévié. L'ancêtre de l'homme dérive des Primates, comme l'homme moderne dérive des anthropoïdes, à travers l'évolution du Pitchécanthrope et de l'homme de Néanderthal. A quelle étape la déviation septale est-elle apparue?

Chez l'homme de Néanderthal, le développement du cerveau et du crâne commence à influencer le squelette maxillo-facial. A ce stade, les rapports du septum cartilagineux et du vomer se modifient. On peut donc conclure que la déviation du septum nasal chez l'homme apparait au stade de Néanderthal.

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