ANTHROPOLOGICAL BULLETINS

from the

ZOOLOGICAL SURVEY OF INDIA

Bulletin No. I

JULY, 1931

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By

B. S. GUHA, *A.M., Ph.D.,*

Anthropologist, Zoological Survey of India

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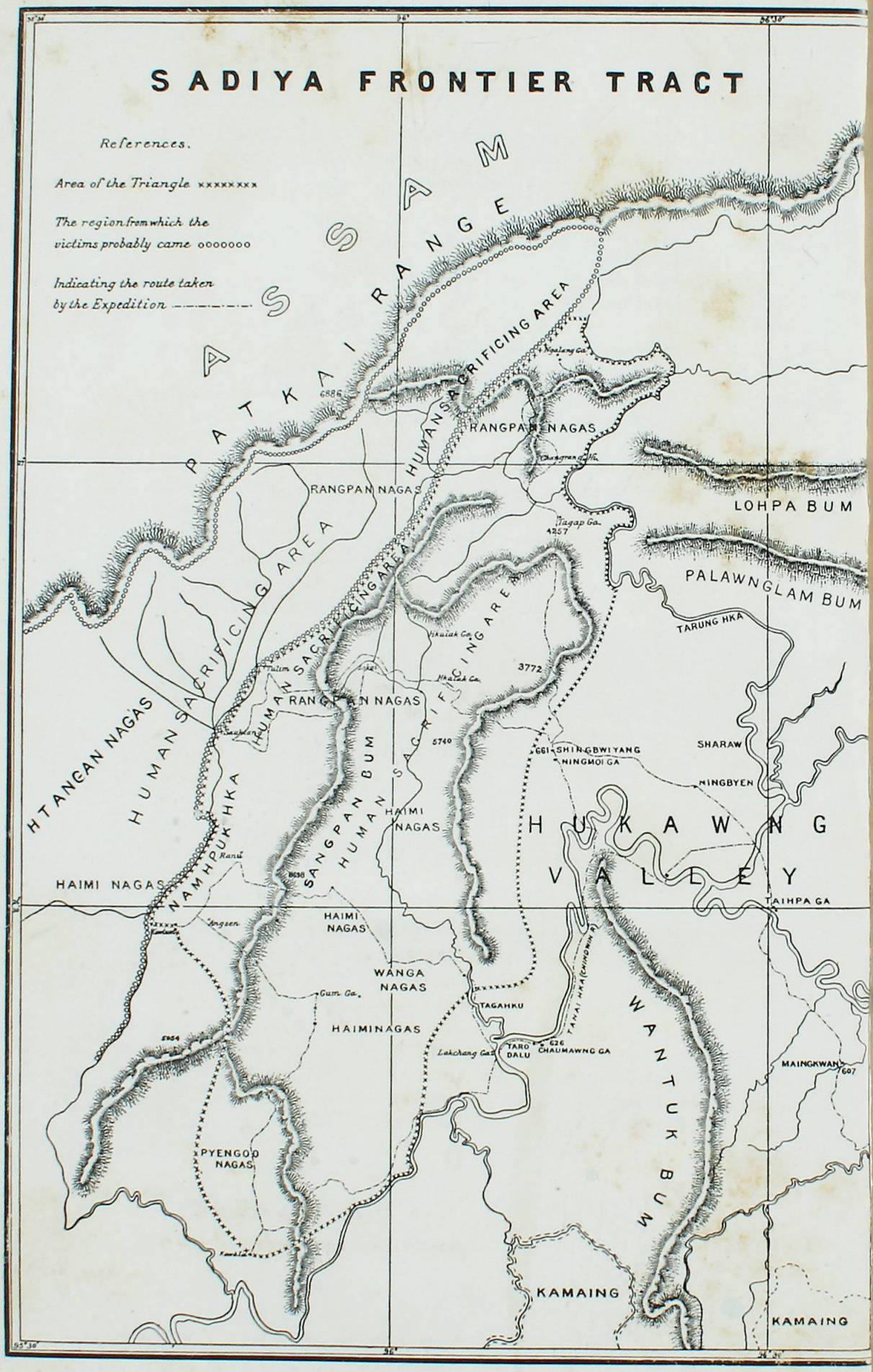

Map showing the region from where the Skulls were obtained.

A REPORT ON THE HUMAN RELICS OBTAINED BY THE NAGA HILLS (BURMA) EXPEDITION FOR THE ABOLITION OF HUMAN SACRIFICE DURING 1926-27.

Introductory Note.

By Resolution No. 19 of the Government of India, Department of Education, dated the 20th June, 1916, the Zoological Survey of India was created out of the Zoological and Anthropological Section of the Indian Museum and the Director, the late Dr. N. Annandale, was placed in charge of the Zoological and Anthropological collections. At that time there was no Anthropologist on the staff of the Zoological Survey, but fortunately Dr. Annandale was himself keenly interested in the subject and had had some anthropological experience both in the Faroe Islands and the Malay Peninsula. During the years 1916-1919 Dr. Annandale took a number of measurements and observations on the Anglo-Indians of Calcutta and the results were entrusted to Prof. P. C. Mahalanobis for statistical examination. As at that time there was but little likelihood of any great increase in the anthropological activities of the Zoological Survey this report was incorporated in the "Records of the Indian Museum," a special volume (No. XXIII) being devoted to it.

In 1926, after assuming charge of the Zoological Survey of India, I felt that it was essential for their proper care that the anthropological collections should be under the charge of a whole-time officer and I appealed to the Government of India to appoint an Anthropologist. This appeal was strongly supported by the Trustees of the Indian Museum and in 1927 Dr. B. S. Guha was appointed Anthropolgoist to the Zoological Survey of India, at first for a period of two years, and in 1929 he was confirmed in his appointment. As a result a considerable amount of anthropological research work has been and is being carried out and it is hoped that from time to time reports dealing with these collections of the Indian Museum or with research on the population both past and present of this country will be submitted for publication.

It was felt that if such reports were included in the "Records" and "Memoirs of the Indian Museum," which have heretofore, with the single exception noted above, been devoted solely to Zoology, the general character of these publications would be radically changed, and rather than do this I have obtained the permission of the Government of India to inaugurate a third serial under the title "Anthropological Bulletins from the Zoological Survey of India," of which the present number is the first. Other parts will be issued from time to time as material becomes available.

R. B. Seymour Sewell,
Director, Zoological Survey of India.

The crania which form the subject of this study were surrendered to Mr. T. P. Dewar of the Burma Frontier Service, who led an expedition into the Naga Hills (Burma) in 1926-27. The expedition was sent by the Burma Government to continue the work begun by Mr. J. T. O. Barnard in 1925-26 for the abolition of slavery in the Hukawng Valley and for the suppression of human sacrifice among the Naga Tribes living in the unadministered areas of Burma.

The expedition [1] left Kamaing (lat. 25° 30′—long. 96° 39′) on December 28 (1926) and reached Mainkwang (lat. 26°19′—long. 96° 36′) in the Hukawng Valley on the 4th of January 1927, where it established its main base. From the 7th of January, when it left Mainkwang, to the 12th of April, when it returned, the expedition penetrated into the Naga Hills Tracts thrice and covered the territory bounded by the Namphuk Hka (the Dilli River) on the west, the Namphuk Hka and the Tanai Hka (the Chindwin River) on the south, the Tanai Hka and longitude 96° 15′ on the east, and latitude 27° 1′ on the north. (*Vide* Map.)

This area, as defined above, consists in the main of the valleys of the Namphuk on the west and Tanai and Torung on the east, separated by the high mountainous range of the Sangpan Bum. The northern, southern and eastern portions of the territory are covered with dense tropical forests but the Namphuk Valley and the western hills up to a height of about 6,000 ft. have been cleared of all trees by the Nagas for Taungya [2] (hill clearing) cultivation. The villages are built on hill tops, some of them at an altitude of 6,400 ft. and are mostly stockaded, specially in the Namphuk Valley where the population is also much more dense. The climate, except in the low-lying valleys, is temperate and there is heavy rainfall during the south-west monsoon.

Human sacrifice [3] is practised within the Triangle, the name given to the region lying roughly north of lat. 26° 31′ and stretching as far as the Patkoi mountains in the north and west. The villages, numbering over 70, within this area are under the influence of two Kachin families, namely the Ningmoi and the Shingbwiyang, who exercise a sort of loose control but are not powerful enough to prevent the Nagas from sacrificing human beings, although themselves looking upon the practice with abhorrence.

The skulls and bones of these sacrificial victims, brought back by Mr. Dewar, came from 41 villages within the Triangle, a full list of which is given in Appendix B of his Report.[4] These remains were accepted as proofs of good faith on the part of the Nagas, and of their intention to keep their promise regarding the discontinuance of human sacrifice, hitherto prevalent among them. Very little information, however, was available as to the origin, *i.e.*, tribe and locality, of these victims. As these unfortunate individuals passed through many hands and villages before finally reaching their destinations, the exact location of their original homes was almost impossible to determine. From the

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[1] Confidential Report on the Naga Hills (Burma) Expedition for the abolition of Human Sacrifice. Season 1926-27 by T. P. Dewar. Rangoon. 1927.

[2] Burma Gazetteer, Myitkyina District, Vol. V, p. 89, 1912, Rangoon.

[3] Mr. Dewar has given in his Report an excellent account of human sacrifice among the Nagas, from which these details are taken.

[4] *loc cit.* p. 50.

enquiries made by Mr. Dewar it became evident that they did not belong to the tribes living within the human sacrificing area but were either captured during raids or were procured from the south-west and west of that area by middle-men who were engaged in this traffic. This part of the trans-Namphuk country being unexplored, very little is known of the tribes living there, beyond the fact that they are inveterate head-hunters and are called Hkang Katsing or wild Nagas by the Naga tribes of the Triangle. The chief of Ngalang Ga[1], one of the most prominent and intelligent chiefs of the human sacrificing area, however, informed Mr. Dewar that the victims obtained by them for sacrifice come from the following tribes living across the Namphuk Hka : Singpa, Wakka, Himhku, Nukpa, Yaugngaw and Kyetsan.

While, therefore, it would not be unreasonable to assume that the skeletal relics of the victims of human sacrifice recovered by Mr. Dewar belong in the main to the head-hunting Naga tribes living in the south-west and west of the Triangle across the Namphuk Hka, the possibility of the inclusion of some captives from outside that area and the remains of a few stray foreigners who found their way into the country and were secured by middle-men for sacrifice, cannot altogether be ignored. In this connection there is evidence that leads one to suspect that in one case at least an Assamese was sacrified (Government of Burma letter No. 272, Q27, dated the 5th January 1928, to the Director of the Zoological Survey of India).

The bones were despatched from Burma in three instalments and were received in this Museum on November 25, 1927, March 20, and July 9, 1928. They were packed in wooden cases with rice husks and straw and in the majority of cases they were uninjured. In a few, however, slight damage was done in transit. Generally the bones were covered with earth and wasps' nests had been built inside the nasal fossae, orbital cavities and maxillary air sinuses. Some displayed signs of having been smoked, in conformity with the custom prevalent among certain Naga clans, *e.g.*, Longkhai, Gasham and Hkalak, before the bones were suspended in the front porch of their houses.[2] In most cases the bones when received had dried skin and flesh attached to them, showing, apparently, that the Nagas consider it unnecessary to thoroughly clean them and do not regard as objectionable the odour of the putrified organic matter associated with them when they are hung up in their houses.

In each of the bones there has been drilled one or more holes and through these has been passed a palm-fibre string, by means of which it was suspended. These apertures are circular in shape with an average diameter of 11 mm. The exact position of the aperture, however, is not fixed but varies in different bones. Usually there is only one aperture but in the following bones there are two : (i) Frontal—N 21, 35, 44, 46, 104, 111, 115, 122, 194 and (ii) occipital—N 168.

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[1] *loc. cit.* p. 22.

[2] *loc. cit.* p. 24.

The Naga skulls examined by Turner were also smoked.

Turner, Sir William—Contributions to the craniology of the People of the Empire of India, Part I. *Trans. Roy. Soc., Edin.*, Vol. XXXIX, p. 719.

As a general rule each bone was kept separate but some, specially the smaller ones, were bound together in lots. In one case a piece of skull (*vide* Fig. 1, Plate I) and a portion of a radius were covered with leaves and bound up with strips of cane and the whole was tied to a bamboo shaft, at the two ends of which strings were attached for suspension. In another (*vide* Fig. 2, Plate I) the frontal and occipital parts of skulls were placed one over the other and tied to a radius at the neck, and in a third (*vide* Fig. 3, Plate I) two frontal and occipital parts of skulls were tied with as many as four radii and a fibula, three of the former being bound together in one lot. The exact manner in which they were tied up for suspension is shown in the photograph.

Before any systematic examination could be commenced the strings had to be cut, the bones thoroughly cleaned and all earth and extraneous matter removed. In many cases they had to be soaked in alcohol before the dried-up skin and flesh could be scraped off without injuring the delicate parts of the bones.

Including small fragments the total number of bones was 217, of which 21 were whole or portions of arm and leg bones, 31 small pieces and 117 and 43 frontal and occipital parts respectively of skulls. Only five of the skulls had the cranial vaults complete, though even in these the infra-occipital region and the greater part of the basis cranii have been removed. In the Naga skulls examined by him, Turner finds the same condition and suggests the extraction of the brain as the probable reason.[1] In no case was the mandible present with any cranium.

Mention should be made in this connection of the Naga custom[2] of dividing the skull, after the sacrifice of the victim, into two or more parts of which the front is retained by the owner and the back taken by the executioner. Those who assist in the purchase of the victim get bits of skulls or arm or leg bones.[3] It is apparenly only in those rare cases, where the owner receives no assistance from others in the sacrifice, that the skull is retained by him intact.

A Dāc [4] or large heavy knife is used for cutting up the skulls. Judging from the lack of uniformity of the cuts and the diversity of the sizes and shapes of the chopped-off portion there is obviously no recognised canon among the Nagas as to the precise manner in which the skull has to be divided. Possibly this depends on the effects of the blows of the Dāo or the inclination of the person at the time of performing the operation. Usually the skull is cut vertically behind the coronal suture—the distance from the coronal suture to the cut varying in different bones from 6 mm. to 53 mm. In a few, however, the vertical cut lies somewhat in front of the coronal suture. The division of the skull is on the whole fairly neatly done showing that the Dāo used is sharp and that the Nagas have acquired a certain amount of dexterity in the art. Evidence of clumsiness, however, is not wanting and in some instances there are signs of successive chops and irregular fractures, *e.g.*, Nos. 13, 172 194, 219, etc.

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[1] *loc. cit.* p. 719.
[2] Dewar, *loc. cit.* pp. 24-26.
[3] In some clans leg bones are not taken (*loc. cit.* p. 25).
[4] *loc. cit.* pp. 23-24.

A full list of the smaller bones is given in Appendix A and below are mentioned the details regarding the larger pieces of skulls :

A. *Skulls with complete cranial vaults.*

N 170.—(*Vide* Plate II, Figs. 1, 2, and Plates VII, XVI.) The facial portion from the upper part of the nose as well as the entire basis cranii, including the palate, has been chopped off by numerous vertical and horizontal cuts. Viewed from above (Norma Verticalis) the skull presents a rounded shape ; the occiput, however, is not flattened, but bulges moderately, showing that the skull has none of the characters of true brachycephaly, though giving a high mesocranial index (79·89). The greatest breadth is in the region of the parietal eminences. Seen from the front (Norma Facialis), the glabella is not marked and the superciliary parts of the supraorbital ridges are not differentiated. The nasion is flat and broad but not depressed. The frontal eminences are pronounced. When seen in profile (Norma Lateralis), the forehead appears to rise vertically and then slopes upwards and backwards to the vertex, which is about 18 mm. behind the bregma. From this point it curves downwards to the inion. The zygomatic arches are thin and the muscular attachments not well marked. The circular hole drilled in the skull for the passage of the string is 8 mm. behind the bregma. There is no sign of the commencement of closure of any of the sutures. Judged by its size and weight, the skull appears to have been that of a woman in the prime of life.

N 174.—(*Vide* Plate II, Figs. 3-5, and Plates VIII, XII, XVII.) The basal portion of the skull, from below the external occipital protuberance to the back of the palate including the petro-mastoid regions and the lower parts of the meatal cavities, has been chopped off by several cuts. When viewed from above, the skull presents an ovoid shape but is actually much longer than its appearance suggests ; the Length-Breadth Index being 70·22. This is due to the bulging of the supraoccipital region in a very marked degree. The glabella is moderately marked and the superciliary parts are distinguished from the supraorbital ridges. The nasion is not depressed but is rather flat, though the nasal aperture is long and narrow (Nasal Index 46·15) and the lower margins are not demarcated. There is a deep fossa on each side immediately below the infra-orbital foramen. When viewed from the side a distinct alveolar prognathism is noticeable. Muscular attachments are well marked and the skull is thick and heavy. The greatest breadth is bi-parietal. There is no sign of the beginning of synostosis in any suture and the skull appears to have belonged to an adult female in the prime of life.

N 175.—(*Vide* Plate III, Figs. 1-3, and Plates IX, XIII, XVIII.) The basal portion of the skull from the inion to the basilar process of the occipital bone has been chopped off. The skull when viewed from above has an ovoid shape. The Length-Breadth Index (74·21) shows that it falls within the dolicho-cranial class. The maximal breadth is bi-parietal, When viewed from in front, traces of a metopic suture are noticeable extending from the nasion to the glabella, which is well marked, and there is a clear distinction between the superciliary ridges and supra-

orbital parts of the forehead. The nasion is not depressed but the nasal bridge is flat and broad. The lateral margins of the pyriform aperture have been pruned off above, but below they are gutter-like and continuous with the incisive fossae. A distinct alveolar prognathism is noticed when the skull is viewed from the side. The zygomatic arches are prominent. The highest point in the vault coincides with the bregma. The occiput is not markedly bulging and is somewhat depressed in the region of the lambda. There are two holes in the skull ; one, which has been carefully drilled, just in front of the bregma, and the other, clumsily cut through the bone, about 27 mm. in front of the first. The basi-occipital has fused with the basi-sphenoid. All the teeth are erupted and there is no sign of the commencement of closure in any of the ecto-cranial sutures. The skull is that of an adult in the prime of life and probably belonged to a male.

N 176.—(*Vide* Plate III, Figs. 4-6, and Plates X, XIV, XIX.) The cerebellar part of the occipital bone, from the inferior nuchal lines up to the basilar process and including the petrous portion of the right mastoid, has been chopped off. When seen from above the skull presents an ellipsoid shape. The Length-Breadth Index is 78·36 ; and judging from the outward projection of the occiput it does not show any characteristic of brachycephaly though the maximal breadth is bi-squamosal and not bi-parietal. The glabella is hardly perceptible and the superciliary and supraorbital ridges are not distinguished. The frontal eminences are moderately developed and the forehead inclines to be vertical. The root of the nose is flat and broad and the lower margins of the pyriform aperture are not sharp but continuous with the incisive fossae. The hole for the passage of the string is situated 7 mm. in front of the bregma. The right mastoid (the left is missing) is small and the palate very broad (Index 91·89). The third molars have not erupted. All the sutures are open. The muscular attachments are not marked. The skull appears to be that of a young female.

N 177.—(*Vide* Plate IV, Figs. 1-3, and Plates XI, XV, XX.) The entire basis cranii up to the back of the palate, including the lower portions of the mastoid processes and meatal cavities, has been chopped off. The lateral margins of the right orbit and zygomatic arch are missing. Viewed from the front the glabella appears to be very slightly developed and the superciliary parts of the supraorbital ridges are not demarcated. The frontal eminences are not marked and the root of the nose is flat and depressed. The lateral margins of the pyriform aperture have been pruned off with a sharp instrument. The lower margins of the same are not sharp but continuous with the incisive fossae. The two incisors on the right are missing—the roots of the canine on the right and of the left incisors, however, persist in their sockets. In profile a distinct subnasal prognathism is noticeable. The highest point of the vault lies just 25 mm. behind the bregma. The occiput is not flattened but bulges out. The maximal breadth is in the region of the parietal eminences. The skull is long—the Length-Breadth Index being 71·35. There is a circular hole drilled in the frontal bone 35 mm. in front of the bregma. The zygomatic arch on the left side is moderately prominent and the muscular attachments are well marked.

The teeth, all of which have been erupted, do not show much attrition. There is no sign of the commencement of closure in any of the sutures. The skull appears to be that of a male in the prime of life.

Apart from the five skulls described above, the other bones consist of frontal and occipital parts of skulls only, as already mentioned. In most cases they have been divided roughly through the centre of the cranial vault, but some contain only the anterior portion of the forehead and face and in a few about two-thirds of the vault is present, but none of them is large enough to give an idea of the form and proportions of the entire cranium. Detailed descriptions of these bones, therefore, have been thought unnecessary. Particulars regarding the nature of their cuts, however, are of some interest and are as follows :—

B. *Frontal Portions.*

(*a*) Bones divided vertically from 6 mm to 53 mm. behind the coronal suture.

N 2, 3, 6, 9, 45, 46, 56, 57, 59, 61, 62, 67, 104, 106, 107, 109, 110, 111, 112, 114, 115, 116, 117, 118, 119, 123, 124, 125, 163, 170, 178, 180, 181, 183, 188, 190, 193, 195.

Bones divided vertically with the lateral margins of the pyriform aperture pruned off by additonal cuts :

N 1, 14, 53, 113, 189.

Bones divided vertically with the lateral margins of the pyriform aperature pruned off and the right zygomatic bone removed :

N 11, 31, 54, 64, 103, 169, 185, 189.

Bone divided vertically with the lateral margins of the pyriform aperture pruned off and the zygoma and the maxilla of both sides removed :

N 42.

Bones vertically cut with the lateral margins of the pyriform aperture pruned off and the basal part removed by additiona cuts :

N 122, 166, 170, 174, 175, 176, 177.

Bones vertically cut with the right zygoma and maxilla removed :

N 10, 18, 19, 20, 21, 24, 43, 44, 47, 51, 58, 60, 63, 101, 105, 108, 121, 164, 171, 182, 186, 189, 191.

(*b*) Bones diagonally cut from the centre of the cranium to the posterior end of the Foramen Magnum :

N 15, 22, 30, 33, 35, 48, 49, 50, 52, 53, 55.

Bone diagonally cut with a back to front inclination from a point 11 mm. behind the parietal foramina to the centre of the Foramen Magnum by successive chops:

N 172.

Bone diagonally cut from the front of the coronal suture to the inion below with the right zygoma, maxilla and the occipital condyles removed by additional cuts :

N 173.

Bones diagonally cut from a point 23 to 31 mm. below the lambda to the back of the palate with the basis cranii and the infra-occipital region removed :

N 166, 209, 215.

Bone diagonally cut from a point 14 mm. behind the parietal foramina to the centre of the Foramen Magnum in a back to front inclination :

N 179.

Bones diagonally cut from a point between 9 to 10 mm. behind the parietal foramen to the back of the palate with the occipital and basal parts removed by successive chops :

N 12, 13, 122, 219.

(*c*) Vault removed by successive chops leaving only the facial and palatal parts :

N 194.

C. *Occipital Portions.*

Vertically cut from behind the coronal suture to the inferior nuchal lines below :

N 17, 23, 26, 28, 29, 32, 35.

With additional horizontal cuts removing the entire portion from the inion to the basilar process.

N 4, 8, 73, 79, 83, 86-93, 95, 97, 100, 134, 184, 187.

With additional secondary cuts : 1 on the right, 1 on the left and 2 or 3 at the base removing the mastoid and the petrous portion of the temporal bones :

N 94, 96.

From the foregoing accounts it is obvious that the bones are very incomplete and fragmentary and only a few measurements could be taken of them. Attempts to fit the occipital to the frontal portions were not successful, as they all belonged apparenly to different skulls. All measurements and observations had, therefore, to be confined to the two parts separately with the result that, excepting the five complete skulls described above, a general view of the entire cranium was not possible other than in an indirect manner. Fortunately, in a few cases this has been rendered possible by some of the occipital parts which are of sufficient size to disclose the shape of the back of the skulls, thus giving important clues as regards the form of the whole skull. It is also a matter of some satisfaction that in the majority of cases the front parts retain the facial portions intact and as Sir Arthur Keith[1] has pointed out, in the identification of races the latter furnish the most reliable guide. Consequently, conclusions and deductions arrived at in this paper, though in the main based on parts of skulls only, are not without significance in unravelling the racial types of the Nagas of the trans-Namphuk region—a country totally unexplored and about whose inhabitants hardly any information has hitherto been available.

Of the total number of bones it was possible to determine sex and age, with any degree of certainty, in only five complete skulls and 117 frontal

[1] Sir Arthur Keith, Report on the Human Remains. Ur Excavations, Vol. I. Al-Ubaid, p. 215, 1927. Oxford.

parts. The occipital portions, though in some cases they suggest sex and age from their general development, weight and thickness, have been omitted from consideration, their determination being of too uncertain a character. Of the former, 61 were adult males, 24 adult females and 31 children. This division incidentally shows that among the Nagas of the Triangle, victims are procured for sacrifice without any marked consideration of sex and age,[1] and the comparatively scarce representation of women and children in the collection is in all probability not due to chivalry but to the greater difficulty of capturing them, as they seldom venture very far from the village precincts.[2]

Anomalies.

The metopic suture is present in 15 specimens in varying proportions. In one—N 19 (Fig. 4, Plate IV) it is complete and extends from the nasion to the bregma.

Wormian bones are present in numerous cases. The region where these bones most frequently occur is in the Pars Pterica where small bones were found in 9 skulls. Along the lambdoid suture also large ones were found. Thus in N 4 (Fig. 5, Plate IV, and Plate XXI) there is a large wormian bone at the lambda, 56 mm. × 38 mm., and a small one on its right, measuring 20 mm. × 12 mm. N 196 (Fig. 6, Photo Plate IV) shows two large bones, one at each asterion ; the left one measuring 54 mm. × 28 mm. and the right one measuring 60 mm. × 33 mm. And finally in N 95 (Fig. 7, Plate IV, and Plate XXII) there is a wormian bone, 56 mm. × 48 mm. at the lambda and two other large ones on its left and right, measuring 62 mm. × 43 mm. and 60 mm. × 47 mm. respectively, besides 10 other small bones along the entire lambdoid suture.

In three specimens (N 45, N 46, N 49) the spina angularis is well marked.

In N 169 and N 183 the premaxilla has not fused with the maxilla. In N 181 the temporal is united with the frontal at Pars Pterica and in N 183 the basi-occipital and the spheno-ethmoidal planes are at right angles to one another. The existence of palatal bridges over the palatine grooves is found in N 182 and N 189 on the left side on the inner aspect and in N 43 on the left side on the outer aspect. In N 164, N 179, N 182, N 186, N 191 and N 212 there is a palatine torus on both sides of the median suture in the posterior and in N 215 in the anterior parts. Finally, in N 217 there is a tympanic perforation on the left side.

Measurements.

In taking measurements the procedure adopted in the International Agreement of 1906 was followed except in the following, where slight modifications, recognised in subsequent practice, were adopted :—

(i) The Auricular height [3]—the highest point in the vault along a plane at right angles to the Frankfurt Horizontal was taken as the upper terminus, instead of the bregma.

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[1] Dewar, *loc. cit.* p. 26.
[2] Turner, Sir William, *loc. cit.* p. 717.
[3] Rudolf Martin, Lehrbuch der Anthropologie, Bd. II, p. 634, Jena, 1928.

(ii) Interorbital diameter [1]—the width between the two maxillo-frontalia was used instead of the two lacrimalia.

Measurements taken but not included in the International Agreement are as follows :—

(i) Bi-orbital breadth—inner and outer—measured between the inner and outer ends of the fronto-malar junctions.[2]

(ii) Biasterionic diameter—taken between the posterior ends of the masto-parietal sutures.[3]

(iii) Naso-malar curve.[4]

(iv) Frontal and Parietal arcs and curves.[4]

(v) Measurements taken on craniograms.[4]

Besides the above, measurements were taken to show the position of the external auditory meatus and certain projections of the face for which full references have been given in the body of the text.

It should be noted in this connection that as some of the anatomical landmarks are really 'areas' and not 'points', to use Miss Tildesley's [5] language, slight differences are bound to occur in measurements taken not only by different persons but by the same person at different times even though an uniform technique may have been followed throughout. In order to guard as far as possible against this and ensure strict comparability of data, the landmarks were first carefully ascertained and marked with pencil before the distances were actually measured.

A complete list of all the measurements with their indices and statistical constants will be found in Tables I-VIII; in Table IX are given additional measurements, angles, etc., taken on the crarniograms. In Table X are given the cranial capacities of 42 skulls calculated from average measurements of the Transverse Sulci.

General characters of the skulls.

Shape of the head.

In considering the question of the general shape of the head of the people represented in these skulls, we are unfortunately handicapped for want of data of a sufficiently large number. As noted already, in only 2 ♂ and 3 ♀ skulls are the cranial vaults present intact. The average maximum length in the male skulls is 184±0·96 and in the female 176±2·01 and the maximum breadth is 135·6±1·03 and 133·8±1·35—the average percentage of proportions between the two being 72·8±0·67 and 76·1±1·74 respectively. The auricular height is 122·9±0·57 in the case of the male skulls and 119·1±1·35 in the female and the Breadth-Auricular Height Index in the two series are 92·7±0·71 and 90·4±0·43 respectively. These figures tend to confirm the view given by the tracings of the skulls in profile (Plates VII-XI) which disclose a 'cap'-like

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[1] *loc. cit.* p. 658.
[2] Sir Arthur Keith, *loc. cit.* p. 223.
[3] *loc. cit.* p. 229.
[4] Rudolf Martin, *loc. cit.* pp. 625-678.
[5] M. L. Tildesley, A First Study of the Burmese skull. *Biometrika*, Vol. XIII, p. 181 (1920).

occiput and show no signs of flattening. The maximal occipital diameters taken between the anterior and posterior ends of the masto-parietal sutures are 124 mm. and 109 mm. in the complete male and 123 mm. and 108·6 mm. in the female skulls, showing a gradual narrowing-down of the sides of the lower part of the back of the skull from the parietal region, where the breadth of the cranium reaches its maximum. In the broken occipital pieces this dome shape is also distinctly noticeable.

In 26 of these bones it was possible to measure the post-biasterionic diameter, the mean of which is $108 \pm 1{\cdot}05$ only. Taking the two series of bones, therefore, there can be no doubt that the skulls present essentially dolichocephalic characters with high cranial vaults, without exhibiting any tendency towards scaphocephaly. The data regarding the depth of the subauricular part of the skull are not conclusive. In none of the five complete skulls could the basi-bregmatic height be measured but in 2 ♀ and 3 ♂ frontal parts the depth of the cranial base is 12·2 mm. and 5 mm. respectively only. A great depth of the subauricular region has been suggested as a mark of strength and primitiveness [1] and one would naturally look for the same in the Nagas, but possibly the male figures represent exceptional individuals only and cannot be regarded as an index of the character of the entire tribe.

Cranial Capacity.

The determination of the cranial capacity of the skulls in the present collection was somewhat of a difficult task. In all cases where direct measurement is not possible, very correct estimation of the cranial capacity can be obtained from the maximum length, breadth and the auricular height of skulls in accordance with the formulae devised by Alice Lee and Karl Pearson.[2] In the present occasion, however, as these measurements could be taken in 5 skulls, the Lee-Pearson formulae Nos. 10 and 11 could be applied to them only. Fortunately, Prof. T. Wingate Todd [3] has suggested another set of formulae for determining the cubic capacity of skulls from single measurements. Applying his formula No. 3 for the auricular height, the cranial capacity could be estimated in 20 cases in which this measurement has been possible. Similarly in a recent communication Prof. Drennan [4] has shown that a high degree of correlation exists between the width of the transverse sulci on the inner surface of the occipital bone and the cranial capacity, and he has devised a regression formula by the aid of which the cubic capacity of a skull could be determined from the average width of the sulci with a probable error of only $\pm 0{\cdot}69$. In 42 occipital pieces in the present collection the endocranial aspect of these parts was examined, the average width of the transverse sulci taken and cranial capacity calculated according to the formula devised by Prof. Drennan (Table X).

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[1] Keith, *loc. cit.* p. 225.

[2] Alice Lee and Karl Pearson, A First Study of the Correlation of the Human Skulls. *Phil. Trans. Roy. Soc.* Series A, Vol. 196, p. 247, 1901, London.

[3] T. Wingate Todd, Mathematical Calcu'ation of Cranial Capacity. *Amer. Journ. Phys. Anthropology*, Vol. VI, p. 138, 1923. Washington, D. C.

[4] M. R. Drennan, A Contribution to the Piltdown Problem, *Nature*, p. 874 (Dec. 17, 1927).

As a result of the application of these different methods, in 67 skulls altogether, the cubic capacity could be estimated, five according to Lee-Pearson, twenty according to Wingate Todd and forty-two according to Drennan. The average cranial capacities, thus calculated, are given below :—

Lee-Pearson 2♂	1,476·2 c.c.
„ 3♀	1,364·4 c.c.
Wingate Todd 20♂	1,482·6 c.c.
Drennan 42♂	1,362·7 c.c.

Taking the figures calculated according to Lee-Pearson and Todd's formulae, the average cranial capacity of 22♂ skulls is 1,481·5 c.c. which is considerably higher than the average of 42 obtained from Drennan's formula. It is possible that in the latter case the somewhat lower average cubic capacity may have been due to the inclusion of a few female crania, as accurate determination of sex from an examination of the back portions only is difficult, specially in a primitive people like the Nagas, whose women are given to a hard outdoor life and may not betray sexual peculiarities so markedly as in races that have been living through a long period of civilization.

In his account of the craniology of the Hill Tribes of the North-East Frontier of India and Burma, Sir William Turner [1] has given the cubic capacity of 7 male and 1 female adult skulls of Tonkal Nagas of Hwining about 40 miles north-east of Manipur. Prof. Thane [2] has also published the cranial capacity of 5 adult Nagas (3 males and 2 females) from the Patkoi mountains. Both these localities are somewhat west of the region represented in our collection but contiguous to it. The average cubic capacities of the 7 males and 1 female given by Turner are 1,501 c.c. and 1,250 c.c. respectively and those of Thane are 1,377 c.c. and 1,237 c.c. for males and females. Prof. Thane's average for males agrees very well with the average of our 42 obtained from Drennan's formula but is somewhat lower than the averages of our male and female skulls calculated according to Lee-Pearson and Todd formulae. Sir William Turner's average for the 7 males is considerably higher than all given here, while his figure for the female skull is in agreement with that of Prof. Thane but appreciably below ours. Both Turner's and Thane's results were obtained by direct measurements whereas ours were obtained by calculation. Turner,[3] however, speaks of his figures as only 'approximate' estimations due to the broken conditions of the basal parts of the skulls and they consequently may have been higher than the true capacities of the skulls examined by him. An attempt was made to apply the Lee-Pearson formula to his skulls and the average cubic capacity calculated was found to be 1,627 c.c., an even higher figure, probably due to using the basi-bregmatic height instead of the auricular. The latter gives a more reliable indication for the calculation of cranial capacity than the former, but is unfortunately not included in Turner's list. By using Todd's formula No. 1 for calculating cubic

[1] *loc. cit.* p. 723.
[2] Thane, G. D., *Journal of the Royal Anthropological Institute*, Vol. XI, pp. 215-219, 1882. London.
[3] *loc. cit.* p. 719.

capacity from the maximum length, the average obtained for Turner's 7 male skulls was only 1,388·23 c.c. and thus strengthens the supposition that the average obtained by Turner from direct measurement was too high. If we now add the average cranial capacity of 42 skulls obtained from Drennan's formula to those of the 3 of Prof. Thane and 7 of Prof. Turner (as calculated from Todd's formula No. 1) we get a grand average of 1,367 c. c. for 52 male skulls against 1,481 c. c. for 22 male skulls obtained from Lee-Pearson's formula No. 10 and Todd's formula No. 3. According to the former, therefore, the average cranial capacity of the Nagas would be slightly lower than the average of modern Europeans, while according to the latter somewhat higher.

Facial characters (Figs. 1, 4, Plate II, Figs. 1, 5, Plate III, Fig. 1, Plate IV, and Fig. 1, Plate V).

In facial characters the majority of the skulls conform to the Mongelian type in the moulding of the forehead, the flattened and upwardly drawn nasal root, the prominence of the zygomatic arches and the forward projection of the cheek bones, together with a general smoothness of the entire facial part. A minority, however, discloses a sharp difference in the conformation of the forehead and nasal root, whose significance on the general question of the racial composition of the Nagas will be discussed later.

Speaking generally, among the Nagas the forehead inclines to be vertical, and the glabella is by no means marked. It is narrow, the minimal breadth in 59 males being 92·7±0·43 and in 24 females 88·7±0·52 but broadens out considerably in the temporal region; the breadth of this part being 109·9 ±0·46 and 106·7±0·56 respectively, a characteristic, also noted by Thane,[1] which is responsible for the ovoid shape of the skull when viewed from the top.

The root of the nose is usually broad and flat, though in some it is distinctly sunken. The nasal bridge is flat and broad and projects very little in front of the internal orbital margins; in a few, however, the prominence of the bridge is quite conspicuous. The average interorbital (maxillo-frontal) diameter in 58 males is 20·2±0·16 and in 24 females 19·7±0·23, both of which are high figures. The nose with few exceptions is short and broad, the average length and breadth in the male and female series being 50·1±0·27, 26·8±0·16 and 48·5±0·38, 25·3±0·21 respectively, giving a chamaerrhine index of 53·6±0·38 and 52·3±0·54. In 55 adult skulls the nasal sill is smooth and continuous with the incisive fossae, while in 51 it is marked off by a more or less defined ridge.

The orbits are very high; the proportion of the height to the breadth is 86·9±0·47 in the males and 91·4 ±0·76 in the females; a high orbit in a short face being a distinctly Mongolian characteristic.

The face is broad, but not markedly so in the females; the average bizygomatic breadth being 130·5±0·56 and 123·4±1·09 in the two series. In proportion to the length it is quite short, the average superior facial index in 45 males is 50·3±0·3 and in 12 females it is 50·6±0·61 only.

[1] Thane *loc. cit.* p. 216.

A large number of specimens exhibit a tendency to the forward projection of the subnasal part of the face. In a few the degree of projection is very marked, as can be seen from the measurements given in Tables XI-XIV.

The palate is extremely broad and the dental arcade tends to be parabolic in shape. The mean palatal index for 51 males is 91·56±0·95 and the mean maxillo-alveolar index is 123·74±0·64 ; in 24 females the respective figures for the two indices are 88·86±1·02 and 124·92±1·18.

Teeth.

The teeth are small. In 8 male and 1 female skulls only could the dental index be calculated ; the averages for the two being 40·45 and 40·91 respectively. They are as a rule free from disease. Only in two cases patches of caries were noticed, in N 17 the right second molar and in N 53 the right second molar, the left second premolar and the first molar being affected. There is, however, a considerable amount of erosion of the teeth. In 62 adult skulls, 14 show a marked wearing-down of the surfaces with the dentine freely exposed, in 16 the erosion is moderate and in 22 slight. There were only 8 specimens in which the surfaces were intact. Sir Arthur Keith [1] has suggested that the admixture of dust or grit with food is the chief cause of this wear seen in so many prehistoric and primitive peoples. This appears to be the most probable explanation of the erosion of teeth among the Nagas, whose habits suggest a not very clean handling of food.

Shovel-shaped incisors (Figs. 3-4, Plate V) were noticed in 10 specimens but as in many cases the incisors have fallen out, the actual occurrence of this type of teeth may have been much greater. Hardlicka [2] has noted its frequent occurrence among the Red Indian Tribes. If its frequency is really a Mongolian trait, as is suspected, its presence among the Nagas is not wholly unaccounted for.

Position of the External Auditory Meatus.

The position of the auditory meatus in the total length of the skull is a matter of some importance. A method has been devised [3] to accurately determine the meatal position by dropping a perpendicular from the centre of the meatus in the Frankfort Plane to the Calvarial base line. Unfortunately only in a single skull could this position be measured, the meatal position index being 41·77. We are not yet in possession of sufficient data to understand the variations of the meatal position in different races. The average index obtained by Sewell and Guha [1] in 3 adult skulls from Mohenjo-daro is 48·1 ; in 5 Veddahs it is 51·43 ; in 20 Tasmanians 51·49 ; in 20 Australians 53·01 and in 3 from Aditanallur 54·06. As compared to these figures, the Naga index is much smaller and does not indicate any remarkable post-auricular development such as is seen in the other skulls.

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[1] *loc. cit.* p. 239.

[2] Hardlicka, A., *Anthropometry*, p. 116, 1920. Philadelphia.

[3] R. B. S. Sewell and B. S. Guha, Report on the Human Remains excavated at Mohenjo-daro and the Indus Valley Civilisation in Mohenjo-daro, edited by Sir John Marshall, Chap. XXX, p. 607, London, 1931.

Racial Types.

In the foregoing account of the general characters of the skulls mention has been made of the absence of homogeneity in the series. In the majority of the crania (Plates II-V) the forehead is smooth, the glabella is not marked and the superciliary ridges insufficiently differentiated from the supra-orbital. The root of the nose is flat and drawn upwards into the forehead and the bridge projects very little in front of the internal margins of the orbit when seen in profile. The nasal sill is more usually smooth and is continuous with the incisive fossae. An examination, however, shows that there is a definite minority which lack all these features. Out of a total of 86 skulls, 24 belong to this group. In these the structure of the forehead and nose is markedly different (*vide* Plate VI). There is a great massing of bone at the glabella, the superciliary arches very prominent and clearly demarcated from the supra-orbital. The nasal root is not flattened but sunken, the bridge prominent and the lower margins of the pyriform aperture as a general rule are clearly demarcated by a ridge.

In a recent paper Sir Arthur Keith [1] has called attention to the fact that the broad flattened face of the Mongolian race is due either to a forward growth of the cheek bones or to the retrocession of the nasal parts of the face and in some cases, as among the Chinese, to the joint operation of both the factors. In his opinion the existing craniological methods fail to bring out the racial differences in these features and he has devised a method to record the facial projections from a vertical plane passing through the centre of the external auditory meatus at right angles to the Frankfurt Horizontal.[2]

We propose to apply Keith's method in the present case in order to bring out the differences between our two groups. For this purpose 4 male adult skulls were taken from Group I and 4 male adult from Group II ; the 4 skulls from the latter being the only ones in which the meatal cavities are intact and accurate measurements of the projections of the various parts of the face from the transauricular axis possible.

In Tables XI-XIV are given the measurements of the projections of the face as described by Keith. Column A gives the projection of the glabella or the length of the preauricular part of the skull. The average glabellar projection of the 4 males of Group I is 88·5 mm. The average of the 4 male adults of Group II is 93·7 mm. or a difference of 5·2 mm. between the figures of the two groups. Column D shows the projection of the nasion. In Group I males the average is 86·4 mm. In other words the glabella in these skulls projects 2·1 mm. beyond the nasal root. In Group II on the other hand the projection of the nasion is 87·2 mm. or a difference of 6·5 mm. between it and the glabellar projection. These measurements bring out very clearly the sharp difference between the two groups in the modelling of the lower part of the forehead and the nasal root and show the large accumulation of bone at the glabella in Group II which makes the sub-glabellar notch so deep.

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[1] Keith, Sir Arthur, Human Skulls from Ancient Cemeteries in the Tarim Basin, *Journ. Anthropol. Inst.*, Vol. LIX, pp. 168-171 (1929).

[2] *loc. cit.* pp. 167-180.

In the great depth of the sub-glabellar notch Group II approaches the 2 male Mohenjo-daro skulls[1] of the Proto-Australoid type where it is as high as 8·5 mm.

In this connection it is instructive to compare the maximal supra-orbital width between the outer ends of the fronto-malar junctions which is correlated with the development of the supra-orbital ridges and is an indication of their absolute size.[2] The average supra-orbital width in the males of group I is 102 mm. as against 106·37 mm. of Group II.

Column C gives the projection of the lateral wall of the orbit and column B shows the extent to which the tip of the nose lies in front of it. In Group I males the lateral orbital point lies 71·5 mm. in advance, as noticed in the Chinese skulls, but are closer to the intermediate Loulan type to be judged from figures published by Sir Arthur Keith.[3] In the matter of nasal projection our data, unfortunately, are very incomplete. As a result of the scraping off of the nasal bones, only in two skulls, *e.g.* N 179 from Group I and N 182 from Group II, could the projection be measured. In the former the tip of the nose lies 21 mm. in front of the lateral orbital wall against 30 mm. in the latter. The figures are very significant and bring out the difference between the two groups in a very characteristic manner.

By subtracting E from B, the projection of the nasal bone beyond the ascending process of the maxilla can be ascertained. In this respect again our materials are equally unsatisfactory as the projection could be measured only in the aforesaid two skulls. In N 179 of Group I the nasal bones are 2 mm. and in N 182 of Group II 4 mm. in front of the maxilla. The former is closer to the Loulan and the Chinese and does not show the prominence of the nasal bones as seen in the latter.

Another way of measuring the differences in the projection of the nose is that provided in Column J. This gives the height of the dorsum of the nose from the inferior orbital margins. In N 179, Group I, this is only 16·5 and in N 182, Group II, it is 25 mm. In the Chinese measured by Sir Arthur Keith it is as low as 14·5. Though in N 179 of Group I the height of the dorsum of the nose is somewhat greater than that of the Chinese, the essential Mongolian flatness is there in contrast to the great orbito-nasal height of skulls belonging to Group II as shown in N 182 which is closer to the Iranian type in this respect.

The projection of the cheek bones is measured by column I. In the male skulls in Group I the cheeks are 1·0 m. and in Group II 1·5 m. in front of the lateral margins of the orbit. In both these groups the forward position of the cheek bones is slightly less than that of the Chinese but in their advance from the orbital wall both show characteristic Mongolian traits.

In Column F are given the measurements of the projection of the least advanced part of the nose from the mid-meatal point. The average for Group I is 84 and that of Group II 85·3 mm. The differences between the least advanced part of the nasal margin and the malo-maxillary

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[1] Sewell, R. B. S., and Guha, B. S., *loc. cit.* Chap. XXX, p. 648.

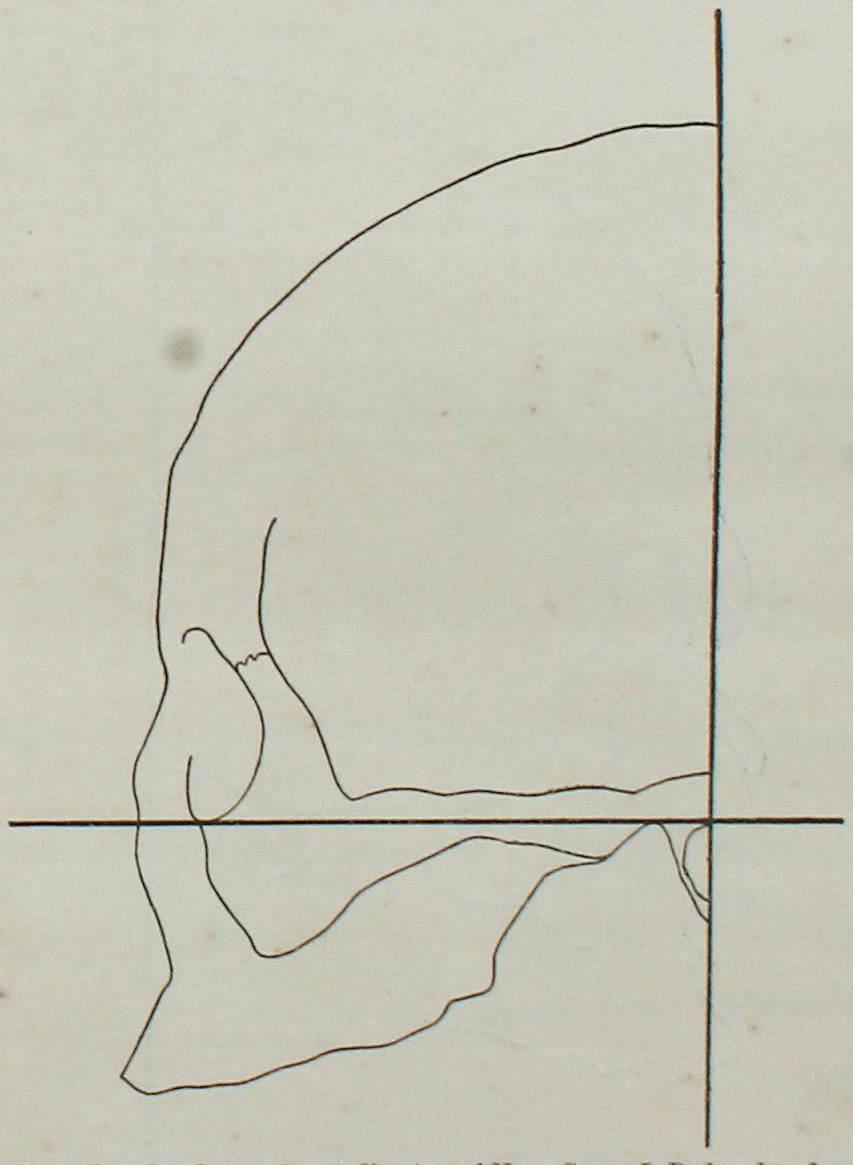
[2] Keith, Sir Arthur, Report on the Human Remains in Ur. Excavations Vol. I. Al-Ubaid, p. 229, Oxford, 1927.

[3] *loc. cit. Journ. Anthropol. Inst.*, Vol. LIX, p. 180.

point are 13·5 mm. and 14·4 mm. in Group I and Group II respectively against 12·5 mm. in the Chinese.

Although the figures are slightly higher in our series they are essentially the results of the same causes as the Chinese, namely a retrocession of the lateral nasal walls accompanied by an advance of the masseter point. These two factors, as Sir Arther Keith has pointed out, account for the flattening of the lower nasal region so characteristic of the Chinese face. Group I, and in a lesser degree Group II show the same traits.

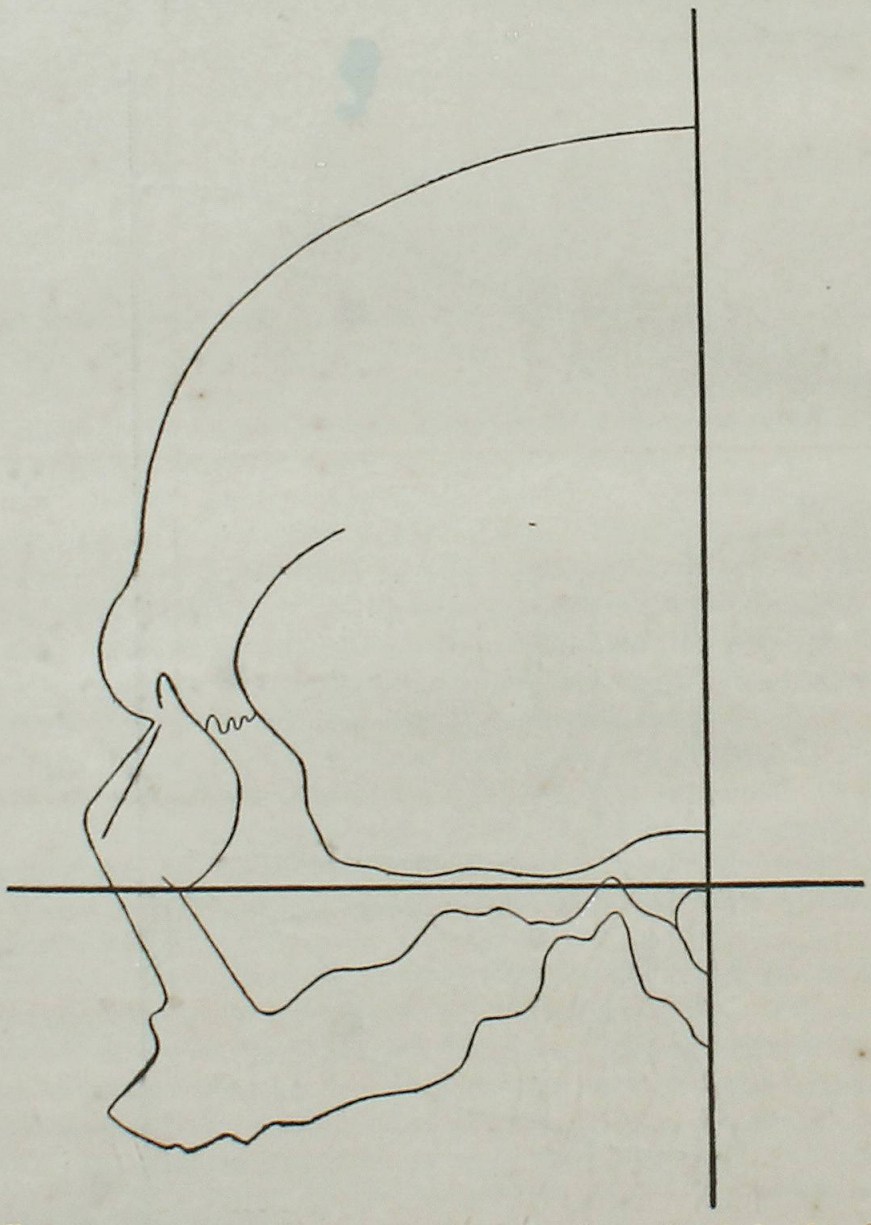
The projection of the cheeks can be ascertained again by measuring the forward growth of the zygomatic arches which support the cheek bones. The averages of the measurements given in Tables XII and XIV show that in the advance of the Zygomatic arches the difference between Group I and Group II is not marked, the latter tending to be slightly more so. The average figure for Group I is almost the same as that of the Chinese. The figures given in Tables XII and XIV thus support the conclusion arrived at previously regarding the forward growth of the cheek bones among both the Naga groups which is essentially a Mongolian character.



Text-Fig. I.—Composite profile view of Naga Group I. Reduced to ⅔.

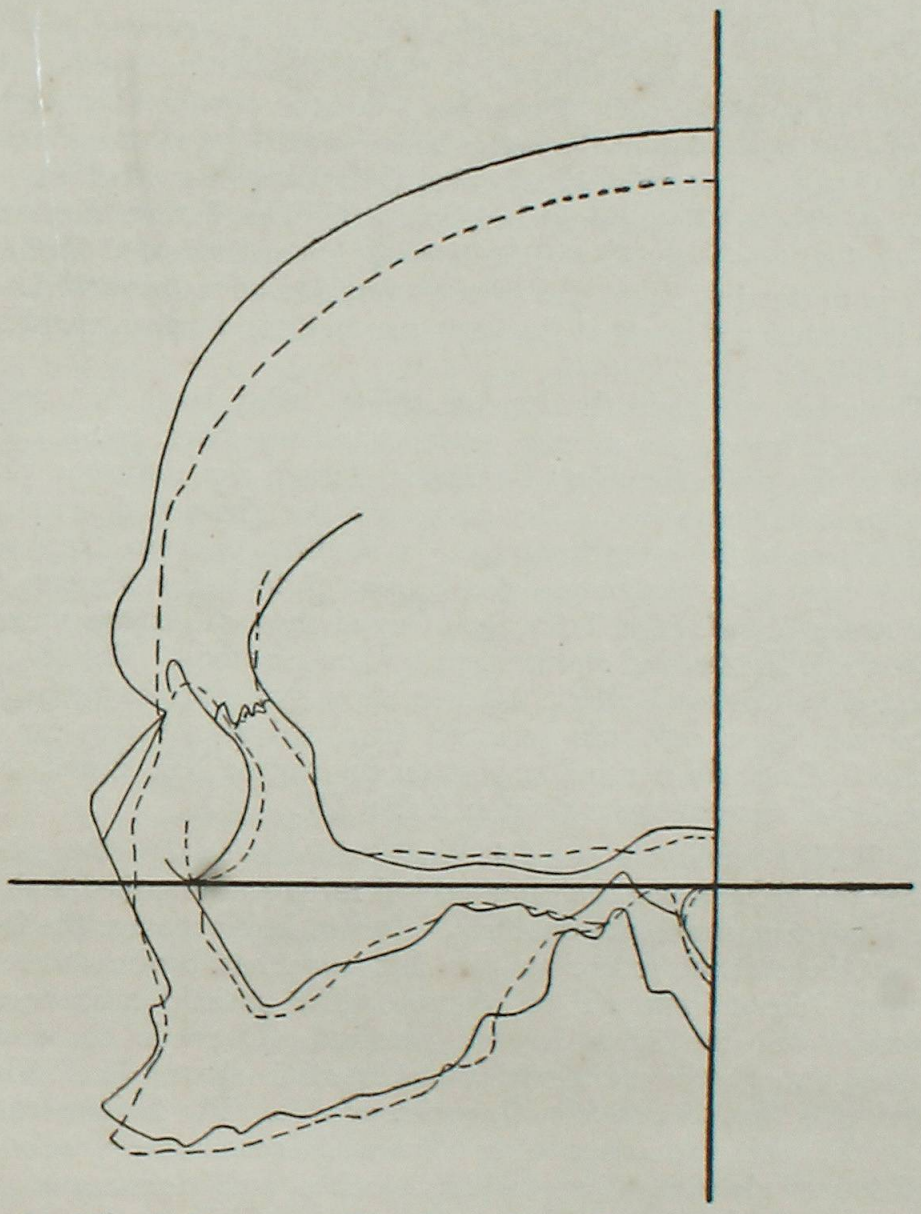
The figures in Columns G and H of Tables XI and XIII give measurements of the projections of the subnasal and alveolar (upper) regions beyond the root of the nose and provide more reliable means of determining the forward projection of the face than that given by facial angles and indices. In Group I the subnasal prognathism is 3·1 and in Group II 2·6. In Group I the alveolar prognathism is 8·2 and in Group II 7·2. Group I, therefore, is more prognathic than Group II in both the subnasal and alveolar regions. In the Chinese measured by Sir Arthur Keith there is no subnasal prognathism and only 4·5 in the alveolar but in the Negros (Keith) the subnasal and alveolar projections are 4 mm. and 10 mm. respectively.

To sum up, in the forward development of the cheeks and the amount of prognathism the differences between Group I and Group II are not striking. Both display in these matters essential Mongolian characteristics. But in the development of the nose and the forehead the differences are fundamental. While Group I is unmistakably Mongolian in these



TEXT-FIG. II.—Composite profile view of Naga Group II. Reduced to $\frac{2}{3}$.

characters also, Group II discloses characteristics associated with the Australoid type. In the text-figures I-II, the composite profiles of Group I and Group II are given. When these are superimposed as in text-figure III the differences between the two types mentioned above are brought out very clearly.



Text.-Fig. III.—Profile views of Naga Groups I and II superimposed. Reduced to ⅓.

Affinities with other races.

In comparing our results with those of other Naga tribes the only materials available are—

(i) An account of 5 Naga skulls—3 male and 2 female from the Patkoi mountains published by Thane.[1]

(ii) 8 Naga skulls—7 male and 1 female—from Hwining described by Sir William Turner.[2]

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[1] Thane, George D., *loc. cit.* pp. 215-219.

[2] Turner, Sir William, *loc. cit.* Vol. XXXIX, pp. 717-723.

The skulls described by Thane are ovoid in shape with an average cranial index of 78·1 in the males and 78·0 in the females. They are of moderate capacity, the average cubic capacity being 1,377 c.c. The vault as well as the orbits are high but the nose is flat and broad (N. I. 53·3). The palate is extremely broad, the average palato-maxillary index being 125 and the dental arch parabolic in form.

The cranium is smooth and the "glabella prominence and brow ridges are reduced to a minimum". The bridge of the nose is flat but the root is not depressed. Thane has noted the considerable degree of the forward projection of the malar bones and taking all the characters together has no hesitation in affirming their Mongolian affinities.

In the Tonkal Nagas described by Sir William Turner, the form of the cranium is also ovoid with an average cranial index of 76·4. The vault is moderately high, the average vertical index being 75·7. The nose is flat but not broad at the lower margins, the average nasal index being 49·7.

The orbits are high, the average orbital index being 92·2 and the palate very broad, the average palato-maxillary index being 128·9.

As in the skulls described by Thane, Turner also notices a general smoothness of the surfaces in his crania and the absence of prominence of the ridges in the lower forehead. In addition to these, there are in the collection of the Anthropological Section of the Indian Museum three Naga skulls, 2 males and 1 female. One of these skulls was presented by Dr. J. H. Hutton and another lent by him for study. The third was presented by Captain Butler. All these three skulls are supposed to be of Angami Nagas and were procured from regions not very far from Kohima. The skulls sent by Dr. Hutton are marked NH 1 and NH 2 in the list of measurements given in Table XV.

Skull NH 1 belonged to an adult female with the facial portion missing. Neither the glabella nor the supra-orbital regions are marked and muscular attachments are not prominent. Due to long exposure the frontal part at the coronal suture on the left side has become somewhat separated—about 5 mm. on an average. The parietal eminences are prominent and the inion is well marked. There is no occipital flattening though the maximum cranial length is short. Skull NH 2 is undoubtedly that of a male in the prime of life. The facial portion as well as the basis cranii are missing. The vault is moderately keeled with a well formed glabella and superciliary arches well demarcated from the supra-orbital ridges. The occiput is 'cap'-like and there are several wormian bones at the left asterion.

Skull 493 belonged also to a male in the prime of life. The skull is complete with the lower jaw. The glabella is not marked but the superciliary arches are differentiated from the supra-orbital. The vault is very high but not keeled. The occiput is moderately bulging and the skull belongs intrinsically to the dolicho-cranial type.

The Naga skulls described by Thane and Turner and those just mentioned (with the possible exception of NH 2) agree in all essential characters with the skulls of Group I and there cannot be any doubt about their racial identity. This type, characterised by the presence of the usual Mongolian flat face and nose with a long but high skull vault

appears to be the prevailing type in the entire Naga Lushai-Chin regions [1] and is radically different from the broadheaded Mongolian races like the Kachins, the Siamese and the Burmese that lie further east and south. But the question remains as to what race does the Group II of our series belong ? And how is the presence of this type among the Nagas to be accounted for ?

In the course of his investigations Dr. J. H. Hutton was struck by the close cultural affinities between the Naga Hills and Oceania, specially Melanesia.[2] He has also in a recent communicaton called attention to the presence of frizzly hair among the Angami Nagas.[3] Now the Oceanic races who have spirally curved hair and are characterised by similar characters in the lower forehead are the Papuans, who are widely scattered over Melanesia. The extinct Tasmanian race was also known to possess similar hair-form and features.

In an excellent account of 8 male and 7 female Papuan skulls from New Guinea Dr. George A. Dorsey has published very valuable data for comparative purposes.[4] The male skulls described by him are dolicho-cranial with strongly developed glabella and supra-orbital ridges and show subnasal prognathism. Unfortunately, however, Dr. Dorsey has not published profile tracings of any of these skulls and it is therefore impossible to compare their facial projections with those of Group II. Fortunately, however, in his great work on the races and cultures of New Caledonia and Loyalty Islands Dr. Fritz Sarasin [5] has not only published a great mass of metric data of the Papuan or Melanesian inhabitants of these islands but has given very valuable photographs of Papuan skulls from which accurate profile tracings could be made. These photographs are published with the mesurements, etc. The first four of the photographs, from Plates LI and LII [6] of New Caledonian skulls were taken and their profile tracings to actual size were drawn by camera lucida. These skulls are all dolicho- and hypsi-cranial with a mean length-breadth index of 74·15 and length-height index of 77·9 and are, therefore, not unlike the Naga skulls in general shape (Text-figure IV gives the composite profile view of these four skulls). In Table XVI are given the facial projections and in Table XVII the projections of the cheek bones from the transauricular axis. On comparing these figures with those of Group II the much greater glabellar projection in the Melanesian skulls is at once noticeable—the difference between the means of the two groups being as high as 8·7. In the depth of the sub-glabellar notch, however, the differences are not so marked. In the former the depth is 8·4 mm. against 6·5 in the latter.

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[1] Turner, Sir William, *loc. cit.* p. 723.

[2] J. H. Hutton, Assam and the Pacific, *Man in India*, Vol. IV, pp. 1-13, Ranchi, 1924.

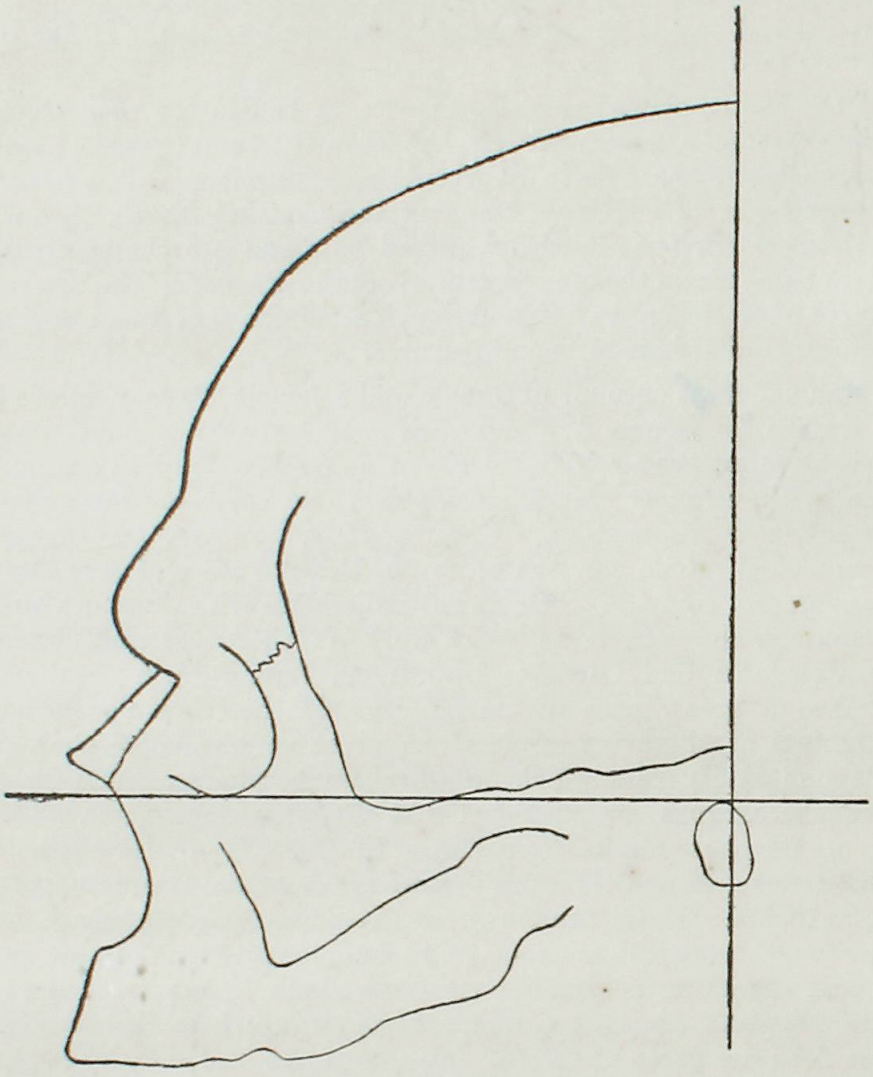
[3] J. H. Hutton, A Negrito Substratum in the Population of Assam. *Man in India*, Vol. VII, pp. 257-262, 1927.

[4] George A. Dorsey, Observations on a collection of Papuan crania. Publications of the Field Columbian Museum, Anthro. Series, Vol. II, pp. 1-40, Chicago, 1897-1913.

[5] Fritz Sarasin, Anthropologie der Neu-Caledonier und Loyalty Islands, Vol. C, Berlin, 1916-1922.

[6] Atlas zur Anthropologie der Neu-Caledonier und Loyalty-Insulaner, Plates LI and LII, Berlin, 1922, and Vol. C, pp. 526-528 (Serial numbers 152, 159, 147 and 148).

In the Melanesian skulls the nasal projection is also greater, the nasal bone on the average lying 5·8 mm. in front of the ascending process of the maxilla, against 4 mm. in skull No. N 182 of Group II.



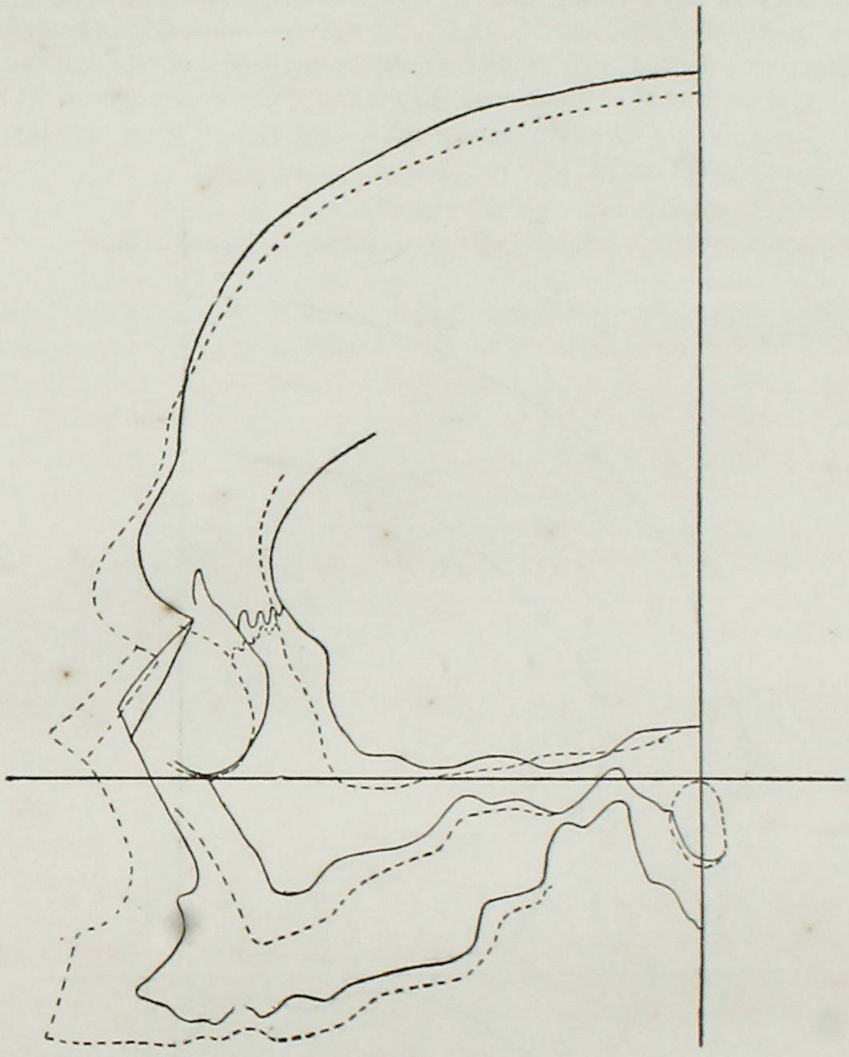
TEXT-FIG. IV.—Composite profile view of Melanesian skulls. Reduced to $\frac{2}{3}$.

So far as the projection of the cheek bones are concerned, though the absolute figures are higher in the Melanesian skulls as shown in Table XVII and column I of Table XVI, in reality, however, there is not that advance as seen in Group II or in the typically Mongolian skulls such as the Chinese. The actual advance of the cheek bones is only 0·7 compared to 1·5 in Group II.

In the Melanesian skulls again there is not that retrocession of the nasal parts as seen in Group II. The difference between the least advanced part of the nasal margin and the malo-maxillary point is 21·7 mm. against 14·4 mm. in Group II.

In the Melanesian skulls as compared to Group II, both subnasal and alveolar prognathism is very much greater. These are 10·2 mm. and 14·0 mm. against 2·6 and 7·2 in Group II.

In fine, as compared to the skulls belonging to Group II, the Melanesian skulls of New Caledonia (*see* Text-Fig. V where the composite profile

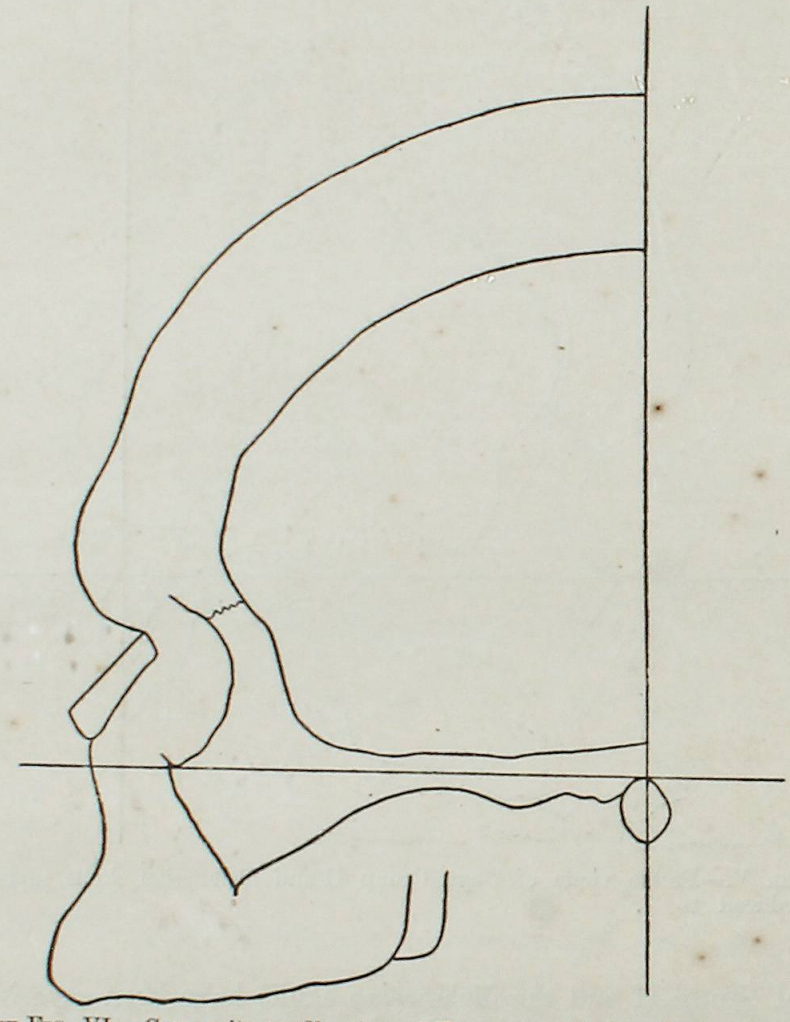


Text.-Fig. V.—Profile views of Naga Group II and Melanesian skulls superimposed. Reduced to $\frac{2}{3}$.

views of Group II and the Melanesian skulls have been superimposed) show greater absolute lengths from the antero-posterior plane and have much greater glabellar projection and nasal height. But the modelling of the lower forehead and nasal root are similar and belong to the same fundamental type as against the typical Mongolian skulls of Group I, though the forehead is less receding and the vault somewhat higher in Group II. In the Melanesian skulls, however, there is not that advance of the cheek bones nor do they show any noticeable retrocession of the nasal wall as found in both Group I and Group II. As contrasted with the latter two groups again there is a more pronounced degree of prognathism in the Melanesian skulls both in the subnasal and alveolar regions.

Coming to the other race in Oceania with spirally curved hair, namely, the extinct Tasmanians, all anthropologists are indebted to Berry and

Robertson [1] for the excellent dioptographic tracings of Tasmanian skulls published by them. These authors published in four normae tracings of 52 Tasmanian skulls from various museums of Australia of which 30 are male, 21 female and 1 child. Twelve of the well-preserved male skulls were selected and measurements were taken of the various parts of the face from the trans-auricular axis. These are given in Tables XVIII and XIX. A composite p ofile view also of these twelve skulls is given in Text-Fig. VI.



TEXT-FIG. VI.—Composite profile view of Tasmanian skulls. Reduced to $\frac{1}{3}$.

As compared to Group II the mean glabellar projection of the twelve Tasmanian skulls is only 0·4 in excess. In the depth of the sub-glabellar notch the difference between the two is only 0·2.

In the Tasmanian skulls the projection of the nose is much less than that of Group II, with a difference of 1·7. In this respect of course the comparison is not satisfactory as in only 1 skull in Group II could the nasal projection be measured.

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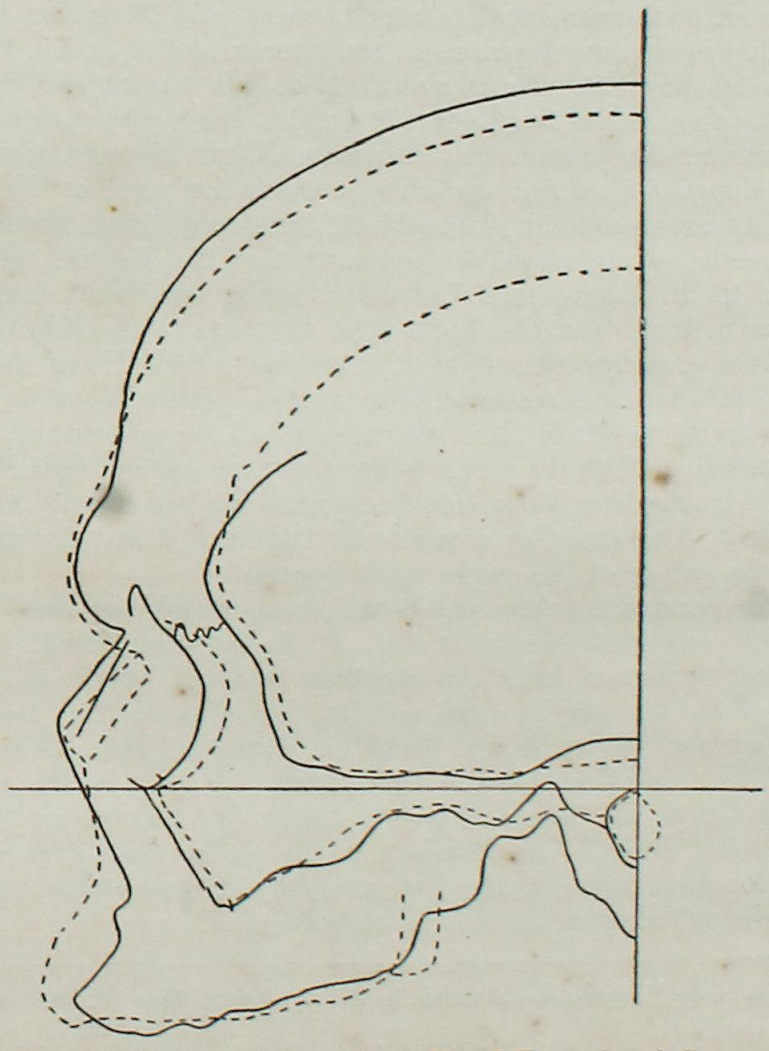
[1] Berry, R. J. A. and Robertson, A. W. D., Dioptographic Tracings in four Normae of Fifty-two Tasmanian crania. *Trans. Roy. Soc. Victoria*, Vol. V, Melbourne, 1909.

So far as the development of the cheek bones are concerned the Tasmanian skulls not only do not show any advance beyond the lateral orbital walls but are actually 1 unit behind it.

The Tasmanian skulls again, unlike Group II, do not disclose any sign of the retrocession of the nasal part. The difference between the least advanced part of the nasal margin and the malo-maxillary point in the case of the former is 21·5 mm. against 14·4 mm. in Group II.

Similarly, as compared to Group II, the Tasmanian skulls show a much greater degree of prognathism both in the subnasal and alveolar regions. While Group II shows only 2·6 mm. and 7·2 mm. of prognathism in the subnasal and alveolar regions respectively, the Tasmanian skulls reveal 8·2 mm. and 11·8 mm. as the measure of projection of the same regions beyond the nasal root.



Text-Fig. VII.—Profile views of Naga Group II and Tasmanian skulls superimposed. Reduced to $\frac{2}{3}$.

To sum up, the Tasmanian skulls agree very closely with the skulls belonging to Group II of our Naga series in the conformation of the lower part of the forehead and nasal root. The similarity in this case is much

greater than that shown by the Melanesian skulls with Group II. So far, however, as the advance of the cheek bones and the retrocession of the nasal walls are concerned, the Tasmanian skulls, like the Melanesian crania, are entirely different from Group II. This is well brought out in Text-Fig. VII, where the profile views of the two series are superimposed. Lastly while the Naga skulls belonging both to Group I and Group II evince a considerable amount of prognathism in the subnasal and alveolar parts of the face, the degree of projection in the Tasmanian and Melanesian skulls is very much greater.

As a result of these comparisons we may conclude then that the Group II of the Naga crania agrees with both the Melanesian and Tasmanian skulls in the formation of the lower forehead and nasal root, showing undoubted "Australoid" characters in these respects. It shows, on the other hand, equally distinct projection of the cheek bones and the retrocession of the nasal wall, characteristic of the Mongolian races.

During recent investigations in the interior of the Cochin Hills, the presence of a typically Melanesian form of hair was noticed by one of us among a section of the Kadars.[1] In this latter case other Negroid features were also present but among the Nagas miscegenation with a strong Mongoloid element probably accounts for some of the distinct Mongolian features seen in Group II. Taking everything into consideration it seems not unreasonable to assume that the Negroid element, as revealed in the Papuan and Tasmanian skulls, was fairly extensive at one time in India from the North-East Frontiers to the South-Western extremities and that this element must have been driven southward into Oceania by later movements of people—persisting only in a few isolated tracts to which these movements had not penetrated. In the case of the Naga Hills the earlier Negroid element has not been altogether absorbed by the later Mongoloid immigrants but has greatly intermixed with them. This probably accounts for the cultural and physical affinities of the people of this region with Oceania.

Before concluding this report we must record our deep sense of obligation and gratitude to Lt.-Col. R. B. Seymour Sewell, Director, Zoological Survey of India, for constant help and advice and through whose efforts the skulls were sent to this Museum for study. Our thanks are also due to Messrs. Bajra K. Chatterjee, M.Sc., Himansu K. Bose, M.Sc., and Panchcowrie Chakravaty for help in the statistical working out of the data and Babus Abhoy Ch. Chowdhuri, Sibcharan Mondol, and Subodh Ch. Mondal, Artists of the Zoological Survey of India, for the drawing of the Map, photographs and outline tracings of the skulls published along with this report.

[1] B. S. Guha, Negrito Racial Strain in India. *Nature*, May 19, 1928 and June 22, 1929.

TABLES I—XIX.

TABLE I.

Naga Males.

Measurements.

Skull No.	64	105	118	205	215
1. Max. cranial length	..	..	..	..	..
2. Max. cranial breadth	..	..	..	..	136
3. Auricular height	121	..	..	..	114
4. Basi-Bregmatic height	132	..	..	..	..
5. Least Front. breadth	95	96·5	95	94	93
6. Greatest Front. breadth	112	111	110	111·5	110
7. Max. Bizy. breadth	130	137	134	128	..
8. Bimalar breadth	93·5	105	108	97	92
9. Bimastoid breadth	105	..	..	..	..
10. Nasion-Basion line	105	..	..	..	..
11. Prosth.-Basion line	98	108·5	108	..	..
12. Nasion-Inion length	..	..	..	..	..
13. Nasion-Prosth. line	68	70	70·5	60	62
14. Nasal length	51	53	55	51	47
15. Nasal breadth	27·5	29	27	24·5	27
16. Inter-orbital breadth	20	18·5	20	21	19
17. Orbital breadth	39	41·5	41	38·5	39·5
18. Orbital height	34	33	35	32	35
19. Bi-orbital breadth (outer)	102·5	110	110	101·5	106
20. Bi-orbital breadth (inner)	95	98	103	93	98
21. Bi-orbito Nasal arc	104	103	113	110	104
22. Maxil.-alv. breadth	63	64·5	71	62	59
23. Maxil-alv. length	52	61	58	51	48
24. Palatal length	35	42·5	45	38	37
25. Palatal breadth	35·5	38	42·5	34	36
26. Length of Occ. foramen	37	..	..	..	..
27. Breadth of Occ. foramen	30	..	..	..	..
28. Horizontal circumference	..	..	..	..	..
29. Transv. cranial arc	298	..	..	..	293
30. Sagittal arc	..	..	..	..	..
31. Frontal arc	127	129	..	130	119
32. Parietal arc	..	..	..	..	124
33. Frontal chord	111	114	..	114	101
34. Parietal chord	..	..	..	..	108
35. Occipital chord	..	..	..	..	..
36. Distance between Nasion and Glabella.	11	14	12	12	10
37. Bregma position line	..	..	..	..	..

TABLE I.

Naga Males.

Measurements.

209	219	217	207	216	44	39	47	54
..	..	..	..	..	..	..	..	..
140	..	..	..	..	..	..	..	..
121	..	125	118	..	..	..	..	..
..	..	..	127	..	..	..	..	..
95	101	87	96	93	93	85	92	92
113	110	107	..	120	..	108	110	107
133	138	123	132	..	..	..	..	123
102·5	112	98	94	..	95	..	93	96
..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..
..	..	..	83	..	..	..	..	..
69	75	62	59	59	61·5	..	61	73
50	51	50	50	44	43	..	48	52
27	30	24	26	25	27	..	27·5	25
17	24	19	22	20	23	..	22	20
40	40	38	40	35	37	..	34	38
35	35	29	34	35	36	..	33	35
103·5	113	99	104	100	101	..	98	101
97·5	104	93	97	92	94·5	..	89	96
102	110	99	102	98	101	..	94	103
68	66	62·5	59	..	..	..	60	63
50	64	55	47	..	..	..	45	53
37	47	46	36	..	..	..	36	43·5
39	41	35	35	..	..	..	36	36
..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..
310	.	303	291	..	..	..	..	..
..	..	..	..	..	..	..	..	..
125	128	..	..	122	..	130	127	..
129	..	122	..	..	..	..	..	..
109	113	..	..	107	..	..	..	..
113·5	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..
13	11	11	10	14	13	11	11	9
..	..	..	..	..	..	..	..	..

TABLE I.

Naga Males.

Measurements.

Skull No.	58	60	63	103	15
1. Max. cranial length	..	..	..	..	..
2. Max. cranial breadth	..	..	..	..	..
3. Auricular height	125	..	128	..	128
4. Basi-Bregmatic height	136	..	138·5	..	133
5. Least Front. breadth	91	93·5	87·5	100·5	91
6. Greatest Front. breadth	110	..	114	106	106
7. Max. Bizy. breadth	129·5	132	134	133	126
8. Bimalar breadth.	103	105	102	103	103
9. Bimastoid breadth	..	..	..	..	..
10. Nasion-Basion line	100	101	108	..	97·5
11. Prosth.-Basion line	96·5	92	96·5	..	97
12. Nasion-Inion length	..	..	..	..	..
13. Nasion-Prosth. line	66	64	71	69	66
14. Nasal length	51	53	52	54	51
15. Nasal breadth	28	29	27	29	26·5
16. Inter-orbital breadth	21	20	19	24	18
17. Orbital breadth	39	38	39	41	36·5
18. Orbital height	36	33	36	36	32
19. Bi-orbital breadth (outer)	102	105	101	109	99
20. Bi-orbital breadth (inner)	95	94·5	95	101	91
21. Bi-orbito Nasal arc	100	102	99	111	96
22. Maxil.-alv. breadth	66	62	64	70	66
23. Maxil.-alv. length	54·5	51	52	55	55
24. Palatal length	42	41	43	44	45
25. Palatal breadth	36	36	37	39	39
26. Length of Occ. foramen	..	..	..	..	39
27. Breadth of Occ. foramen	..	..	..	..	26·5
28. Horizontal circumference	..	..	..	..	..
29. Transv. cranial arc	272	..	312	..	292
30. Sagittal arc	..	..	..	..	..
31. Frontal arc	117	..	122	130	127
32. Parietal arc	..	..	..	..	..
33. Frontal chord	..	..	..	..	..
34. Parietal chord	..	..	..	..	..
35. Occipital chord	..	..	..	..	..
36. Distance between Nasion and Glabella.	9	10	13	11	11
37. Bregma position line	..	..	..	..	..

TABLE I.

Naga Males.

Measurements.

27	35	46	1	2	6	9	11	12
..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	136
..	..	125	..	..	..	120	..	114
..	..	130·5	..	..	..	125	..	..
..	92	93	91	87·5	88	92	91	91
..	111	114	103	109	109	102	106·5	105
..	133	126	125	128	..	128	..	129
95	99	102	99	102	..	91	97	96
..	..	..	..	..	..	..	..	..
..	..	98	..	..	..	..	..	..
..	..	97	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..
61	66	62	62	66	71	58	62	67
46	51	52	47	47·5	50	46	46	49
26	24·5	27·5	27·5	28	..	29	27	26
21	22	22	19	18·5	..	20	20	18
36	36·5	37	39	40	..	37·5	38	37
33	35	34	34	33	..	33	37	34
..	103	103	96	94	..	99	102	..
..	96·5	94	92	90	..	91	94·5	..
..	100	98	96	96	..	97	..	..
59	65	64	62	64	..	59	..	61
43	52	50	51	53	..	45	..	47
39	46	41	41	41	..	38	..	30
34	41	33·5	38·5	36	..	36	..	36·5
..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..
..	..	295	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..
..	..	129	124	124	..	122	115	115
..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..
..	11·5	10·5	11	11	13	14	14	14
..	..	..	..	..	..	..	..	..

TABLE I.

Naga Males.

Measurements.

Skull No.	13	14	18	21	31
1. Max. cranial length	..	..	..	..	..
2. Max. cranial breadth	138	..	..	..	..
3. Auricular height	..	..	..	..	..
4. Basi-Bregmatic height	..	..	..	..	..
5. Least Front. breadth	99·5	92·5	101	96	102
6. Greatest Front. breadth	111	105	114·5	110	..
7. Max. Bizy. breadth	145	124(?)	131	128	..
8. Bimalar breadth	107	103	104	96	111
9. Bimostoid breadth	..	..	..	..	..
10. Nasion-Basion line	..	..	..	..	104
11. Prosth.-Basion line	..	..	..	..	96
12. Nasion-Inion length	..	..	..	..	..
13. Nasion-Prosth. line	70	..	71	54	64·5
14. Nasal length	53	52	50	47	48
15. Nasal breadth	26	27	28	30	25
16. Inter-orbital breadth	21	22	22	21	24
17. Orbital breadth	41	40	42	38	43
18. Orbital height	34	36	33	33	33
19. Bi-orbital breadth (outer)	108	104	110	106	110
20. Bi-orbital breadth (inner)	101	99	102	98	103
21. Bi-orbito Nasal arc	109	105	110	103	117
22. Maxil.-alv. breadth	66	66	74	56	65
23. Maxil.-alv. length	44	44(?)	55	44	50·5
24. Palatal length	37	35(?)	39	36·5	43
25. Palatal breadth	43	38	44	36	40
26. Length of Occ. foramen	..	..	..	..	..
27. Breadth of Occ. foramen	..	..	..	..	..
28. Horizontal circumference	..	..	..	..	..
29. Transv. cranial arc	..	..	..	105	132
30. Sagittal arc	..	..	..	..	..
31. Frontal arc	125	123	130	..	..
32. Parietal arc	..	..	..	..	..
33. Frontal chord	..	..	..	..	..
34. Parietal chord	..	..	..	..	..
35. Occipital chord	..	..	..	..	..
36. Distance between Nasion and Glabella.	12	16	8	10	11
37. Bregma position line	..	..	..	..	..

TABLE I.

Naga Males.

Measurements.

53	56	57	59	61	62	67	99	107
..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..
..	..	..	121	125	124	..	..	..
..	..	..	133	128	..	..	..	..
98	96	83	91	94	88	94·5	79	97
..	..	..	..	..	..	115	..	110
..	..	..	..	..	..	..	..	126
99	98	89	102	95	101	..	..	88·5
..	..	..	..	..	..	..	..	..
..	101	..	100	99	..	..	..	..
..	96	..	96	94	..	..	..	..
..	..	..	..	..	..	..	..	..
71	69	60	61	64	62	..	..	64
54	50	45·5	47	49	45	..	..	50
27	28·5	23	25	25	25	..	..	26·5
24	22	18	21	19	19	21	..	21
38	43	37	37	38	40	..	..	38
35	36	33	34	35	33	..	..	34
105	108	97·5	104	97·5	102	..	..	101
98	102	92	97	91	97	..	..	96
110	112	102	105	98	105	..	..	105
66	65·5	61	62	..	62·5	..	..	64
53	54	53	53·5	..	50	..	..	48
41	42	41	45	..	39	..	..	39
42	38	37	34	..	36	..	..	36
..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..
..	..	118	118	113	127	..	..	..
..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	123
..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..
10	10	10	11·5	11	9	..	..	7
..	..	..	..	..	..	..	..	..

TABLE I.

Naga Males.

Measurements.

Skull No.	113	111	112	116	123
1. Max. cranial length	..	..	..	..	..
2. Max. cranial breadth	..	..	..	..	..
3. Auricular height	121	..	..	..	..
4. Basi-Bregmatic height	124	..	..	..	..
5. Least Front. breadth	80	89	95	90	88
6. Greatest Front. breadth	103	..	111	105	..
7. Max. Bizy. breadth	125	120	134	..	..
8. Bimalar breadth	100	96	107	98	..
9. Bimastoid breadth	..	..	..	..	..
10. Nasion-Basion line	94	93	103	97	..
11. Prosth.-Basion line	90	98	103	..	..
12. Nasion-Inion length	..	..	..	..	..
13. Nasion-Prosth. line	65	58	67	56	63
14. Nasal length	50	50	51	45	49
15. Nasal breadth	25	24	27	26	31
16. Inter-orbital breadth	17	17	22	17	22
17. Orbital breadth	37·5	38	37	40	39
18. Orbital height	34	34	35	36	33
19. Bi-orbital breadth (outer)	97	101	106	99	102
20. Bi-orbital breadth (inner)	90	94·5	98	97	97
21. Bi-orbital Nasal arc	96	102	104	102	102
22. Maxil.-alv. breadth	59	64	60	..	64·5
23. Maxil-alv. length	51	57	51	..	50
24. Palatal length	39	43	48	..	..
25. Palatal breadth	36	35	34	..	..
26. Length of Occ. foramen	..	..	..	..	..
27. Breadth of Occ. foramen	..	..	..	..	..
28. Horizontal circumference	..	..	..	..	..
29. Transv. cranial arc	287	..	296	..	..
30. Sagittal arc	..	..	..	..	..
31. Frontal arc	123	..	130	..	118
32. Parietal arc	..	..	..	..	..
33. Frontal chord	..	..	..	..	..
34. Parietal chord	..	..	..	..	..
35. Occipital chord	..	..	..	..	..
36. Distance between Nasion and Glabella.	12	12	14	12	9
37. Bregma position line	..	..	..	..	..

TABLE I.

Naga Males.

Measurements.

163	169	178	180	190	194	189	182	186
..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..
123	..	..	..	..	..	..	128	..
..	..	..	..	..	..	..	132	132·5
98	88	96	91·5	98	..	94	97	88
..	104	109	..	116	..	113	124	104
135	..	126	..	134	128	142	133	129
99	90	103	98	110	97	111	91	104
..	..	..	..	..	..	..	..	..
..	..	..	..	..	102	..	95·5	98
..	..	..	..	..	98	..	88	93
..	..	..	..	..	..	..	..	..
67	60	66	61	67	67	73	60	72
50	50	51	48	54	52	57	52	54
28	27·5	28	25	29	26	31	28	24
22	20	20	17	21	19	21	21	17
40	38	38	39	39	39	41	39	40
36	33	32	35	35·5	34	36	32	37
109	97	101	102	103	..	109·5	105	103
103	93	96	98	97	..	99	99	95
108	104	104	103	104	..	107	108	100
65	63	62	..	63	64	70	64	66
57	50	54	..	46	50	51	50	58
45	42	43	42	41	40	43	41	45
39·5	36	35	32	37	39	41	37	39
..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..
290	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..
..	123	133	..	135	..	121	..	130
..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	118
..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..
14	8	10	9	11·5	8	12	13	15
..	..	..	..	..	..	..	..	..

TABLE I.

Naga Males.

Measurements.

Skull No.	171	172	175	177	179
1. Max. cranial length	..	..	190	178	..
2. Max. cranial breadth	..	131	141	127	136
3. Auricular height	130	123	127	119	128
4. Basi-Bregmatic height	136	134	..	..	133
5. Least Front. breadth	100	99	92	90	91·5
6. Greatest Front. breadth	115·5	112	110	107	115
7. Max. Bizy. breadth	142	138	130	130(?)	135
8. Bimalar breadth.	114	111	103	..	103
9. Bimastoid breadth	100	106	..	..	102
10. Nasion-Basion line	102	93	..	..	103
11. Prosth.-Basion line	99	94	..	..	100
12. Nasion-Inion length	..	..	187	175	..
13. Nasion-Prosth. line	70	71	69·5	70	70
14. Nasal length	55	51·5	54	52	57
15. Nasal breadth	27·5	25	27	28·5	27
16. Inter-orbital breadth	22	21	19	19	17
17. Orbital breadth	41	41	36·5	40	40
18. Orbital height	35·5	38	35	36	38
19. Bi-orbital breadth (outer)	111	114	102·5	..	93
20. Bi-orbital breadth (inner)	102	103	92	..	102
21. Bi-orbito Nasal arc	106	111	99	..	101
22. Maxil.-alv. breadth	68	65	65	66	62
23. Maxil.-alv. length	55	60	51·5	56	59
24. Palatal length	41·5	46	43	41·5	42
25. Palatal breadth	44	37	38	3)	35
26. Length of Occ. foramen	..	..	..	..	..
27. Breadth of Occ. foramen	..	..	..	..	..
28. Horizontal circumference	..	..	..	..	..
29. Transv. cranial arc	313	306	318	292	306
30. Sagittal arc	..	..	..	..	..
31. Frontal arc	131	125	139	121	129
32. Parietal arc	..	..	138	126	..
33. Frontal chord	112	109	121	107	113
34. Parietal chord	..	..	120	114	..
35. Occipital chord	..	..	..	..	..
36. Distance between Nasion and Glabella.	13	14	13	11·5	15
37. Bregma position line	..	..	..	..	..

TABLE II.

Indices.

Naga Males.

Skull No.	64	105	118	205	215
1. Length-Breadth Index . .	..	..	..	..	—
2. Breadth-Height Index . .	..	..	..	..	—
3. Trans. Fronto-parietal Index .	..	..	..	..	68·38
4. Fronto-parietal Index . .	..	..	..	..	103·33
5. Frontal Curvature Index . .	87·40	88·37	..	87·69	84·87
6. Parietal Curvature Index . .	..	..	..	..	..
7. Sup. Facial Index . . .	52·31	51·09	52·61	47·24	—
8. Index of Occ. Foramen . .	83·33	..	..	..	..
9. Zygomatico-Frontal Index . .	73·08	70·43	70·90	73·44	..
10. Inter-orbital Index . . .	19·59	16·81	18·18	20·69	18·39
11. Orbital Index	87·18	79·53	85·37	83·13	88·62
12. Bi-orbito Nasal Index . .	109·47	105·10	109·71	118·28	106·12
13. Nasal Index	51·96	54·72	49·09	48·04	57·45
14. Maxil.-alv. Index . . .	121·15	105·74	122·41	121·57	122·92
15. Palatal Index	101·43	87·08	96·44	89·47	97·30
16. Trans. Cranio Facial Index . .	..	..	..	..	..
17. Vert.-Cranio-Facial Index . .	51·52	..	..	..	..
18. Dental Index	..	..	..	..	..

TABLE II.

Indices.

Naga Males.

Skull No.	209	219	217	207	216
1. Length-Breadth Index . .	..	..	..	..	..
2. Breadth-Height Index . .	..	..	..	..	..
3. Trans. Fronto-parietal Index .	67·86	..	..	..	..
4. Fronto-parietal Index . .	103·20	..	..	..	..
5. Frontal Curvature Index . .	87·20	88·28	..	..	87·70
6. Parietal Curvature Index . .	..	..	..	..	..
7. Sup. Facial Index . . .	51·88	54·34	50·41	44·70	..
8. Index of Occ. Foramen . .	..	..	..	..	..
9. Zygomatico-Frontal Index . .	71·43	73·19	70·73	72·73	..
10. Inter-orbital Index . . .	16·42	21·24	19·19	21·15	20·0
11. Orbital Index	87·50	87·50	76·32	85·0	100·0
12. Bi-orbito Nasal Index . .	104·61	105·77	106·45	105·15	106·52
13. Nasal Index	54·0	58·82	48·0	52·0	56·82
14. Maxil.-alv. Index . . .	136·0	103·13	113·64	125·53	..
15. Palatal Index	105·41	87·23	76·09	97·22	..
16. Trans, Cranio Facial Index . .	95·00	..	..	..	..
17. Vert. Cranio-Facial Index . .	..	..	..	..	..
18. Dental Index	..	..	..	..	..

TABLE II.

Indices.

Naga Males.

44	47	39	54	58	60	63	103	15
..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..
..	..	..	59·84	50·96	52·99	52·99′	51·88	52·38
..	..	..	..	..	..	..	..	67·93
..	..	..	74·80	71·04	70·83	65·70	75·56	72·22
22·77	22·45	..	19·80	20·59	19·05	18·81	22·02	18·18
97·30	97·06	..	92·11	92·31	86·84	92·31	87·80	87·71
106·88	105·69	..	107·29	105·26	107·99	104·21	109·90	105·49
62·79	59·78	..	48·08	54·90	54·72	51·92	53 70	52·0
..	133·33	..	118·87	121·11	121·57	123·08	127·27	120
..	100·0	..	82·77	85·71	87·80	86·05	88·64	86·67
..	..	..	..	..	..	..	..	..
..	..	..	..	48·53	..	..	..	49·62
..	..	..	..	..	..	..	..	..

TABLE II.

Indices.

Naga Males.

Skull No.	27	35	46	1	2
1. Length-Breadth Index	..	..	..	..	..
2. Breadth-Height Index	..	..	..	..	..
3. Trans. Fronto-parietal Index	..	..	..	..	..
4. Fronto-parietal Index	..	..	..	..	..
5. Frontal Curvature Index	..	..	..	..	..
6. Parietal Curvature Index	..	..	..	..	..
7. Sup. Facial Index	..	49·62	49·21	49·60	51·56
8. Index of Occ. Foramen	..	..	..	..	..
9. Zygomatico-Frontal Index	..	69·17	73·81	72·80	68·36
10. Inter-orbital Index	..	21·36	21·36	19·79	19·68
11. Orbital Index	91·67	95·91	91·89	87·18	82·50
12. Bi-orbito Nasal Index	..	103·63	104·26	104·35	106·67
13. Nasal Index	56·52	48·04	52·88	58·51	58·95
14. Maxil.-alv. Index	137·20	125·00	128·00	121·57	120·75
15. Palatal Index	87·18	89·13	81·71	93·85	87·80
16. Trans. Cranio Facial Index	..	..	..	..	..
17. Vert.-Cranio-Facial Index	..	..	45·01	..	..
18. Dental Index	..	..	..	..	..

TABLE II.

Indices.

Naga Males.

6	9	11	12	13	14	18	21	31
..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..
..	..	..	66·91	72·10	..	..	..	..
..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..
..	45·31	..	51·94	48·61	..	54·20	42·19	46·74
..	..	..	..	..	..	..	..	..
..	71·88	..	70·54	68·62	74·59	77·10	75·00	73·91
..	20·20	19·61	..	19·44	21·15	20·00	19·81	21·82
..	88·01	97·37	91·89	82·93	90·00	78·57	86·84	76·74
..	106·59	..	..	107·92	106·06	107·84	105·10	113·59
..	63·04	58·70	53·06	49·06	51·92	56·00	63·83	52·08
..	128·88	..	129·79	150·00	150·00	134·55	127·27	128·72
..	94·74	..	121·66	116·22	108·57	112·82	98·65	93·02
..	..	..	94·85	105·07	..	..	..	..
..	46·40	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..

TABLE II.

Indices.

Naga Males.

Skull No.	53	56	57	59	61
1. Length-Breadth Index . .	..	..	..	..	..
2. Breadth-Height Index . .	..	..	..	..	..
3. Trans. Fronto-parietal Index .	..	..	..	..	..
4. Fronto-parietal Index . .	..	..	..	..	..
5. Frontal Curvature Index . .	..	..	..	..	..
6. Parietal Curvature Index . .	..	..	..	..	..
7. Sup. Facial Index . . .	..	71·11	69·17	74·59	75·81
8. Index of Occ. Foramen . .	..	51·11	50·00	50·00	51·61
9. Zygomatico-Frontal Index . .	..	..	..	..	..
10. Inter-orbital Index . . .	22·86	20·37	18·46	20·19	19·49
11. Orbital Index	92·11	83·72	89·19	91·89	92·11
12. Bi-orbito Nasal Index . .	112·24	109·80	110·87	108·25	107·69
13. Nasal Index	50·00	57·00	50·55	53·19	51·02
14. Maxil.-alv. Index . . .	124·53	121·29	115·09	117·92	..
15. Palatal Index	102·44	90·48	90·24	75·56	..
16. Trans. Cranio Facial Index . .	..	..	..	..	..
17. Vert.-Cranio-Facial Index . .	..	..	..	45·86	50·00
18. Dental Index	..	..	..	..	..

TABLE II.

Indices.

Naga Males.

62	67	99	107	113	111	112	116	123
..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..
68·22	..	..	50·79	52·00	48·33	50·00	..	..
48·06	..	..	..	..	..	..	..	..
..	..	..	76·98	64·00	74·17	70·90	..	..
18·63	..	..	20·79	17·53	16·83	20·75	17·17	21·57
82·50	..	..	89·47	90·68	87·47	94·59	90·00	84·62
108·25	..	..	109·38	106·67	107·94	106·12	105·15	105·15
55·56	..	..	53·00	50·00	48·00	52·94	57·78	63·27
125·00	..	..	133·33	115·69	112·28	117·65	..	129·00
92·31	..	..	92·31	92·31	81·40	70·83	..	..
..	..	..	..	..	..	..	..	..
..	..	..	..	52·42	..	51·54	46·26	..
..	..	..	..	..	..	..	..	..

TABLE II.

Indices.

Naga Males.

Skull No.	163	169	178	180	190
1. Length-Breadth Index . .	..	..	..	..	..
2. Breadth-Height Index . .	..	..	..	..	..
3. Trans. Fronto-parietal Index .	..	..	..	..	..
4. Fronto-parietal Index . .	..	..	..	..	..
5. Frontal Curvature Index . .	..	..	..	..	..
6. Parietal Curvature Index . .	..	..	..	..	..
7. Sup. Facial Index . . .	49·63	..	52·38	..	50·00
8. Index of Occ. Foramen . .	..	..	..	..	..
9. Zygomatico-Frontal Index . .	72·59	..	76·19	..	73·13
10. Inter-orbital Index . . .	20·18	20·62	18·69	16·67	20·39
11. Orbital Index	90·00	84·84	84·21	89·74	85·90
12. Bi-orbito Nasal Index . .	104·85	111·83	108·33	105·10	107·22
13. Nasal Index	56·00	55·00	54·90	52·08	53·70
14. Maxil.-alv. Index . . .	114·04	126·00	114·81	..	136·96
15. Palatal Index	87·78	85·71	81·40	76·19	90·24
16. Trans. Cranio Facial Index . .	..	..	..	..	..
17. Vert.-Cranio-Facial Index . .	..	..	..	..	..
18. Dental Index	..	..	..	..	..

TABLE II.

Indices.

Naga Males.

194	189	182	186	171	172	175	177	179
..	..	..	..	..	..	74·21	71·35	..
..	..	..	..	..	..	90·07	93·70	94·12
..	..	..	..	..	..	65·25	70·87	..
..	..	..	..	..	..	99·28	104·13	..
..	94·62	85·93	90·77	85·50	87·20	87·05	88·43	87·60
..	..	..	..	..	..	86·96	90·48	..
52·34	51·40	45·11	55·81	49·29	51·45	53·46	53·84	51·85
..	..	..	..	..	..	..	..	..
..	66·20	72·93	68·22	70·42	71·74	70·77	69·23	67·78
..	19·18	20·00	16·50	19·82	18·42	18·54	..	18·28
87·18	87·80	82·05	92·50	86·58	92·68	95·90	90·00	95·00
..	108·08	109·09	105·26	103·92	107·77	107·61	..	99·02
50·00	54·39	53·85	44·44	50·00	48·55	50·00	54·82	47·37
128·00	137·25	128·00	113·79	123·64	108·33	126·22	117·86	105·08
97·50	93·35	90·24	86·67	106·04	80·43	88·37	93·99	83·33
..	..	..	..	..	105·34	92·20	102·36	99·26
..	..	45·45	54·34	51·47	52·99	..	..	52·63
..	..	..	..	..	..	..	..	..

TABLE III.

Naga Females.

Measurements.

Skull No.	212	211	101	108
1. Max. cranial length	..	..	..	..
2. Max. cranial breadth	..	..	..	..
3. Auricular height	116	111·5	..	..
4. Basi-Bregmatic height	124	..	..	..
5. Least Front. breadth	84	90	89	84
6. Greatest Front. breadth	105	108	..	103
7. Max. Bizy. breadth	128	118	133·5	..
8. Bi-malar breadth	96	88	105	89
9. Bi-mastoid breadth	91·5	95	..	..
10. Nasion-Basion line	92	..	..	..
11. Prosth.-Basion line	..	..	..	..
12. Nasion-Inion length	..	..	..	..
13. Nasion-Prosth. line	..	58	61	69
14. Nasal length	46·5	45	50	50
15. Nasal breadth	28	24	27	24·5
16. Inter-orbital breadth	20	17·5	22·5	20
17. Orbital breadth	31	38	38·5	37
18. Orbital height	34	32·5	34	32
19. Bi-orbital breadth (outer)	95	94	103	94
20. Bi-orbital breadth (inner)	90	88	97	90
21. Bi-orbito Nasal arc	96	93	104	100
22. Maxil.-alv. breadth	62	60	60	63
23. Maxil.-alv. length	..	45	52	54
24. Palatal length	..	35	42	42
25. Palatal breadth	40	34	35	37·5
26. Length of Occ. foramen	..	..	..	..
27. Breadth of Occ. foramen	..	..	..	..
28. Horizontal circumference	..	..	..	..
29. Transv. cranial arc.	292	288	..	..
30. Sagittal arc.	..	..	..	..
31. Frontal arc.	119	125	..	..
32. Parietal arc.	..	..	..	..
33. Frontal chord	102	111	..	..
34. Parietal chord	..	..	..	..
35. Occipital chord	..	..	..	..
36. Distance between Nasion and Glabella.	11·5	12	11	10·5
37 Bregma position line	..	..	..	..

TABLE III.

Naga Females.

Measurements.

22	33	48	10	19	20	24	49
..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..
82	93	88	88	91	88	91	90
105	112	108	102	100	105	107	..
..	131	..	121	..	..	114	..
97	103	88	100	98 (?)	87	..	94
..	..	..	..	..	..	..	..
..	..	91	..	..	92	..	..
..	..	89·5	..	..	86·5	..	..
..	..	..	..	..	..	..	..
67	68	65	65	61	58	57	64
54	51	50	50	46	49	44	50
24	27	25·5	27	25·5	27	22	25
21	19	18	18	22	18·5	21	19
37	38	39	38	35	38	34	40
34	35	37	34	31	36	33	34
100	104	99·5	98	99	..	96	104
94	96	94	91	91	..	90·5	96
100	104	97	98	97	..	100	102
62	64	60	60	..	..	54	..
49	51	49	50·5	..	..	41	..
40	40·5	39	40	..	..	37	..
36	37	32	36	..	..	30	..
..	..	34	..	..	..	..	..
..	..	30	..	..	..	..	..
..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..
..	..	..	..	..	..	107	..
..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..
10	11	10	10	9	14	8	10
..	..	..	..	..	..	..	..

TABLE III.

Naga Females.

Measurements.

Skull No.	106	109	206	115
1. Max. cranial length	..	..	..	..
2. Max. cranial breadth	..	..	..	..
3. Auricular height	..	..	..	..
4. Basi-Bregmatic height	..	..	..	..
5. Least Front. breadth	81	86	83	97
6. Greatest Front. breadth	..	..	..	..
7. Max. Bizy. breadth	..	124	..	126
8. Bi-malar breadth	93	90	90	93
9. Bi-mastoid breadth	..	..	..	..
10. Nasion-Basion line	..	97	..	..
11. Prosth.-Basion line	..	93	..	..
12. Nasion-Inion length	..	..	..	..
13. Nasion-prosth. line	62	54	61·5	65
14. Nasal length	47	45	49	50
15. Nasal breadth	25	25	25	25
16. Inter-orbital breadth	19	20	16	21
17. Orbital breadth	38	36	36	35
18. Orbital height	34	33	35	33
19. Bi-orbital breadth (outer)	96·5	97	92	104
20. Bi-orbital breadth (inner)	92	91	86	97
21. Bi-orbito Nasal arc	100	97	..	105
22. Maxil-alv. breadth	63	56	62·5	64
23. Maxil.-alv. length	47·5	42	50 (?)	49
24. Palatal length	36	36	40	42
25. Palatal breadth	38	32	35	39
26. Length of Occ. foramen	..	..	..	..
27. Breadth of Occ. foramen	..	..	..	..
28. Horizontal circumference	..	..	..	..
29. Transv. cranial arc.	..	..	..	..
30. Sagittal arc.	..	..	..	..
31. Frontal arc.	..	..	..	..
32. Parietal arc.	..	..	..	..
33. Frontal chord	..	..	..	..
34. Parietal chord	..	..	..	..
35. Occipital chord	..	..	..	..
36. Distance between Nasion and Glabella.	10	12	..	13
37. Bregma position Line	..	..	..	..

TABLE III.

Naga Females.

Measurements.

119	173	181	164	167	170	174	176
..	..	..	..	..	174	183	171
..	..	..	..	..	139	128·5	134
..	124	..	115	123	123	117	123
..	132	..	125	..	..	..	..
88	91	91	89	88	94	93	90
..	110	107	106	107	113·5	109	107·5
132·5	..	122	121	125	119	..	113
92	..	90	94	97	..	90	87·5
..	97	..	..	..	101 (?)	..	104 (?)
..	..	..	88	..	..	..	..
..	..	..	92·5	..	..	..	..
..	..	..	..	..	163	179	163
72	63	59	63	68	..	66·5	61
51	50	44	46	51	..	52	47
27	..	27	24	25	..	24	23·5
22	20	19	19·5	18	21	20	17·5
38	38	37	35·5	37	..	40	38
35	37	32	30	33	..	35	34·3
104	..	99	101	98	99	100	94
97·5	..	94	92	90	89	95	90
104	..	100	96	96	96	103	97
67	..	59	57	63	..	..	59
54	..	44	52	50	..	..	50
45	..	39	42·5	46	..	..	37
40	..	36	35	35	..	..	34
..	35	..	..	..	..	..	..
..	31	..	..	..	..	..	..
..	..	..	..	..	..	..	..
..	292	..	278	295	315	294	307
..	..	..	..	..	..	..	..
..	..	121	119	132	134	125	124
..	..	..	..	..	120	126	123
..	..	..	105	108	115	108	109
..	..	..	..	..	109·5	111	108
..	..	..	..	..	..	..	..
11	10·5	9	12	12	12	11	10
..	..	..	..	.	..	..	..

TABLE IV.

Naga Females.

Indices.

Skull No.	212	211	101	108
1. Length-Breadth Index	..	..	..	..
2. Breadth-Height Index	..	..	..	..
3. Trans. Fronto-parietal Index	..	..	..	..
4. Fronto-parietal Index	..	..	..	..
5. Frontal Curvature Index	85·71	88·80	..	..
6. Parietal Curvature Index	..	..	..	..
7. Sup. Facial Index	..	49·15	45·70	..
8. Index of Occ. Foramen	..	..	..	..
9. Zygomatico-Frontal Index	65·63	76·27	66·67	..
10. Inter-orbital Index	21·05	18·89	21·84	21·28
11. Orbital Index	109·68	85·52	88·32	86·49
12. Bi-orbito Nasal Index	106·67	105·68	107·22	111·11
13. Nasal Index	60·22	53·33	54·00	49·00
14. Maxil.-alv. Index	..	133·33	115·38	116·67
15. Palatal Index	..	97·14	83·33	89·29
16. Trans. Cranio Facial Index	..	..	..	..
17. Vert. Cranio-Facial Index	..	..	..	..
18. Dental Index	..	..	..	..

TABLE IV.

Naga Females.

Indices.

22	33	48	10	19	20	24	49
..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..
..	51·91	..	53·72	..	..	50·00	..
..	..	88·24	..	..	..	..	..
..	70·99	..	72·73	..	..	79·82	..
21·00	18·27	18·09	18·37	22·22	..	21·88	18·27
91·88	92·11	94·87	89·47	88·57	94·74	97·06	85·00
106·38	108·33	103·19	107·69	106·59	..	110·55	106·25
44·44	52·94	51·00	54·00	55·43	55·10	50·00	50·00
126·53	125·49	122·45	118·82	..	..	131·70	..
90·00	91·37	82·05	90·00	..	..	81·08	..
..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..

TABLE IV.

Naga Females.

Indices.

Skull No.	106	109	206	115
1. Length-Breadth Index . . .	..	..	..	..
2. Breadth-Height Index . . .	..	..	..	..
3. Trans. Fronto-parietal Index .	..	..	..	..
4. Fronto-parietal Index . . .	..	..	..	..
5. Frontal Curvature Index . .	..	..	..	..
6. Parietal Curvature Index . .	..	..	..	..
7. Sup. Facial Index . . .	..	43·55	..	51·59
8. Index of Occ. Foramen . .	..	..	..	..
9. Zygomatico-Frontal Index . .	..	69·35	..	76·98
10. Inter-orbital Index . . .	19·69	20·41	17·39	20·19
11. Orbital Index	89·47	91·67	97·22	94·29
12 Bi-orbito Nasal Index . . .	108·70	106·59	105·81	108·25
13. Nasal Index	53·19	55·56	51·02	50·00
14. Maxil.-alv. Index	132·64	133·33	125·00	130·61
15. Palatal Index	105·56	88·89	87·50	92·86
16. Trans. Cranio Facial Index . .	..	..	..	..
17. Vert. Cranio-Facial Index . .	..	..	..	..
18 Dental Index	..	..	..	..

TABLE IV.

Naga Females.

Indices.

119	173	181	164	167	170	174	176
..	..	..	..	..	79·89	70·22	78·36
..	..	..	..	..	88·49	91·05	91·79
..	..	..	..	..	67·63	72·37	65·67
..	..	..	..	..	89·55	100·80	99·19
..	..	..	88·24	81·82	85·82	86·40	87·90
..	..	..	..	..	91·25	88·10	87·80
54·34	..	48·36	52·07	54·40	..	..	53·51
..	..	..	..	..	..	..	..
66·42	..	74·59	73·55	70·40	78·99	..	77·88
21·15	..	19·19	19·30	18·37	23·60	20·00	18·61
92·11	97·37	86·49	84·52	89·19	..	87·50	90·79
106·67	..	106·38	104·35	106·66	107·87	108·42	107·78
52·94	..	61·36	52·17	49·02	..	46·15	50·00
124·07	..	134·09	109·62	126·00	..	..	118·00
88·89	..	92·31	82·36	76·09	..	..	91·89
..	..	..	..	..	85·61	..	84·33
..	50·80	..	50·40	..	..	..	..
..	..	..	..	..	..	..	..

TABLE V.

Occipital pieces.

Measurements and indices.

Skull No.	Occipital chord.	Occipital arc.	Biasterionic diameter.	Occipital curvature index.
N. 165	98	122	111	80·33
N. 34	95	112	118	84·82
N. 95	99	130	111	76·15
N. 83	90	104	120	86·75
N. 82	99	118	105	83·90
N. 4	104	130	102	80·00
N. 196	94	127	105·5	74·02
N. 80	..	108	95	..
N. 168	..	120	106·5	..
N. 159	..	122	112	..
N. 28	..	107	103	..
N. 94	..	110	100	..
N. 23	..	119	114	..
N. 26	..	104	100	..
N. 184	..	127	123	..
N. 81	..	108	98	..
N. 5	..	112	..	..
N. 120	..	115	121	..
N. 77	..	107	102	..
N. 96	..	123	124	..
N. 36	..	115	104	..
N. 75	..	114	103·5	..
N. 93	..	120	106	..
N. 37	..	115	119	..
N. 26	..	..	106	..
N. 65	..	..	112	..
N. 78	..	..	109	..
N. 17	107	..	..	..
N. 69	115	..	..	..
N. 187	105	..	..	..
N. 90	108	..	..	..
N. 40	106	..	..	..
N. 102	107	..	..	..
N. 170	..	..	..	..

TABLE VI.

Naga Males.

Statistical Constants.

Measurement.	n	Mean.	S. D.	Coeff. of var.
1. Max. cranial length	2	184∓0·96	2·05∓0·67	1·11∓0·37
2. Max. cranial breadth	8	135·6∓1·03	4·33∓0·72	3·18∓0·52
3. Auriculo-bregmatic height	24	122·9∓0·57	4·25∓0·41	3·45∓0·33
4. Basilo-bregmatic height	17	130·9∓0·74	4·49∓0·52	3·42∓0·38
5. Least frontal breadth	59	92·8∓0·43	4·85∓0·30	5·21∓0·30
6. Greatest frontal breadth	50	110∓0·46	4·87∓0·33	4·42∓0·29
7. Bizygomatic breadth	46	130·5∓0·56	5·71∓0·40	4·35∓0·30
8. Bimastoid breadth	4	103·2∓0·81	2·38∓0·57	2·31∓0·54
9. Nasion-basion line	20	99·7∓0·59	4·00∓0·42	4·01∓0·42
10. Prosthion-basion line	22	96·4∓0·80	5·59∓0·57	5·82∓0·59
11. Nasion-inion length	2	181∓2·88	6·00∓2·02	3·31∓1·10
12. Nasion-prosthion line	57	65·3∓0·43	4·81∓0·30	7·40∓0·47
13. Nasal length	58	50·2∓0·27	3·12∓0·19	6·24∓0·39
14. Nasal breadth	57	26·9∓0·16	1·77∓0·11	6·55∓0·41
15. Interorbital breadth	58	20·2∓0·16	1·92∓0·12	9·60∓0·59
16. Orbital breadth	57	38·8∓0·16	1·82∓0·11	4·65∓0·29
17. Orbital height	57	34·4∓0·14	1·63∓0·10	4·79∓0·30
18. Outer bi-orbital breadth	53	103·2∓0·43	4·71∓0·30	4·57∓0·29
19. Inner bi-orbital breadth	53	96·6∓0·36	3·89∓0·25	4·02∓0·26
20. Bi-orbitonasal arc	52	103·5∓0·46	5·00∓0·33	4·85∓0·32
21. Maxillo-alveolar breadth	51	63·9∓0·31	3·33∓0·22	5·20∓0·35
22. Maxillo-alveolar length	51	51·8∓0·43	4·58∓0·31	8·81∓0·59
23. Palatal length	51	41·1∓0·33	3·53∓0·23	8·61∓0·58
24. Palatal breadth	51	37·4∓0·25	2·74∓0·18	7·40∓0·50
25. Occipital foramen—				
(*a*) length	2	38∓0·48	1·00∓0·33	2·63∓0·88
(*b*) breadth	2	28·2∓0·86	1·75∓0·60	6·25∓2·09
26. Bimalar breadth	54	100·2∓0·56	6·12∓0·39	6·11∓0·39
27. Transverse cranial arc	21	298·4∓1·71	11·69∓1·21	3·92∓0·69
28. Frontal arc	43	124·9∓0·66	6·53∓0·47	5·22∓0·38
29. Parietal arc	5	127·8∓0·17	0·56∓0·11	·43∓0·09
30. Frontal chord	15	112∓0·91	5·29∓0·65	4·72∓0·57
31. Parietal chord	4	113·9∓1·43	4·25∓1·02	3·72∓0·91
32. Distance between Nasion and Glabella.	58	11·5∓0·17	1·96∓0·12	17·81∓1·26

n=number; S. D.=Standard Deviation; Max.=maximum; Coeff. of var.=Co-efficient of variation; Trans.=Transverse; Sup.=Superior.

TABLE VI.

Naga Males.

Statistical Constants.

Indices.	n	Mean.	S. D.	Coeff. of var.
1. Length-breadth index .	2	72·8∓0·67	1·43∓0·47	1·96∓0·66
2. Breadth-height index .	3	92·7∓0·71	1·82∓0·50	1·95∓0·55
3. Trans. Fronto-parietal index.	4	80·2∓4·58	13·59∓3·27	16·98∓4·17
4. Fronto-parietal index .	4	101·7∓0·69	2·04∓0·49	2·00∓0·48
5. Frontal curvature index .	15	87·9∓0·38	2·24∓0·27	2·54∓0·31
6. Parietal curvature index .	4	88·1∓0·47	1·47∓0·34	1·60∓0·57
7. Index of the Occipital foramen.	2	75·6∓3·70	7·70∓2·59	10·13∓3·41
8. Sup. facial index . .	45	50·4∓0·30	3·03∓0·21	6·01∓0·42
9. Zygomatico-frontal index.	45	71·7∓0·27	2·71∓0·19	3·62∓0·26
10. Interorbital index . .	53	20∓0·15	1·63∓0·11	8·15∓0·53
11. Orbital index . . .	57	87∓0·47	5·32∓0·34	6·11∓0·38
12. Bi-orbitonasal index .	52	107·1∓0·27	2·91∓0·19	2·72∓0·18
13. Nasal index . . .	57	53·7∓0·38	4·29∓0·27	7·94∓0·51
14. Maxillo-alveolar index .	51	123·7∓0·91	9·65∓0·64	7·78∓0·52
15. Palatal index . . .	51	91·6∓0·95	10·06∓0·67	10·93∓0·73
16. Transverse cranio-facial index.	7	99·1∓1·27	4·89∓0·89	4·94∓0·88
17. Vertical cranio-facial index	15	49·6∓0·52	3·02∓0·37	6·09∓0·74

TABLE VII.

Naga Females.

Statistical Constants.

Measurement.	n	Mean.	S. D.	Coeff. of var.
1. Max. cranial length	3	176∓2·01	5·09∓1·42	2·89∓0·81
2. Max. cranial breadth	3	133·8∓1·15	2·88∓0·81	2·14∓0·59
3. Auriculo-bregmatic height	8	119·1∓1·35	4·34∓0·72	3·64∓0·61
4. Basilo-bregmatic height	3	127∓1·42	3·55∓1·01	2·79∓0·74
5. Least frontal breadth	24	88·7∓0·52	3·82∓0·37	4·29∓0·54
6. Greatest frontal breadth	17	106·8∓0·56	3·36∓0·39	3·14∓0·36
7. Bizygomatic breadth	14	123·4∓1·09	6·0∓0·76	4·87∓0·61
8. Bimastoid breadth	5	97·7∓1·38	4·50∓0·94	4·59∓0·90
9. Nasion-basion line	5	92∓0·89	2·89∓0·61	3·14∓0·66
10. Prosthion-basion line	4	90·4∓0·87	2·59∓0·62	2·87∓0·67
11. Nasion-inion length	3	168·3∓3·01	7·54∓2·13	4·48∓1·21
12. Nasion-prosthion line	22	63·1∓0·61	4·27∓0·44	6·77∓0·81
13. Nasal length	23	48·6∓0·38	2·68∓0·26	5·47∓0·54
14. Nasal breadth	22	25·3∓0·21	1·50∓0·15	5·92 ∓0·61
15. Interorbital breadth	24	19·7∓0·23	1·65∓0·16	8·25∓0·81
16. Orbital breadth	23	37·1∓0·27	1·97∓0·19	5·32∓0·54
17. Orbital height	23	33·8∓0·23	1·66∓0·16	4·88∓0·48
18. Outer bi-orbital breadth	22	98·7∓0·51	3·60∓0·36	3·63∓0·37
19. Inner bi-orbital breadth	22	92·1∓0·44	3·10∓0·31	3·36∓0·34
20. Bi-orbitonasal arc	21	99·3∓0·48	3·30∓0·34	3·33∓0·34
21. Maxillo-alveolar breadth	18	60·9∓0·47	3·08∓0·34	5·05∓0·56
22. Maxillo-alveolar length	17	48·8∓0·60	3·70∓0·43	7·55∓0·88
23. Palatal length	17	40∓0·49	3·00∓0·34	7·50∓0·88
24. Palatal breadth	18	35·6∓0·43	2·67∓0·30	7·41∓0·81
25. Occipital foramen—				
(*a*) length	2	34·5∓0·23	·50∓0·16	1·47∓0·49
(*b*) breadth	2	30·5∓0·23	·50∓0·16	1·66∓0·56
26. Bimalar breadth	21	93·4∓0·73	5·0∓0·51	5·37∓0·55
27. Transverse cranial arc	8	295·1∓2·41	10·0∓1·68	3·42∓0·57
28. Frontal arc	9	122·9∓1·68	7·47∓1·20	6·07∓0·94
29. Parietal arc	3	123∓0·43	1·14∓0·31	0·92∓0·27
30. Frontal chord	7	108·3∓1·01	3·86∓0·71	3·57∓0·65
31. Parietal chord	3	109·5∓0·51	1·28∓0·36	1·17∓0·32
32. Distance between Nasion and Glabella.	23	10·8∓0·18	1·30∓0·12	1·20∓0·11

TABLE VII.

Naga Females.

Statistical Constants.

Indices.	n	Mean.	S. D.	Coeff. of var.
1. Length-breadth index .	3	76·1∓1·74	4·36∓1·23	5·73∓1·62
2. Breadth-height index .	3	90·4∓0·43	1·14∓0·31	1·26∓0·35
3. Trans. Fronto-parietal index.	3	68·6∓0·99	2·51∓0·70	3·63∓1·04
4. Fronto-parietal index .	3	96·5∓1·90	4·80∓1·34	4·94∓1·39
5. Frontal curvature index .	7	86·4∓0·57	2·17∓0·40	2·52∓0·46
6. Parietal curvature index .	3	89∓0·55	1·41∓0·39	1·58∓0·44
7. Index of the Occipital foramen.	1	88·24	..	..
8. Sup. facial index . .	12	50·7∓0·61	3·23∓0·44	6·33∓1·08
9. Zygomatico-frontal index .	14	71∓0·91	5·03∓0·63	7·08∓0·88
10. Interorbital index . .	22	20∓0·30	2·08∓0·21	10·4∓1·08
11. Orbital index . . .	23	91·5∓0·76	5·44∓0·53	5·97∓0·59
12. Bi-orbitonasal index .	22	107·1∓0·25	1·80∓0·18	1·68∓0·17
13. Nasal index . . .	22	52·3∓0·54	3·84∓0·38	7·46∓0·74
14. Maxillo-alveolar index .	17	124·9∓1·18	7·18∓0·83	5·74∓0·67
15. Palatal index . . .	17	88·9∓1·02	6·23∓0·72	7·00∓0·81
16. Transverse craniofacial index.	2	85∓0·48	1·00∓0·33	1·17∓0·39
17. Vertical craniofacial index	2	50·6∓0·09	0·20∓0·06	0·39∓0·13

TABLE VIII.

Occipital pieces.

Statistical Constants.

Measurements and Indices.	n.	Mean.	S. D.	Coeff. of var.
1. Occipital chord . .	13	102∓0·44	6·65∓0·31	6·52∓0·30
2. Occipital arc . . .	24	116·54∓1·05	7·68∓0·77	6·57∓0·67
3. Biasterionic diameter .	26	108∓1·05	7·96∓0·74	7·37∓0·69
4. Occipital curvature index .	7	80·81∓1·14	4·42∓0·80	5·45∓0·94

TABLE IX.

Additional measurements, angles, etc.

Skull No.	N. 170	N. 174.	N. 175.	N. 176.	N. 177.	N. 209.
1. The Calvarial base (Nasion inion line).	158	178	..	161	178	..
2. Nasion lambda line .	170	172	185	168	174	174
3. Frontal chord . .	111	105	122	111	106	110
4. Parietal chord . .	117	113	121	122	121	115
5. Calvarial height . .	103	109	..	100	95	..
6. Brigma position line .	97	85	..	93	89	..
7. Frontal perpendicular .	31	27	31	28	23	27
8. Parietal perpendicular .	26	28	29	29	25	22
9. Frontal inclination angle	61°	52°	..	59°	57°	..
10. Occipital inclination angle	93°	77°	..	94°	84°	..
11. Facial Profile angle .	..	86°	85°	81°	83°	81°
12. Calvarial base angle .	6°	10°	..	7°	8°	..
13. Nasion to foot of Bregma perpendicular.	54	61	..	56	58	..
14. Inion to foot of Auditory perpendicular.	66	..	..	..	..	..
15. Bregma position index .	34·17	34·27	..	34·78	32·58	..
16. Calvarial height index .	65·19	61·23	..	62·11	53·37	..
17. External Auditory meatus position index.	41·77	..	..	..	..	..

TABLE X.

An approximate estimation of the cranial capacities from the average measurements of the Trans. sulci.

Skull No.	Average measurement.		Calculated Cranial Capacity.
4	21·6	=	1499∓69·0 c.c.
5	18·2	=	1403∓69·0 c.c.
17	17·6	=	1387∓69·0 c.c.
23	18·4	=	1409∓69·0 c.c.
26	15·8	=	1336∓69·0 c.c.
29	15·6	=	1330∓69·0 c.c.
32	21·2	=	1487∓69·0 c.c.
34	18·4	=	1409∓69·0 c.c.
35	24·0	=	1566∓69·0 c.c.
36	17·6	=	1387∓69·0 c.c.
37	18·4	=	1409∓69·0 c.c.
38	11·4	=	1213∓69·0 c.c.
40	19·0	=	1435∓69·0 c.c.
65	18·2	=	1403∓69·0 c.c.
68	16·0	=	1342∓69·0 c.c.
69	16·6	=	1359∓69·0 c.c.
70	16·4	=	1353∓69·0 c.c.
71	23·4	=	1549∓69·0 c.c.
74	13·0	=	1258∓69·0 c.c.
75	16·8	=	1364∓69·0 c.c.
76	14·2	=	1292∓69·0 c.c.
77	14·8	=	1308∓69·0 c.c.
78	17·4	=	1381∓69·0 c.c.
80	14·4	=	1297∓69·0 c.c.
81	18·2	=	1403∓69·0 c.c.
82	18·0	=	1398∓69·0 c.c.
85	15·6	=	1330∓69·0 c.c.
86	18·8	=	1420∓69·0 c.c.
87	19·4	=	1447∓69·0 c.c.
88	14·4	=	1297∓69·0 c.c.
90	16·2	=	1347∓69·0 c.c.
93	11·4	=	1213∓69·0 c.c.
94	14·0	=	1286∓69·0 c.c.
95	14·8	=	1308∓69 c.c.
96	19·0	=	1426∓69 c.c.
120	20·0	=	1454∓69 c.c.
143	10·0	=	1174∓69 c.c.
149	15·4	=	1325∓69 c.c.
155	15·0	=	1314∓69 c.c.
165	14·0	=	1286∓69·0 c.c.
184	16·4	=	1353∓69·0 c.c.
187	13·4	=	1269∓69·0 c.c.

TABLE XI.

Group I.

Showing Facial measurements in an antero-posterior plane.

No. of Skulls.	A.	B.	C.	D.	E.	F.	G.	H.	I.	J.
N. 12 . .	79	..	68	77·5	..	77	82	88	67	..
N.175 . .	94	..	71	91	..	84	90	95·5	69	..
N. 177 .	88	..	72	87	..	88	91	96	73	..
N. 179 .	93	96	75	90	94	87	95	99	73	16·5
Mean . .	88·5	96	71·5	86·4	94	84	89·5	94·6	70·5	16·5

A = Preauricular length.
B = Basinasal length.
C = Projection of lateral orbital margin in front of midauricular plane.
D = Projection of Nasion.
E = Projection of ascending nasal process of maxilla.
F = Projection of lateral nasal margin.
G = Projection of subnasal point.
H = Projection of upper alveolar point.
I = Projection of malo-maxillary point.
J = Projection of Nose.

TABLE XII.

Group I.

Naga skulls.

Showing Projections of the cheek bones.

Skull No.	A.	B.	C.	D.	E.	F.
N. 12 . .	75	71	75	68	46	21
N. 175 . .	83	74	82	69	40	20
N. 177 . .	82	74	83	74	48	26
N. 179 . .	82	78	83·5	75	46	26
Mean . .	80·5	74·2	80·9	71·5	45	23·2

A = the radial distance of the anterior end of the frontomalar suture from the transmeatal axis.

B = the same from the midpoint on the lateral margin of the orbit.

C = the same from a point on the lower margin of the orbit crossed by the malo-maxillary sutur.

D = the same from the malo-maxillary point.

E = the distance between the malo-maxillary point to the nearest point on the lower margin of the orbit.

F = the distance from the lower malo-maxillary point to the anterior frontomalar point.

TABLE XIII.

Group II.

Showing facial measurements in an antero-posterior plane (for explanation see Table XII).

No. of Skulls.	A.	B.	C.	D.	E.	F.	G.	H.	I.	J.
N. 64 . .	90	..	73	85·5	..	85	89	93	73	..
N. 182 .	103	104	74	92	100	87·5	93	95	69	25
N. 209 .	93	..	75	87	..	84	88·5	95	72	..
N. 217 .	89	..	67	84	..	85	86	94·5	69·5	..
Mean . .	93·8	104	72·3	87·1	100	85·3	89·1	94·4	70·9	25

TABLE XIV.

Group II.

Naga skulls.

Showing projections of the cheek bones (for explanation see Table XII).

Skull No.	A.	B.	C.	D.	E.	F.
N. 64 . .	84	78	83	73	43	21
N. 182 . .	82	76	82	71	40	21
N. 209 . .	82	77	83	73	44	23·5
N. 217 . .	76	71	83	71	38	21·5
Mean . .	81	75·5	82·6	72	41·2	21·6

TABLE XV.

Measurements and Indices of the Naga skulls in the collection of the Indian Museum.

Collection Mark.	NH. 1.	NH. 2.	N. 493.
Sex.	♀	♂	♂
Max. cranial length	164	190	178
„ „ breadth	135	138	132
Auricular height	120	127	131
Basibregmatic height	123	..	138
Least frontal breadth	83·5	92	91
Greatest frontal breadth	99	108	113(?)
Interorbital breadth	..	27	18
Max. occipital breadth	97	111	103
Orbital height	..	..	31
Orbital breadth	..	..	40
Nasal length	..	..	48
Nasal breadth	..	..	27
Bimalar breadth	..	..	91
Bizygomatic breadth	..	..	124
Maxillo-alveolar breadth	..	..	57(?)
Maxillo-alveolar length	..	..	52
Palatal length	..	..	40
Palatal breadth	..	..	36
Length of Occ. foramen	35	..	36
Breadth of Occ. foramen	30	..	29
Nasion Prosthion line	..	..	65
Nasion Basion line	..	..	98·5
Nasion Gnathion line	..	..	94
Brosthion Basion line	..	..	94
Sagittal arc	..	364	372
Transverse arc	296	308	321
Horizontal circumference	468	..	498
Biorbital breadth (inner)	..	..	95

TABLE XV.

Measurements and Indices of the Naga skulls in the collection of the Indian Museum.

Collection Mark.	NH. 1.	NH. 2.	N. 493.
Sex.	♀	♂	♂
Biorbital breadth (outer)	..	..	102
Orbitonasal arc	..	..	101
Frontal arc	109 (from glabella)	125	122
Parietal arc	116	126	132
Occipital arc	102	113	118
Frontal chord	..	..	108
Parietal chord	..	..	118
Occipital chord	..	..	103
Bigonial breadth	..	..	80
Bicondylar breadth	..	..	180
Height of ramus	..	..	59
Minimum breadth of ramus	..	..	33
Symphyseal height	..	..	22
Mandibular angle	..	..	112°
„ length	..	..	72
Distance between Glabella to centre of Ext. Aud. meatus.	106·5	..	..
Distance between Inion to centre of Ext. Aud. meatus.	94	..	..
Length Breadth index	82·31	72·63	77·64
Length Height index	75·00	..	81·17
Length Auricular height index	73·17	66·84	77·05
Breadth Height index	91·11	..	104·54
Index of the Occ. foramen	85·71	..	80·55
Total facial index	..	..	75·80
Sup. facial index	..	..	52·41
Zygomaticofrontal index	..	..	73·38
Orbital index	..	..	77·77

TABLE XV.

Measurements and Indices of the Naga skulls in the collection of the Indian Museum.

Collection Mark.	NH. 1.	NH. 2.	N. 493.
Sex.	♀	♂	♂
Nasal index	..	..	56·25
Maxillo-alveolar index	..	..	109·61
Palatal index	..	..	[90·00
Mandibular inder	..	..	[66·66
Long. ocraniofacial index	..	..	55·29
Trans. craniofacial index	..	..	[93·93
Vert. craniofacial index	..	..	[47·10

TABLE XVI.

Melanesian skulls.

Showing facial measurements in an antero-posterior plane (for explanation see Table XI).

No. of Skulls.	A	B	C	D	E	F	G	H	I
L I. F. 2. .	106	115	76	96	110	101	110	112	77
L I. F. 3 .	111	116	79	104	111	98	106	108	75
L II. F. 1 .	96	106	72	91	98	92	101	105	75
L II. F. 2 .	97	105	76	91	100	96	106	113	73
Mean .	102·5	110·5	75·7	95·5	104·7	96·7	105·7	109·5	75·0

TABLE XVII.

MELANESIAN SKULLS.

Projections of the cheek (for explanation see Table XII).

No. of Skulls.	A	B	C	D	E	F
L I. F. 2 .	85	78	..	79	49	29·5
L I. F. 3 .	87	81	..	77	49	30
L II. F. 1 .	82	73	..	75	45	20
L II. F. 2 .	82	77	..	77	50	31·5
Mean . .	84·0	77·2	..	77·0	48·2	27·7

TABLE XVIII.

TASMANIAN SKULLS.

Showing facial measurements in an antero-posterior plane (for explanation see Table XI).

Skull No.	A	B	C	D	E	F	G	H	I	J
1 A . .	87	88	63	84	84	83	93	97	63	20
12 A . .	98	110	75	94	105	95	98	103	73	23
13 A . .	91	89	71	85	93	91	96	96	63	16
18 A . .	94	92	68	86	90	89	96	99	68	20
19 A . .	95	91	71	88	87	86	91	93	67	17
25 A . .	98	105	71	93	101	98	107·5	113	73	23
29 A . .	97	97	71	87	95	93·5	101	103	68	19
32 A . .	97	89	67	88	87	90	92	97	67	16
34 A . .	88	84	65	80	82	83	87	91	67	17
38 A . .	92	87	66	86	85	86	92	93	69	19
43 A . .	99	97	73	92·5	94	92	98·5	108	73	20
46 A . .	95	92·5	67	87	90	87·5	96	99	65	19
Mean . .	94·2	93·4	69·0	87·5	91·1	89·5	95·7	99·3	68·0	19·1

TABLE XIX.

Tasmanian skulls.

Showing projections of cheek bones (for explanation see Table XII).

No. of Skull.	A	B	C	D	E	F
1 A . .	72	65	74	64	44·5	21
12 A . .	81	77	86	75	44	28
13 A . .	84	73	82	64	46	25
18 A . .	78	70	79	78	41	22·5
19 A . .	81	72	80	69	44	23
25 A . .	83	74	84	74	50	26
29 A . .	79	74	83	68	44	27
32 A . .	78	69	78·5	68	38	20
34 A . .	75	67	75	68	40	20
38 A . .	76	68	77	70	39	20
43 A . .	85	75	82	74	49	22
46 A . .	73	69	78	65	39	22
Mean . .	78·7	71·1	79·9	69·7	43·2	23·0

APPENDIX A.

List of Smaller bones

9 pieces of Fibula.

2 lower ends of Humerus.

7 pieces of Radius.

1 piece of Ulna.

2 Metacarpal bones.

1 right maxilla.

143 a rectangular portion containing the occipital protuberance and parts of the transverse sulci.

144 a portion of the occipital region—being trangular in shape.

149 a triangular portion of the occipital bone; the cut is a little below the occipital protuberance.

155 portion of the right half of the occipital bone, chopped on all sides.

161 Occipital bone in which a portion of the left lower portion has been cut off.

72 right side of the vault—there is one vertical cut, and another horizontal along the base.

16 a quadrilateral piece of the vault.

41 a portion of vault—the cuts are—

(1) behind the coronal suture.

(2) along the base.

(3) on both the sides.

Portions of the vault, rectangular or subrectangular cut off generally on all sides :—

Nos. 126, 127, 128, 131, 132, 133, 130, 154, 150, 152, 151, 148, 162, 157, 146, 159.

142 Portions of the vault containing parts of the two parietals—the cuts are so disposed that they are placed at a distance of about 4″ above, whereas they meet with one another below.

139 Portion of the right temporal in which the anterior and outer portions have been cut off.

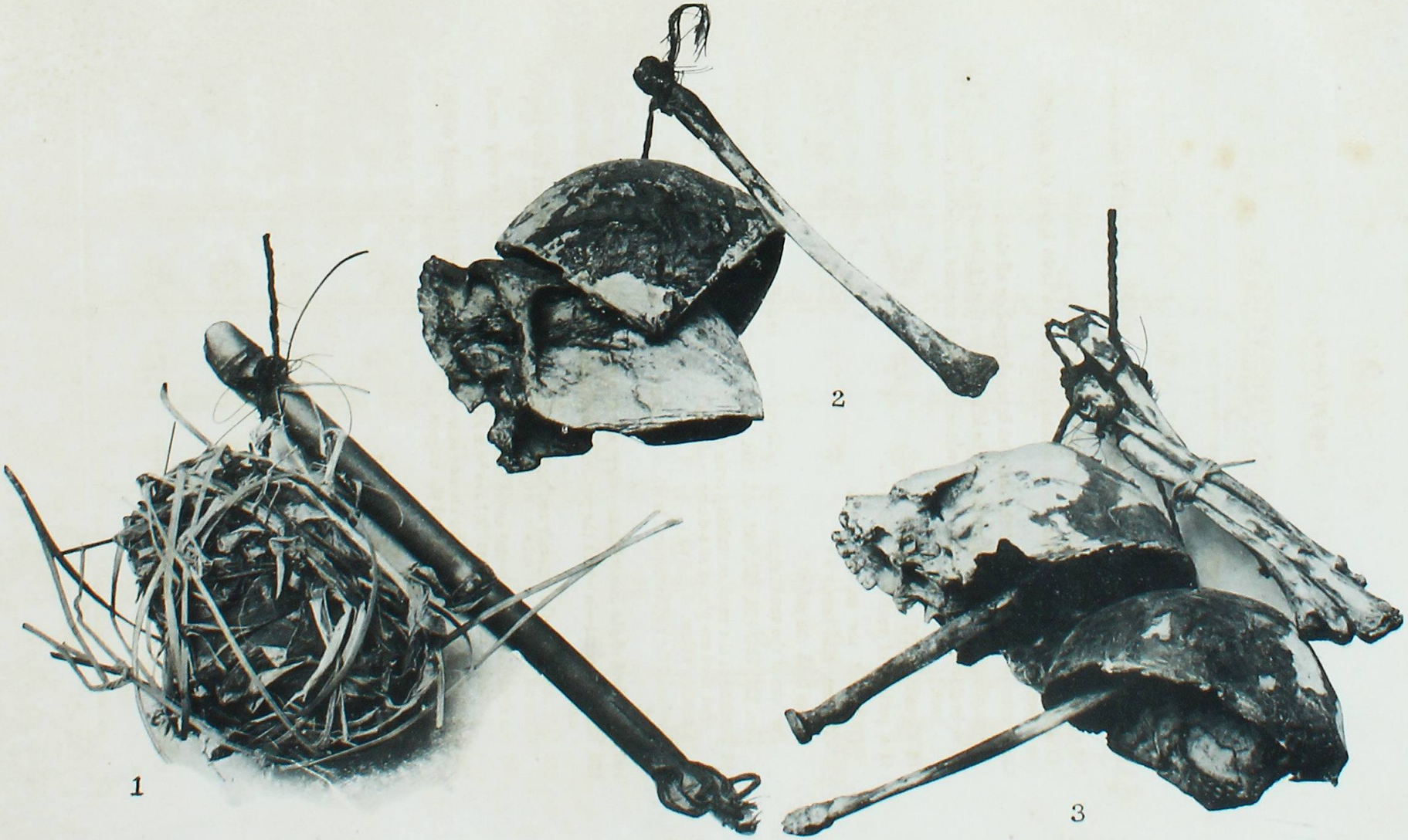
160 Right half of the frontal bone—there are two cuts—(1) Sagittal and (2) coronal.

156 Right temporal—in which the posterior part including the mastoid process has been cut off.

158 Left temporal—the anterior and outer portion as well as the lower part have been cut off.

7 the right half of the frontal and sphenoid and the right zygomatic and a very small portion of the right maxilla have been left.

192 a portion of the vault—there are two cuts—one, just in front of the coronal suture and the other a little behind the bregma.



S. C. Mondal, Photo.

The Skulls of Sacrificial Victims Suspended in Naga Homes.

EXPLANATION OF PLATE II.

Fig. 1 = N 170.
„ 2 = N 170.
„ 3 = N 174.
„ 4 = N 174.
„ 5 = N 174.

Scale $\frac{5}{13}$ of actual size.

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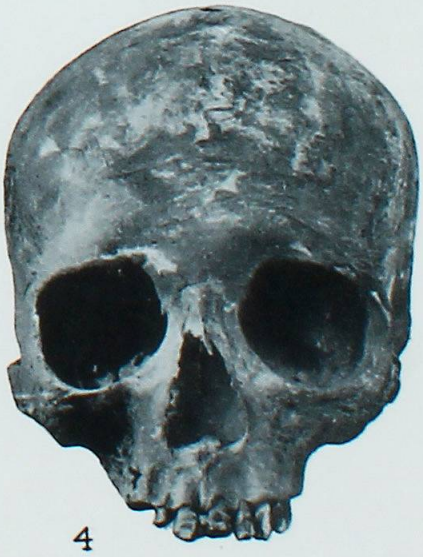
2

3



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S. C. Mondal. Photo

Naga Skulls.

EXPLANATION OF PLATE III.

Fig. 1 = N 175.
„ 2 = N 175.
„ 3 = N 175.
„ 4 = N 176.
„ 5 = N 176.
„ 6 = N 176.

Scale $\frac{5}{18}$ of actual size.

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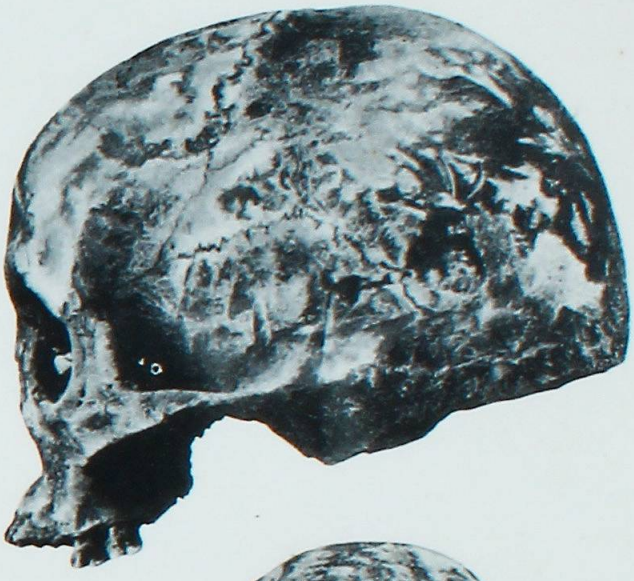

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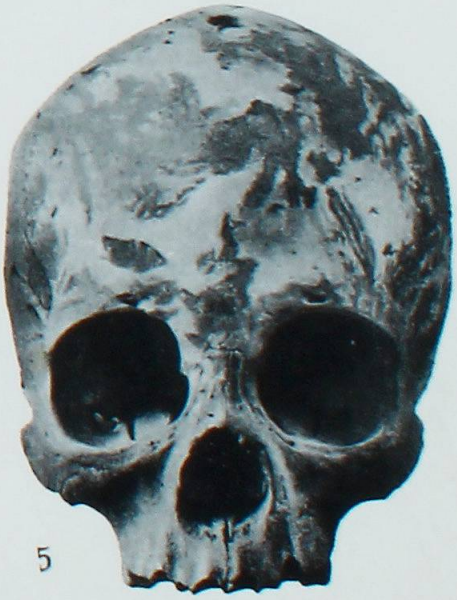

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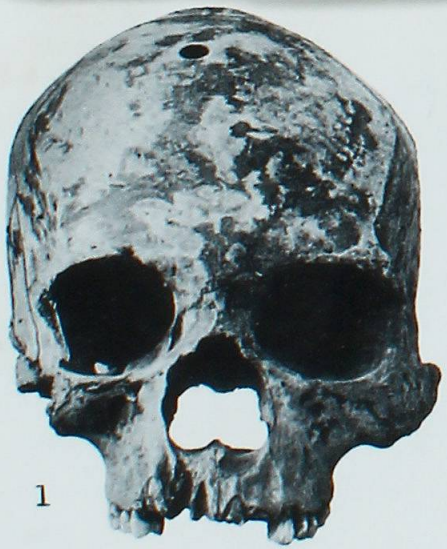
S. C. Mondal Photo.

Naga Skulls.

EXPLANATION OF PLATE IV.

Fig. 1 = N 177.
„ 2 = N 177.
„ 3 = N 177.
„ 4 = N 19.
„ 5 = N 4.
„ 6 = N 196.
„ 7 = N 95.

Scale $\frac{5}{13}$ of actual size.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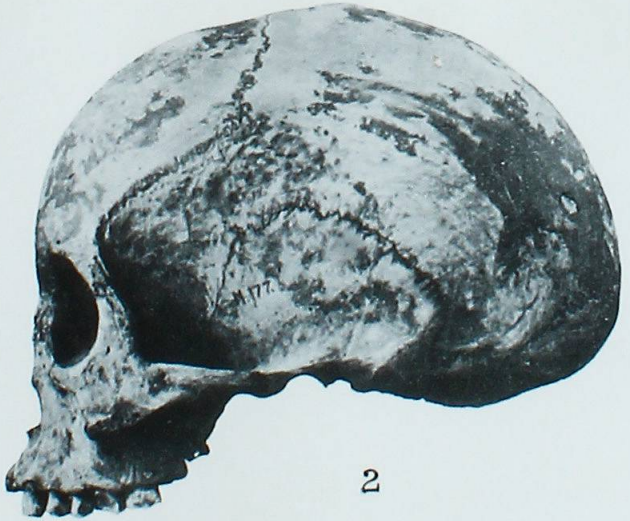
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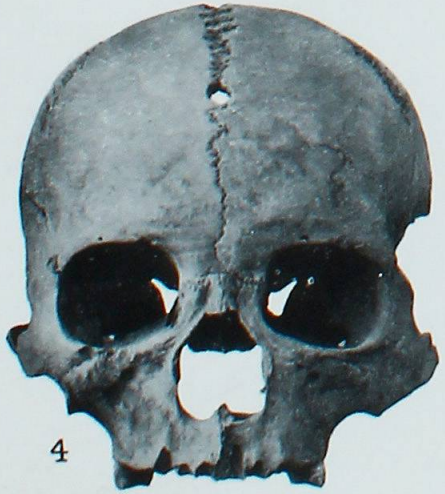
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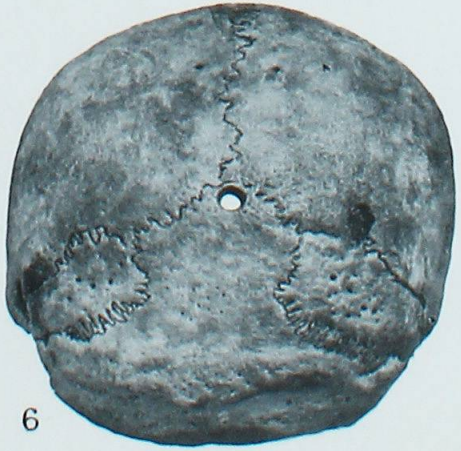
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7

S. C. Mondal, Photo.

Naga Skulls.

EXPLANATION OF PLATE V.

Fig. 1 = N 167.
„ 2 = N 167.
„ 3 = N 104.
„ 4 = N 15.

Scale Figs. 1 and 2 : $\frac{5}{13}$ of actual size.
Figs. 3 and 4 : actual size.

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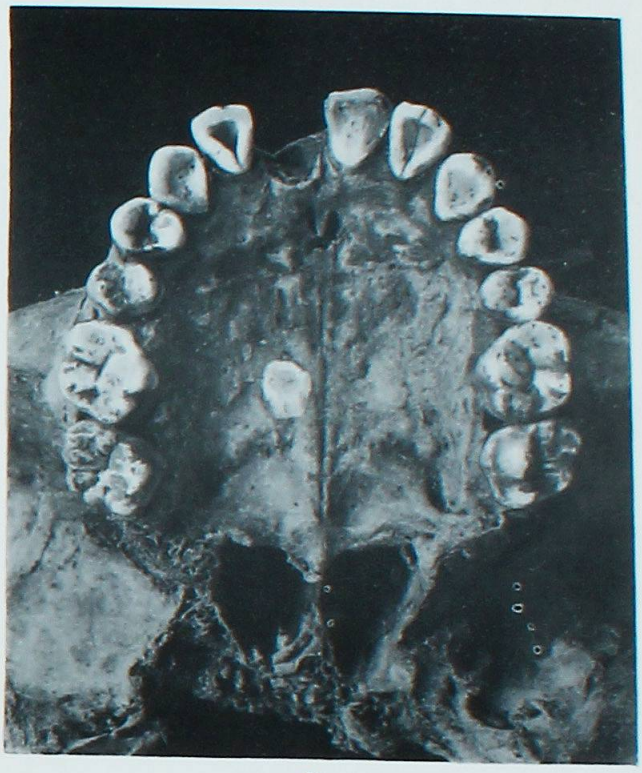

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S. C. Mondal, Photo.

Naga Skulls.

EXPLANATION OF PLATE VI.

Fig. 1 = N 105.
„ 2 = N 105.
„ 3 = N 118.
„ 4 = N 118.
„ 5 = N 182.
„ 6 = N 182.

Scale $\frac{5}{13}$ of actual size.

MGIPC—M—III-8-13—21-7-31—530.

1

2

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S. C. Mondal, Photo.

Naga Skulls.

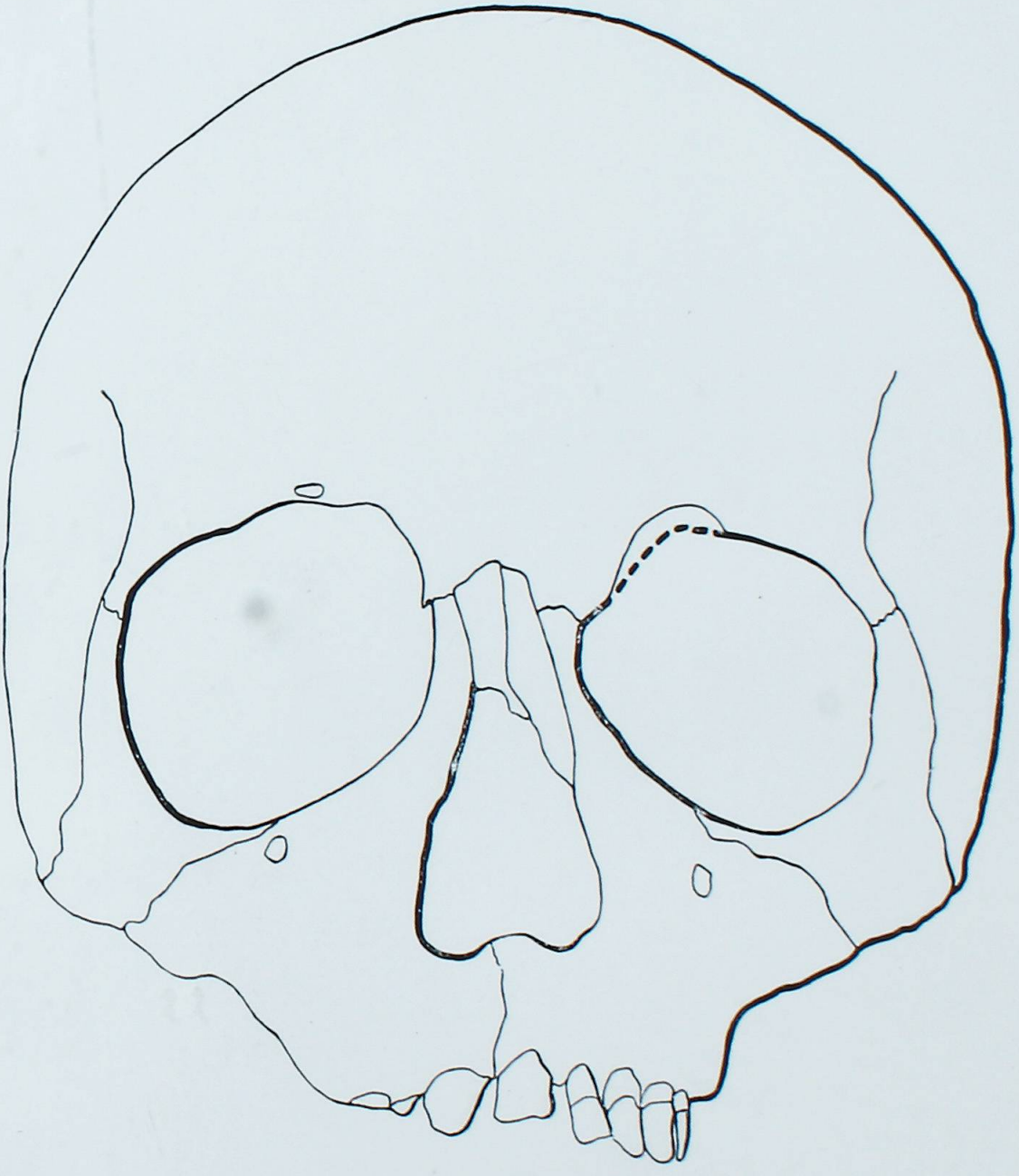
Dioptographic Tracings Norma Lateralis
N 170.

Norma Lateralis
N 174.

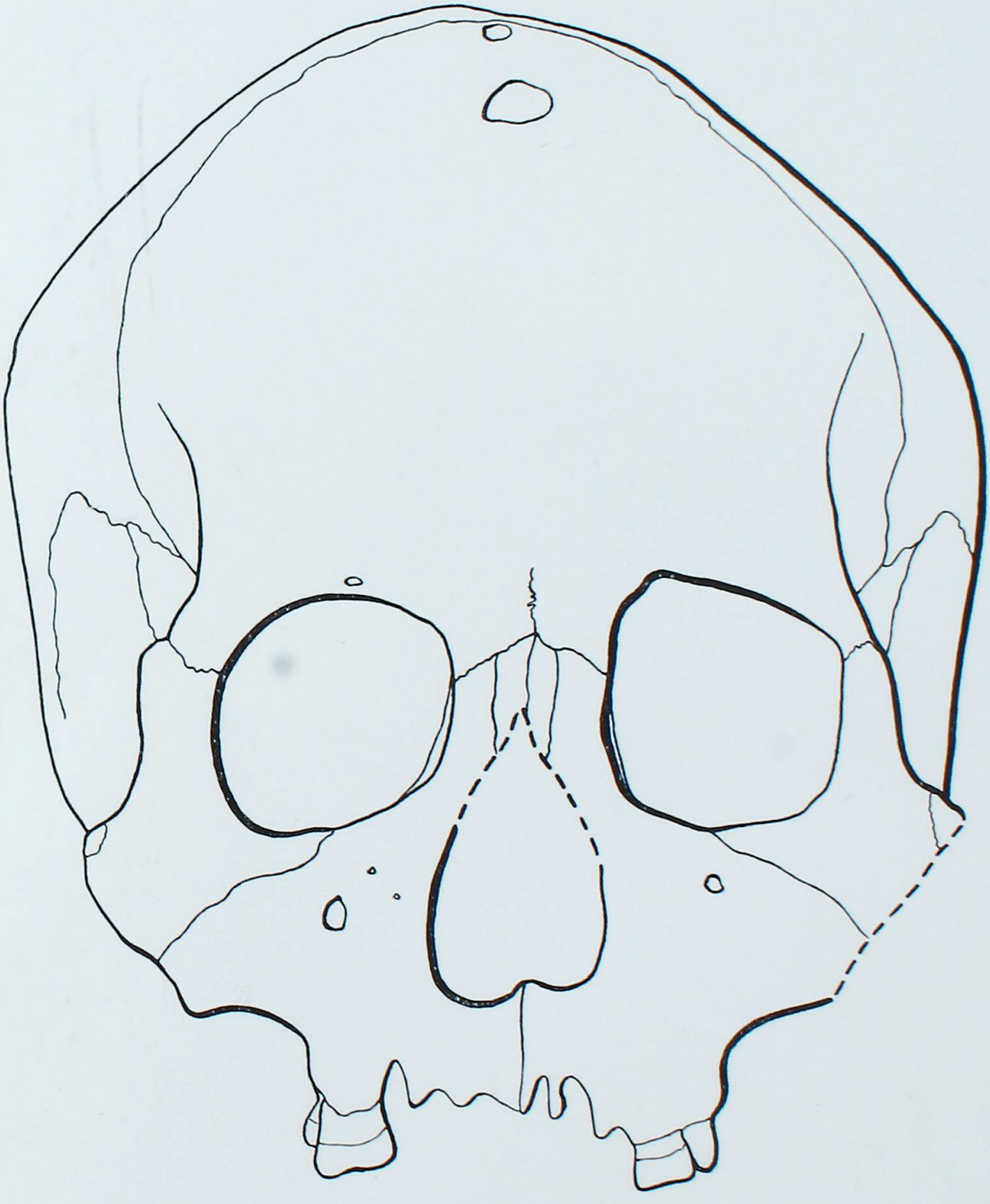
Norma Lateralis
N 175.

Norma Lateralis
N 176.

Norma Lateralis
N 177.



Norma Frontalis
N 174.



Norma Frontalis
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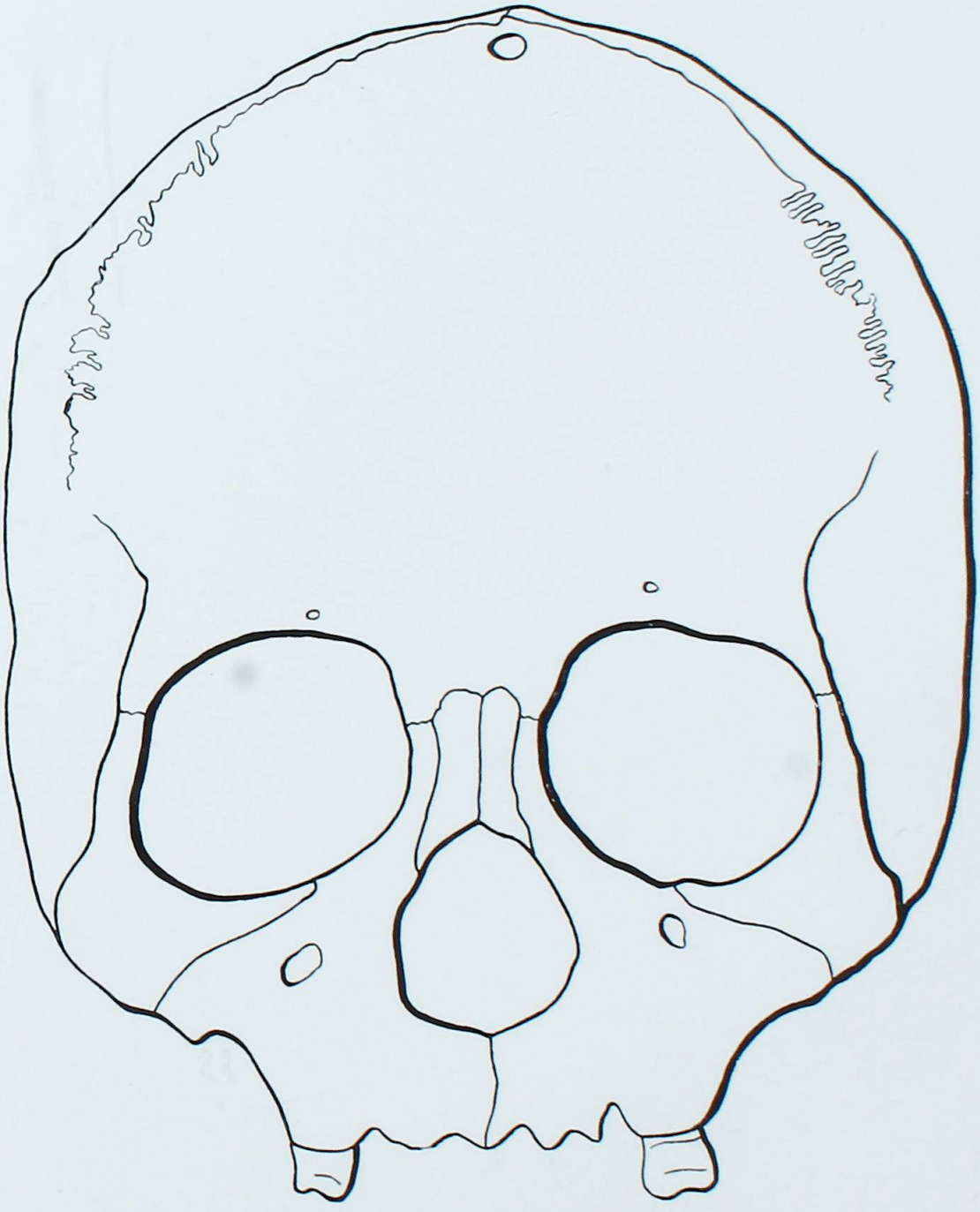

Norma Frontalis
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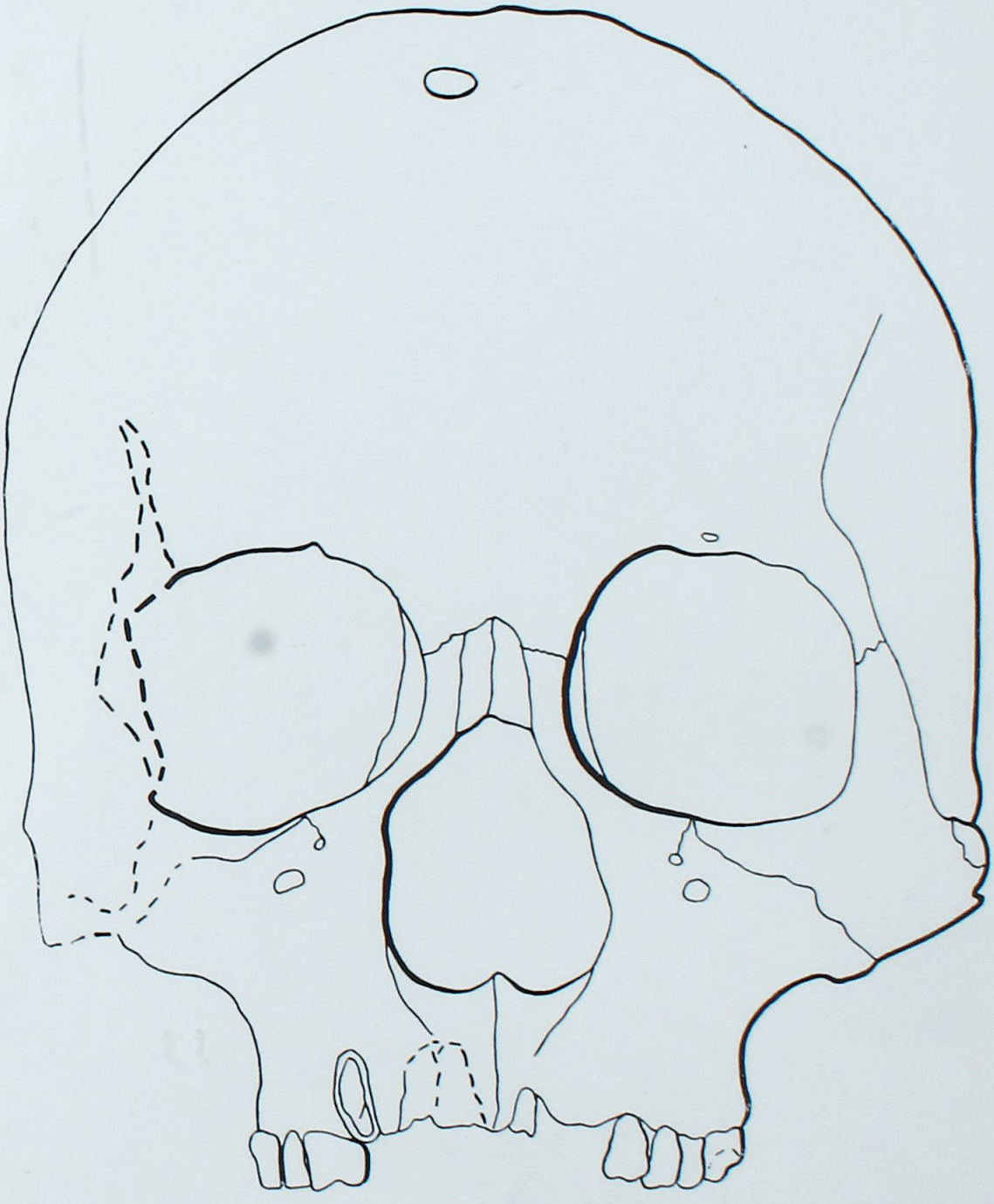
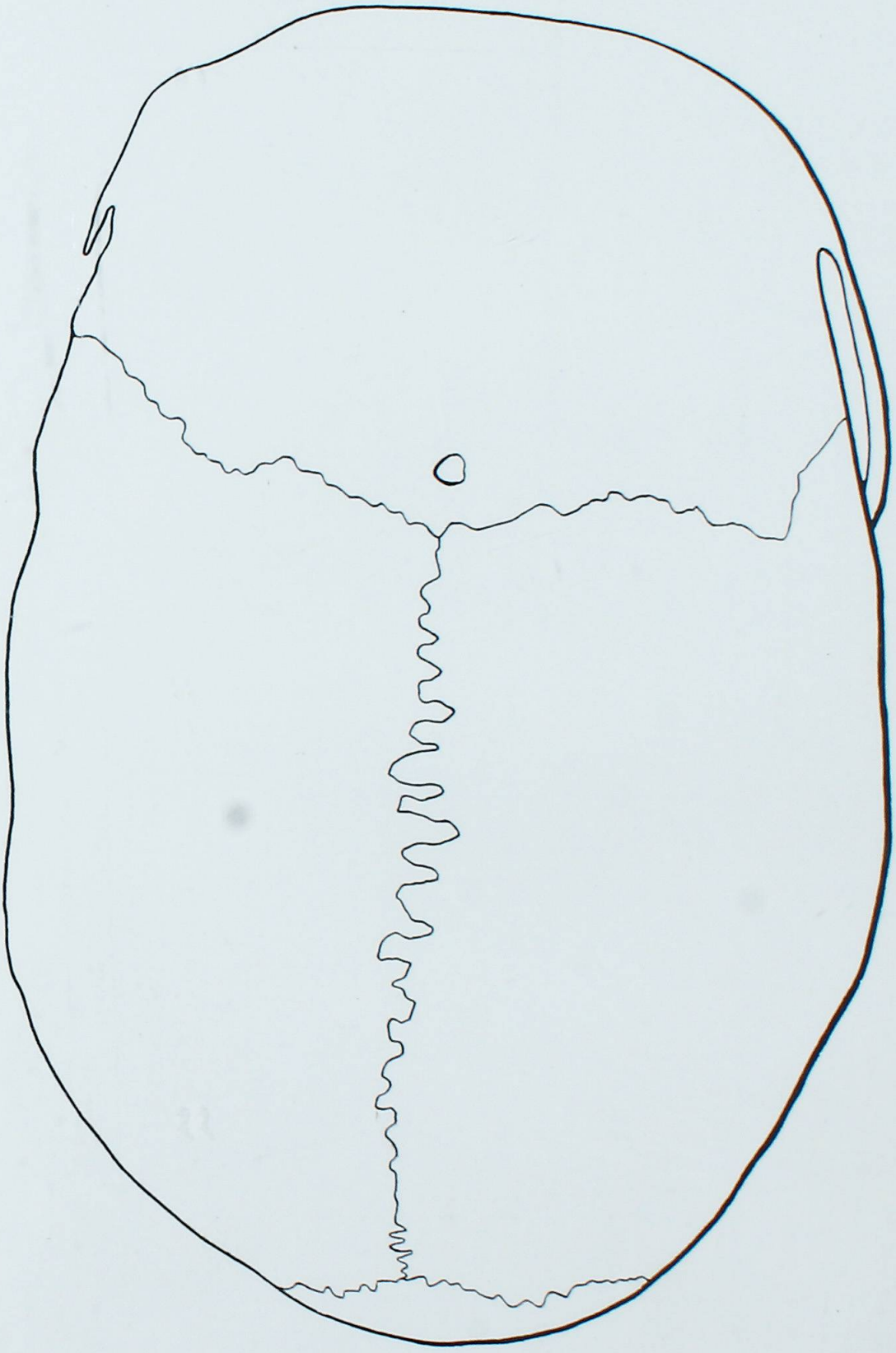


Norma Frontalis
N 177.

Norma Verticalis
N 170.



Norma Verticalis
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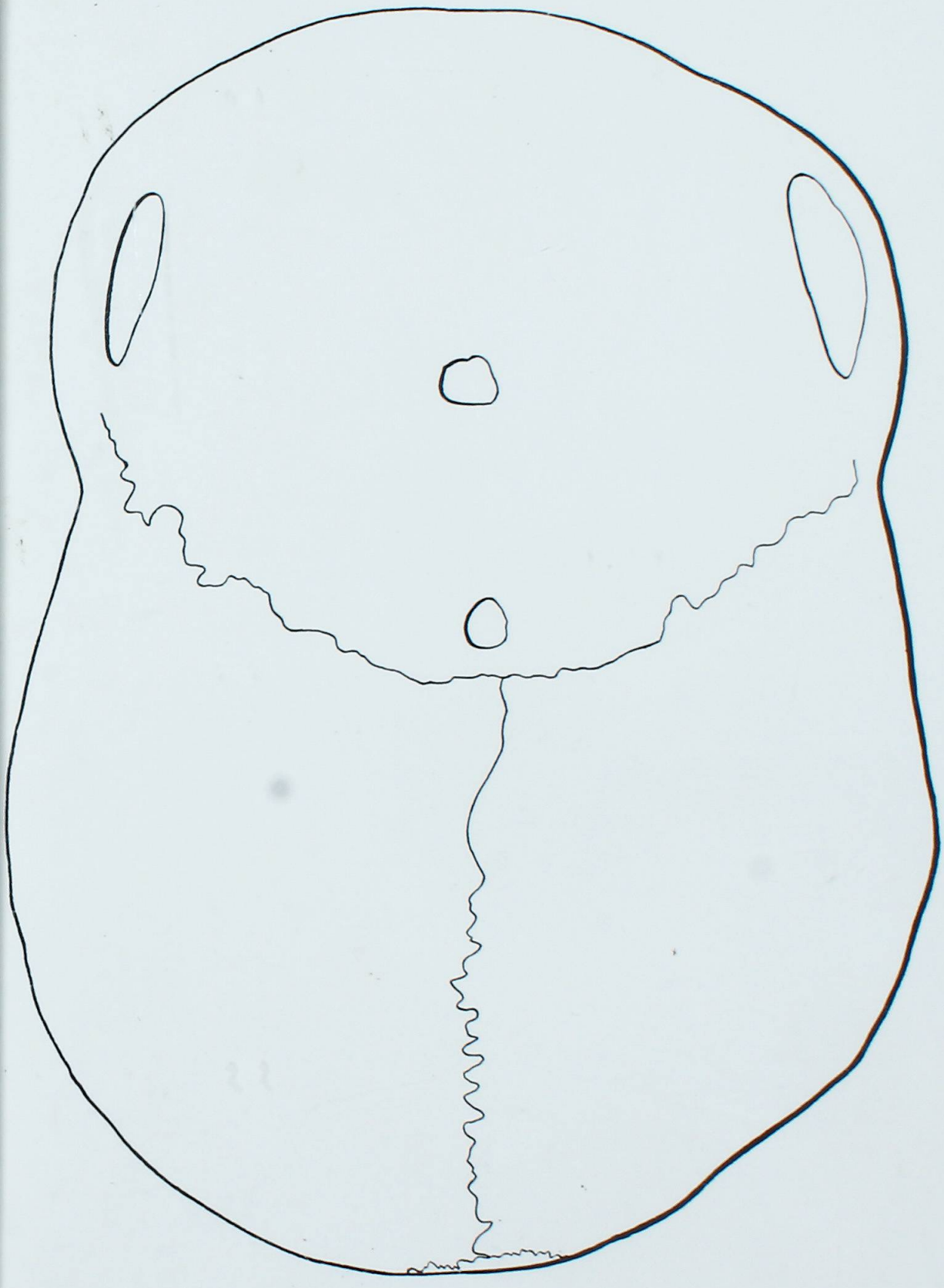

Norma Verticalis
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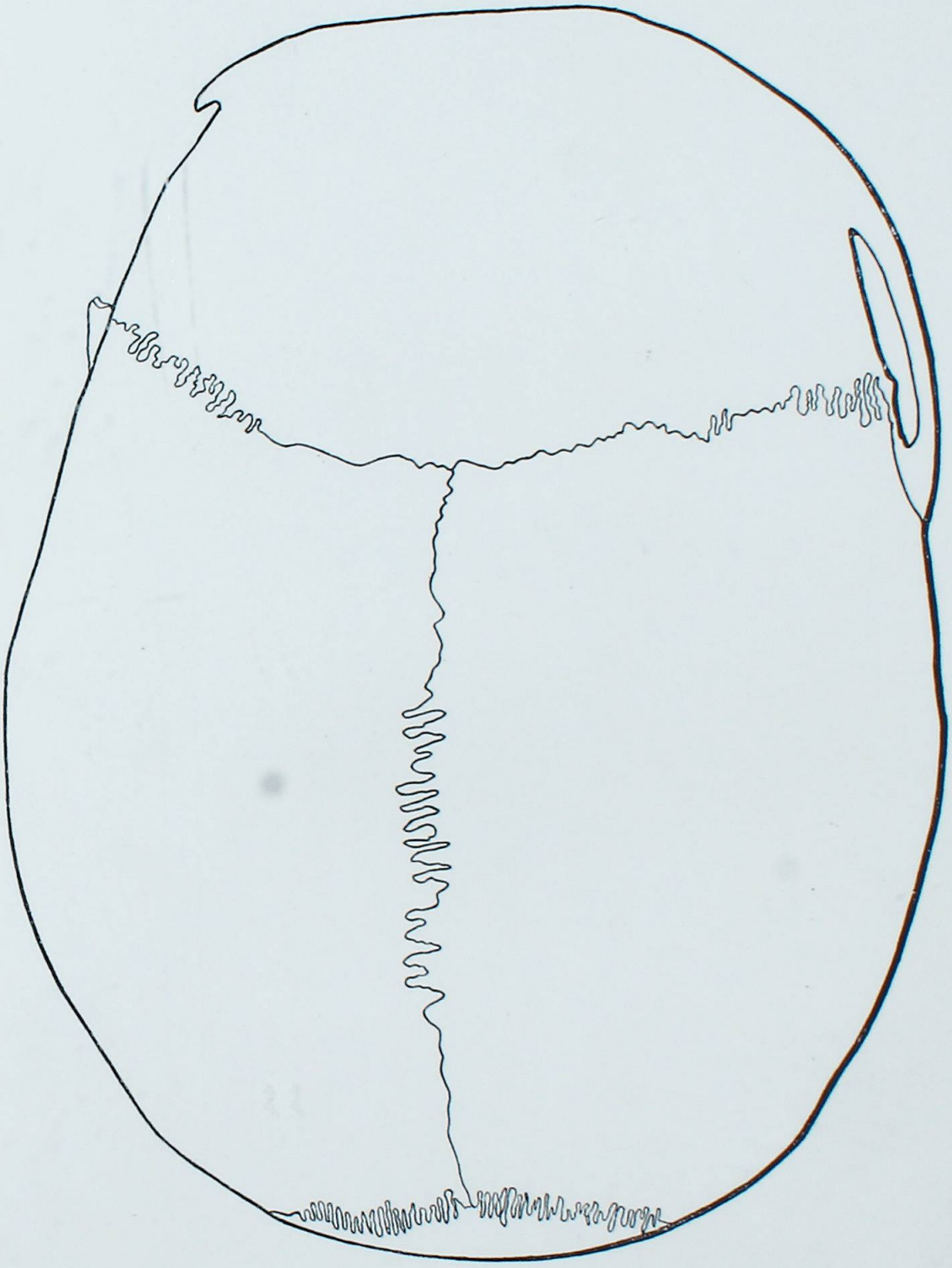

Norma Verticalis
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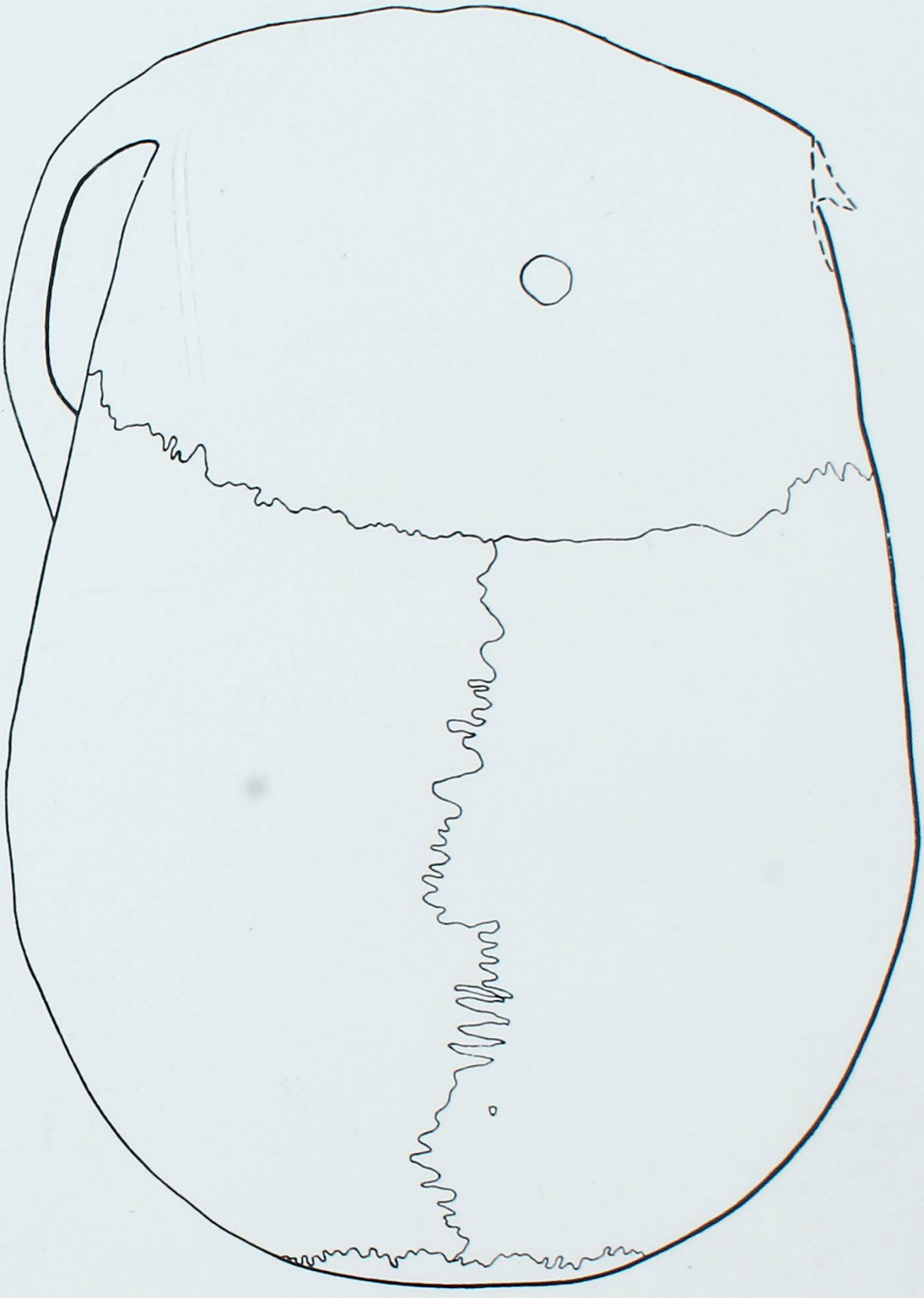

Norma Verticalis
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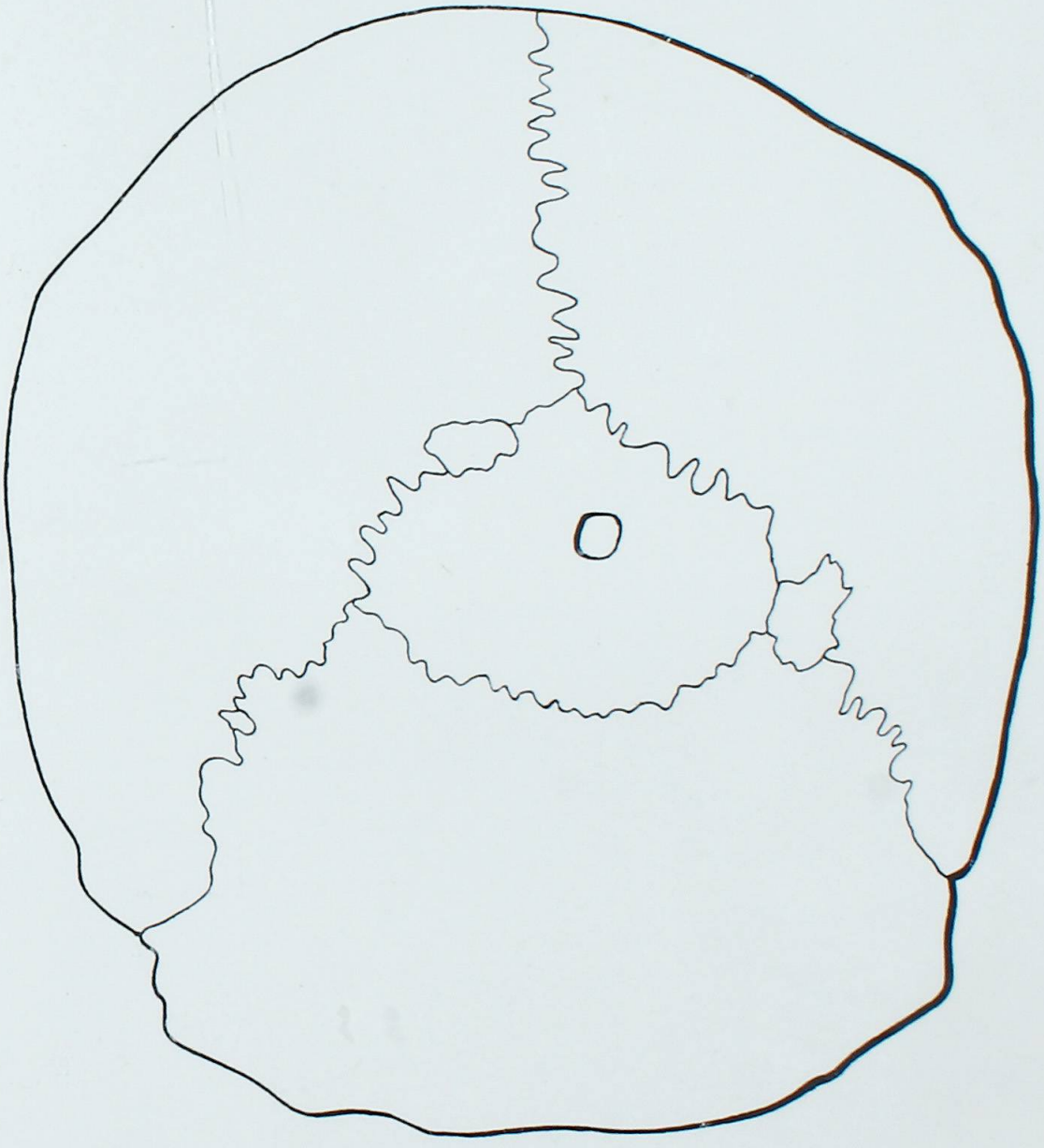

Norma Occipitalis
N 4.