

THE NON-METRICAL MORPHOLOGICAL CHARACTERS OF THE SKULL AS CRITERIA FOR RACIAL DIAGNOSIS

PART III

THE NON-METRICAL MORPHOLOGICAL CHARACTERS OF THE SKULLS OF PREHISTORIC INHABITANTS OF GUAM

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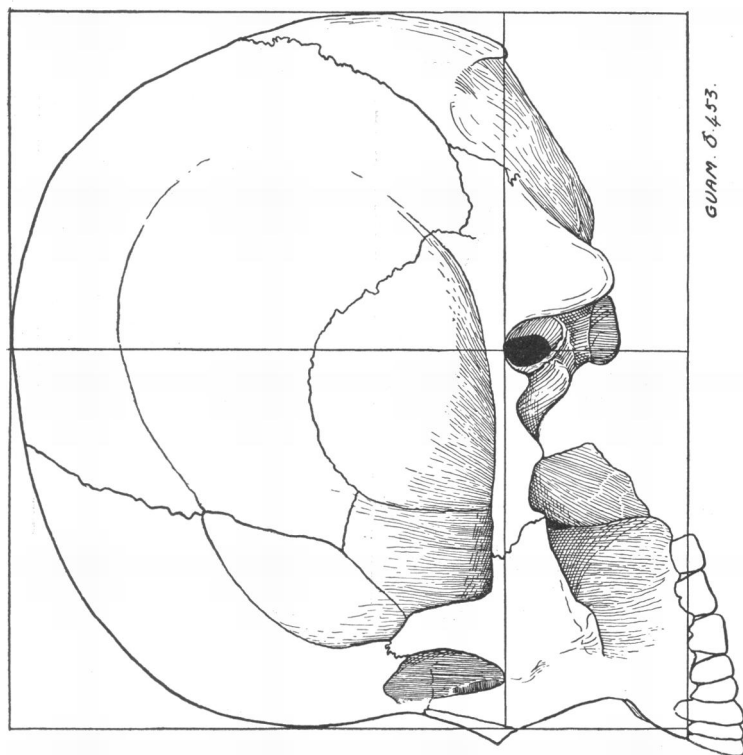
Honolulu

THE skulls included in this series were excavated from burials in Guam by Dr T. C. Thompson and Mr H. G. Hornbostel, officers in the United States Navy. They were collected in January 1922, and the entire collection is in the possession of the Bernice P. Bishop Museum, to the authorities of which institution I am indebted for permission to examine them. The archaeological findings concerning these burials are as yet somewhat incomplete; but there can be no doubt that the burials are of the pre-Spanish period, and that they represent the indigenous race of Guam, uninfluenced by the influx and mixture of Spanish, Mexican, Philippino and Chinese that have produced the racial mixture of the present Chamorres. The outstanding feature of this series of skulls is its extraordinary homogeneity and the well-differentiated cranial and facial type that prevails in all individuals. In non-metrical morphological features, as in gross characters, these skulls differ widely from the Polynesian type, and in their general form they may, for the present, be assumed to represent an insular race, the place of origin and affinities of which are so far undetermined¹.

In the series available to me at the time I made my examination there were the remains of ninety-two persons. Of these, only six were sufficiently complete for entire skulls to be associated with more or less intact pelves. In these examples cranial sexual characters were so well differentiated that the sexing of the remainder of the series by cranial characters alone has a comparatively high guarantee of accuracy. Thirty-three skulls could confidently be regarded as being female and thirty-three as male: the remaining twenty-six were too fragmentary or too indeterminate in type to justify any precise diagnosis of sexual or morphological characters. The number of skulls from which deductions may be drawn is therefore small, but perhaps this defect is in part compensated for by the remarkable homogeneity of the series.

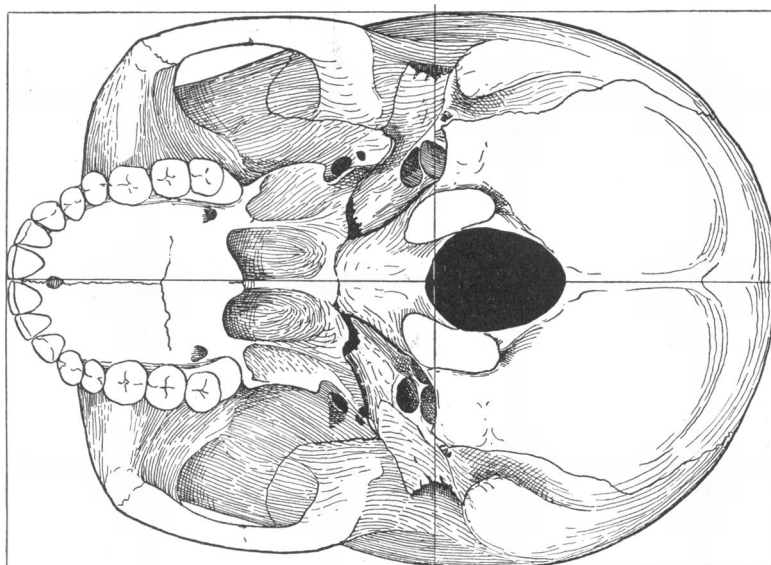
(1) *Cranial Form.* The typical skull may be described as a massive and symmetrical cranium with a contour in the norma verticalis most nearly represented by Sergi's sphenoid and with a somewhat angular outline. The typical female skull is distinguished by its more regular oval form. The occiput is rather steep, the forehead square and the temporal fossae moderately well filled.

¹ The examination of a series of crania in the Museum of the University of Sydney leaves no doubt that these skulls from Guam are of the same racial type as those from New Caledonia and the Loyalty Islands. F. W.-J.



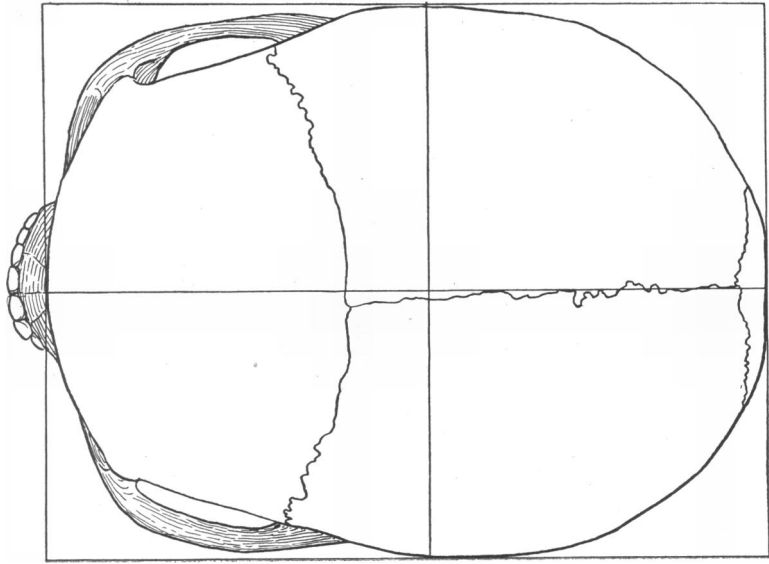
GUAM, ♂ 453.

Fig. 2. Norma lateralis.



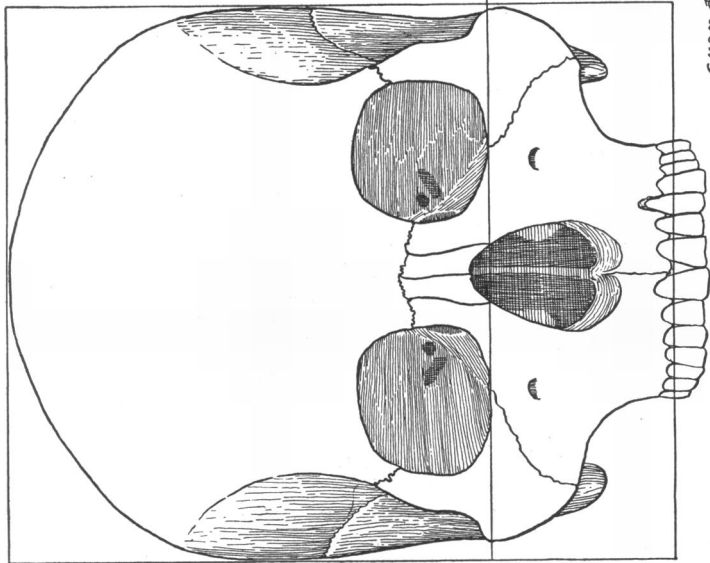
GUAM, ♂ 453

Fig. 1. Norma basalis. Typical Guam male. Sexed from the pelvis. All figures reduced to half natural size.



GUAM ♂ 453.

Fig. 4. Norma verticalis.



GUAM ♂ 453.

Fig. 3. Norma facialis.

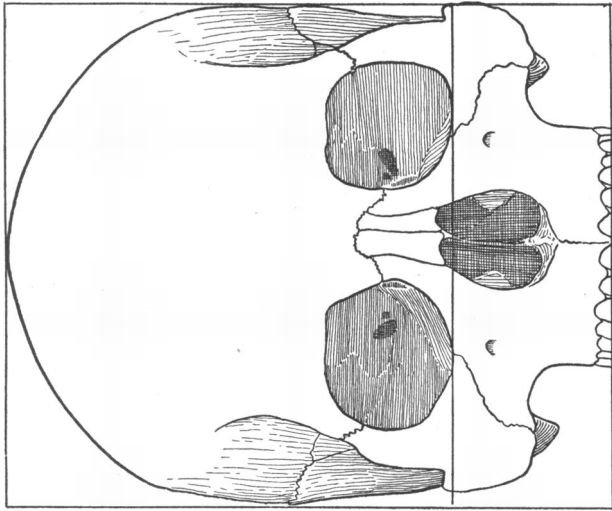


Fig. 6. Norma facialis.

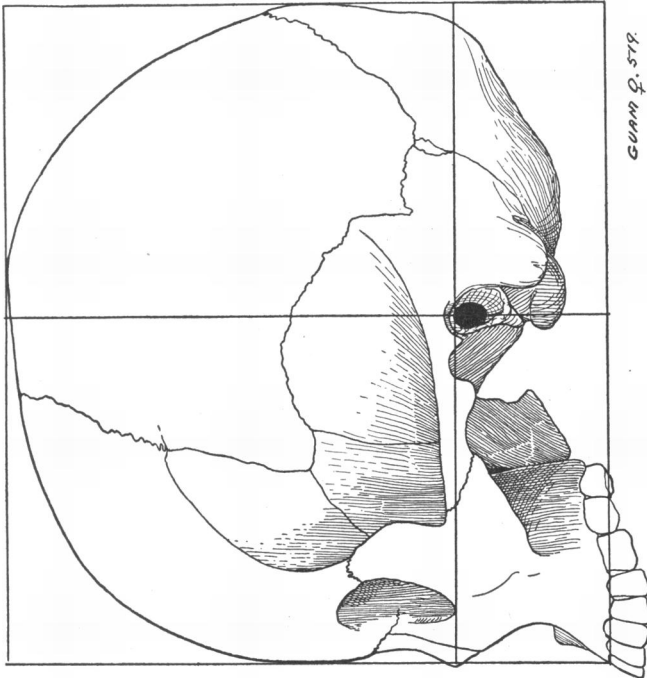
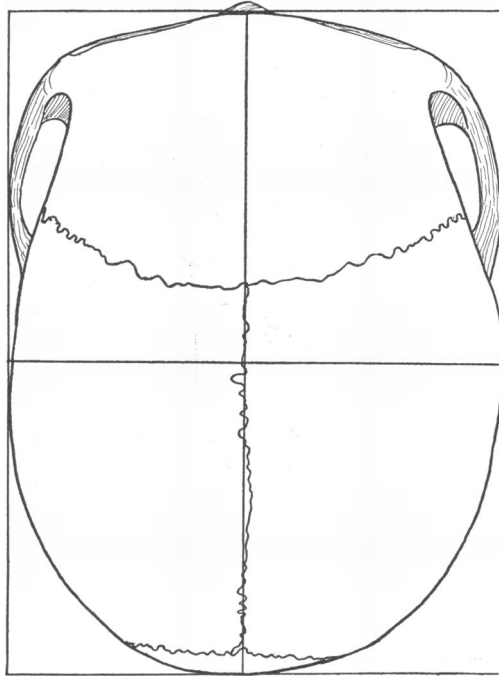


Fig. 5. Norma lateralis. Typical Guam female sexed from the pelvis.



GUAM. Q. 59.

Fig. 7. Norma verticalis.

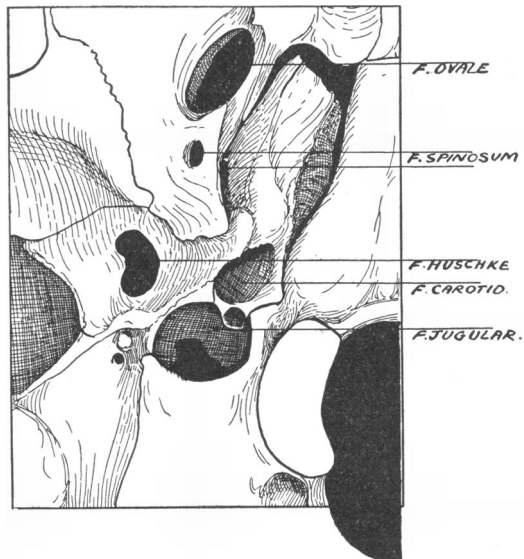


Fig. 8. The region of the foramen lacerum medium to show the type common in skulls from Guam.

(2) *Cranial Asymmetry*. Of the whole series of skulls as many as 42 per cent. showed no obvious degree of asymmetry as judged by inspection in the norma verticalis. Symmetry, so estimated, was present in 36 per cent. of the males and 48 per cent. of the females. Normal asymmetry occurred in 44 per cent. of the total series (50 per cent. of the males and 38 per cent. of the females). Reversed asymmetry was present in 14 per cent., and in this feature the sexes showed equality.

(3) *The Sutures* in all cases were of a very simple pattern. In 30 per cent. of cases the sutural pattern was noted as being conspicuously free from complications. No case of metopic suture was present in this series.

(4) *Ossa Suturarum*. Womian bones are infrequent and no large or striking inclusions were present.

Lambdoid ossicles were present in 23 per cent. of the whole series (10 per cent. in the males and 36 per cent. in the females). No case of a true interparietal bone was met with. The ossicles were multiple in 10 per cent. of the total series.

Ossicles occurred in the occipito-mastoid suture in only 3 per cent. of the total series. Coronary ossicles were entirely absent.

(5) *The Pterion* was of the normal type in every example, and in 50 per cent. of the cases it was noted that there was an unusually elongated alisphenoid-parietal contact.

(6) *Epipteric Bones* were present in only 6 per cent. of the total series, there being three times as many cases in females as in males. In only one instance—that of a female—was the bone confined to one (left) side.

(7) *Supra-orbital Foramina, Notches and Grooves*. Bilateral supra-orbital notches, for the most part extremely shallow, were present in 86 per cent. and bilateral foramina in only 5 per cent. The condition differed upon the two sides in 9 per cent. and in these asymmetrical examples a notch was present on the right and a foramen on the left in 6 per cent., the reversed condition being present in 3 per cent. Accessory notches or foramina were present in 32 per cent. of the total series: they occurred bilaterally in 7 per cent., on the right side only in 18 per cent., and on the left side only in 7 per cent.

(8) *Anterior Ethmoidal Foramen*. In only thirty skulls could the site of the foramen be determined beyond all possibility of doubt. Of these examples the foramen perforated the fronto-ethmoid suture in sixteen (53.3 per cent.), and the frontal above the suture line in fourteen (46.6 per cent.). No sexual difference in the site of exit was evidenced in this small series.

(9) *Sutures of the Inner Wall of the Orbit*. In no case was any anomaly recorded.

(10) *Spheno-maxillary Fissure*. The fissure was narrower than the European normal in 59 per cent. It was of normal width in 32 per cent., wider than the average in only 2 per cent. and of the narrow type but with expanded extremity in 7 per cent.

(11) *The Orbits* are most commonly only very slightly oblique. Such a con-

dition was present in 66 per cent., and in 9 per cent. of the cases in which there was obliquity this condition was more apparent on the right side than on the left. In 34 per cent. the axis of the orbits were adjudged to be level. The shape of the orbits is conspicuously square, and "square and nearly level" is the description that applies to the orbit typical of the series.

(12) *The Infra-orbital Canal.* A single discrete foramen gave exit to the nerve in 55 per cent.; a minute accessory foramen was present in 45 per cent. In 31 per cent. this minute accessory was present on both sides and in 14 per cent. it was unilateral—the right and left sides being equally represented. In only one case could the canal be described as double and here the duplication was confined to the right side.

(13) *The Form of the Jugal.* One of the most striking features of this series of skulls is the massiveness of the malars and the eversion of their lower margins. Combined with this is great thickness of the lower margin of the zygomata and a sharply angled (instead of curved) junction of the zygomata with the facial portion of the skull. Subdivision of the malars was not met with.

(14) *Nasal Bones.* The nasal bones were noted to be narrow at their upper extremities in 50 per cent. Inequality of the upper extremities occurred in 40 per cent., and the right bone was broader than the left four times as often as the reverse condition. In 14 per cent. of cases the upper extremities were synostosed in some degree: the condition was present in both sexes but never in young skulls.

(15) *The Narial Aperture* is typically a low ovoid. The narial margins are practically always double, the ridges being low and their separation considerable in 70 per cent. In 23 per cent. the divergence of the margins and the continuity between the superior alveolar surface and the floor of the nasal chamber reached the condition that is best described as guttered. In only 7 per cent. were the margins approaching the condition that can be termed sharp and these more sharply marked margins were all present in the skulls of women. There is a conspicuous degree of apparent subnasal prognathism in the typical skull.

(16) *The Nasal Septum.* The condition of the septum could be recorded in so few cases that the figures probably lack any significance.

(17) *The Foramen Ovale.* The posterior wall of the foramen ovale was abnormally thin or reduced to a mere spicule of bone in 9 per cent. of all cases and in this feature the sexes were equal. No case was met with in which the posterior wall was altogether lacking; but confluence of the foramen spinosum and foramen ovale was present in as many as 11 per cent., no sexual distinction being shown. The foramen, when otherwise normal, was recorded as unusually small in 33 per cent. and as unduly large in 20 per cent.; these anomalies in size were apparently not correlated with any corresponding variations in the foramen of Vesalius.

(18) *The Foramen of Vesalius.* The foramen of Vesalius was present in only 9 per cent. of the total series, and in only one case was its occurrence unilateral.

(19) *The Foramen Spinosum* was present as a completed bony canal in 42 per cent. of all the cases in which its condition could be diagnosed with certainty. It was incomplete on both sides in 18 per cent. and incomplete on one side or the other in 29 per cent. In 18 per cent. it was complete on the right and incomplete on the left and in 11 per cent. it was complete on the left side only. In 11 per cent. it was confluent with the foramen ovale.

(20) *The Spina Angularis Sphenoidei*. The spine is typically a large but clumsy prolongation of the angle, lacking definition as a sharp discrete prominence or even as a defined ridge. In the great majority of skulls its most noteworthy feature is its overflow over the petrous posteriorly. This condition may occur upon one side or both. In the example figured (see fig. 8) the features depicted are bilateral.

(21) *The Laminae Pterygoidei*. The lamina lateralis is typically wide-spread, but not greatly enlarged laterally. Both laminae are distinguished by their thickened lower margins, their stoutness, and the marked muscular impressions. The tendency to the formation of a pterygo-spinous bar is displayed only in a manifestation to develop a ridge to the medial side of the foramen ovale.

(22) *The Jugular Foramen* was recorded as approximately equal upon the two sides in 20 per cent. of cases. The right canal was considerably larger than the left in 64 per cent. and the left larger than the right in 16 per cent. No sexual differences were detected.

(23) *The Tympanic* as it forms the floor and the orifice of the external auditory meatus is notably under-developed in this series. This under-development finds partial expression in the high frequency of the foramen of Huschke (32 per cent.) and the number of cases (20 per cent.) in which the styloid processes fail to be present. The external auditory meatus is typically large and ringed round by a thin plate of bone which fails markedly in its lateral development. The tympanic was noted as being of normal or somewhat subnormal massiveness in 44 per cent. and of striking under-development in 56 per cent.

(24) *The Foramen of Huschke*. This was present as a large gap in the floor of the external auditory meatus in no less than 32 per cent. of the entire series. In 27 per cent. the foramen was bilateral and in 5 per cent. it was confined to one side, there being an equal number of unilateral occurrences on either side.

(25) *The Styloid Processes* were present in 80 per cent. of the total series. They were of normal or more than normal development in 36 per cent., small in 36 per cent. and rudimentary in 8 per cent. In 20 per cent. they were entirely absent and this condition was confined to the female.

(26) *The Posterior Condylloid Foramina*, when present, are usually small in size. Small bilateral foramina were present in 65 per cent. of all the cases in which the condition could be determined with certainty. They were completely lacking in 9 per cent. A single foramen was present on the right side only in 17 per cent. and on the left side only in 9 per cent.