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coveries do advance a step. The more closely the area of the Greensand and the Chalk Plateau is examined, the more firmly, I believe, will every one of Prof. Prestwich's conclusions be established—namely, that, in this area, a distinction can be drawn; three geologic stages may be traced and two archaeological stages: (1) the age of the denudation of existing river-valleys; (2) the Lower Greensand age, geologically distinct, but to the archaeologist, similar, as the implements in use are of river-valley types; (3) the Chalk Plateau age, when the implements are as a whole of a ruder type; and (4) that the chipped flints are, as a class, and in their great majority, the authentic handiwork of man.

Thus the argument leads us to the verge of an epoch, which, judged by its consequence, the dispersion of mankind, must have been of longer duration than the river-valley period. Probably during this epoch, under various local influences, divers stocks of mankind grew slowly into separate races. Of this the plateau-finds—accept them in all fulness—tell us nothing; but after thinking many times, and with great and grateful consideration for any opinion of Sir John Evans, I do believe that they lift the veil for a moment beyond the time when the tools of the river-valley type were in universal use; and that Mr. Harrison, their discoverer, has, to borrow a metaphor from the neighbouring shade of the Bodleian, deciphered from the hard palimpsest of earth another page in the most interesting of all epics, the story of human life.

A CRITICAL STUDY of the COLLECTION of CRANIA of *Aboriginal Australians in the Cambridge University Museum*. By W. LAURENCE HENRY DUCKWORTH, B.A.

Material.—The number of crania is, in all, thirty-eight, and of these, twenty-nine are crania of adults, five of aged persons, and four of youths.

Sex.—Of the adults, five are females and twenty-four are males. The five aged are all males. Of the four young skulls, two belonged to youths of about eighteen to twenty years of age, one a child of seven or eight, and one a young female of about twelve or thirteen years.

INTRODUCTORY FOOTNOTE.

A description of these skulls was commenced by Prof. Macalister, and the present writer has had the benefit of Prof. Macalister's notes and measurements. The notes have been incorporated in the craniological part, and the measurements were revised and added to in the craniometrical part of the present work, which is thus an extension of that begun by Prof. Macalister.

Geographical classification.—Ten specimens are from South Australia, and with ten skulls of "Murray" natives, form a group of twenty South Australians.

Six specimens are from New South Wales and four from Victoria, two from Western Australia, one from the Northern Territory of South Australia, and one from Melbourne (but the exact locality whence the last was obtained is not recorded).

Of the source of four specimens, three of which accompany complete skeletons, there is no record.

State of preservation.—The state of preservation varies widely as may be gathered from the tables of measurement, and from the detailed descriptions of the individual specimens.

Plan of work.

Measurements were made and tabulated.

A carefully detailed description of each specimen has been written, describing the age, sex, state of preservation and appearances presented in the several *normae*: individual peculiarities were recorded. This series of descriptions follows the numerical order of the Cambridge catalogue, without regard to the grouping of the crania according to districts or tribes.

Tables I and III.

i. *Discussion of the measurements.*—These, which number about forty-six, are arranged in a table of general measurements, and the corresponding averages are arranged in another table.

Tables II and IV.

ii. For skulls upon which all the above measurements could be made, a series of thirteen indices has been made out, the number of indices varying for skulls which are not complete: the averages of these indices are arranged in a separate table.

Tables V, VI, VII.

iii. Tables of additional measurements are three in number, and comprise:

- (a) Measurements of the mandible.
- (β) Miscellaneous: lengths of sutures, &c.
- (γ) Dimensions of teeth (two tables).

And for these the averages are arranged in the respective tables.

Tables VIII and VIIIA.

iv. Special tables present the measurements of certain groups of crania, viz., all those of South Australians; all those from New South Wales; and all those from Victoria. In these tables the indices and a limited number only of measurements will be found.

Table IX.

v. The method of seriations has been applied to the whole series of indices and to the indices of the group of South Australians. Also to a few of the principal measurements of the same.

Table X.

vi. All the averages of the measurements made have been reduced to the figures which present their relationships to the average basi-nasal length taken as 100. (This of course has already been done for the basi-alveolar length in calculating the alveolar index of the averages.) This table is divided into four columns which correspond to the four columns of the table of averages (Table III). In a subsidiary table are appended the corresponding values as calculated for series of (1) Andamanese Islanders; (2) Fijians; (3) Islanders from Torres Straits; these are taken from Sir William Flower's memoirs in the "Journal of the Anthropological Institute."

Table XI.

vii. The frequency of the occurrence of a certain number of characters such as the epipteric bone, third condyle, &c., was observed and the results have been tabulated.

Table XII.

viii. All the available figures representing the average cubic capacity, cephalic and other indices, have been brought together into one table, so that for instance the average cubic capacity is calculated from 150 cases. The authors whose memoirs have been referred to in this connection are—

Dr. Barnard Davis ("Thesaurus Craniorum").

Sir William Flower ("Journ. Anth. Inst." and "Cat. Roy. Coll. Surgeons").

Sir William Turner ("Challenger" Report).

MM. Quatrefages et Hamy ("Crania Ethnica").

M. Cauvin ("Bull. Soc. Anth. de Paris," 1883).

Table XIII.

ix. Is an additional table, which is really a seriation, and as such will be discussed with the other seriations of Table IX.

Tables XIV and XV.

x. Two skulls have been longitudinally bisected: measurements made on "rubbings" of these have been tabulated with the corresponding measurements made on rubbings of similarly bisected skulls of anthropoid apes and other animals. In the same table are the corresponding measurements made by Sir William Turner on similarly treated skulls of Australians.

N.B.—The skulls of three adults and one aged males present considerable divergences from the usual type. They will be referred to as "doubtful" skulls and the averages of the male skulls, *without* these four "doubtful" skulls, have been arranged in a special column throughout the tables.

Descriptive part.—The work has been resolved into a series of descriptions (craniological) accompanied by measurements (cranio-metrical part). Besides the detailed descriptions, a series of short notes have been written, describing individual peculiarities. From the whole series of descriptions, that of the typical skull has been deduced, and this differs in no important respect from those already published.

Measurements: Explanatory details.—Measurements were made with a craniometer (Flower's) graduated in millimètres, and with a steel tape; and the cranial capacities were estimated by using No. 8 shot, which was arranged by shaking the skull and occasional use of a wooden rammer. The mean of two observations for each specimen, not differing by more than 10 c.c., has been recorded: exceptions to this rule must be made with regard to very imperfect skulls.

Other measurements were made in the usual way. The jugo-nasal breadth and arc are measured according to the directions of Oldfield Thomas in the "Journ. of the Anth. Institute," vol. xiv. p. 333. The anterior palatine breadth is that between the roots of the canine and first premolar teeth; the posterior palatine breadth that between the first and second molar teeth. The horizontal circumference did not include the greatest prominence of the glabella.

Discussion of the tables.—Looking over the facts presented by the various tables, in Table I it may be noticed that the average cranial capacity of twenty-six specimens of both sexes is 1252 c.c. The average capacity of the male skulls is 1269.9 or 1235, according as the four doubtful skulls are included or not. These values accord fairly well with those recorded for other series (by Turner, Flower, and others).

The maximum length exceeds the ophryo-occipital length by a good deal more in the males, than in the females, and thus gives an indication of the greater and more frequent prominence of the glabella in the former sex.

The maximum breadth was usually on or about the parieto-squamous suture, but in one or two instances considerably below this.

The difference between the two sexes is clearly shown in the relative magnitudes of the bi-asterial and bi-stephanic breadths, for in the males the bi-asterial distinctly exceeds the bi-stephanic breadth, whereas in females the two are about equal, the bi-

asterial breadth in females being smaller rather than the bi-stephanic breadth being greater than in males.

As regards the measurements indicating facial breadth (*i.e.*, the external bi-orbital, bi-zygomatic, bi-malar and other breadths) the males exceed the females by very little, except in the case of the bi-zygomatic breadth; in this the difference between the sexes is pronounced, and is doubtless related to the greater mass of muscles working the lower jaw, and occupying the zygomatic fossa, of males. It must be admitted that this comparison is only drawn from *three* female skulls, but it is borne out by the dimensions of female skulls in other collections.

The bi-zygomatic, besides exceeding the other measurements of facial breadth, often nearly coincided with the maximum parieto-squamous breadth of adult males, but in the young skulls was much below that breadth. This again indicates the relative size of the masticating muscles in the two cases.

Height.—The basi-bregmatic height, in most cases, is slightly smaller than the maximum parieto-squamous breadth. This will be referred to later in connection with the group of skulls from South Australia.

The palato-maxillary length is very great in several specimens; the mean value is considerably affected by the presence of the four "doubtful" skulls.

The comparative lengths of the frontal, parietal and occipital arcs respectively are of considerable interest in view of the generalisations of M. Cauvin on this subject. ("Bulletin de la Soc. Anth. de Paris," 1883, p. 253.) This writer states that in the crania of Australians (and of Papuans and Melanesians), the parietal arc exceeds in length the frontal occipital arcs. In thirty-one specimens of both sexes described by Sir William Turner, the frontal and parietal arcs of eight (five males, three females) were almost equal in length; in twelve (eight males, four females), the frontal was in excess; in eleven (seven males, four females), the parietal was in excess of the frontal.

In the Cambridge collection, out of thirty-three skulls of both sexes, the frontal and parietal arcs of three (two males, one female) were of equal length; in fifteen cases (thirteen males, two females), the frontal exceeded the parietal; in fifteen cases (fourteen males, one female), the parietal exceeded the frontal arc.

Combining all these with the additional cases cited by Sir William Turner (in vol. ii of his report) it appears that of sixty-nine skulls of adults of both sexes, the frontal and parietal arcs are of equal length in eleven cases, the frontal is in excess in twenty-nine cases, and the parietal arc is in excess in twenty-nine cases also.

With regard to the occipital arc: in thirty-four cases out of thirty-six recorded by Sir William Turner, the parietal arc exceeded the occipital; in the remaining two (a male and a female) the occipital arc exceeded the parietal.

Of thirty-one cases in the Cambridge Museum, the parietal was greater than the occipital in twenty-nine, less in two (both males). So that in sixty-seven cases, the parietal arc exceeded the occipital in sixty-three. So that in this respect M. Cauvin's generalisation holds good.

But as regards the frontal and parietal arcs, it appears from a study of sixty-nine skulls of adults of both sexes from the Cambridge and Edinburgh collections, the two arcs are unequal nearly five times as often as not, and that when unequal the frontal arc is just as often the longer of the two as not. So that there is no confirmation of this part of M. Cauvin's statement.

Oblique parietal arc (Macalister).—Mention must here be made of the measurement called by Professor Macalister the "Oblique Parietal Arc." Its plane lies in the general direction of the fissure of Rolando. The mean value in this series is remarkable as being nearly the same for both sexes. No other large series of this measurement are as yet on record, but the following may serve as examples met with in the Cambridge collection.

Australians	343 mm. av. both sexes.
A Tasmanian	336 "
N. A. Indians	365 " av. of 3.
Negroes	368 " av. of 5.
New Zealanders	368 " av. of 3.
Ancient Peruvians	371 " av. of 5.
Modern Europeans	370 " av. of 2.
Kaffirs	375 " av. of 5.
A Carib	375 "
A Murray Islander	375 " { In the Liverpool
An Eskimo (male)	384 " Museum.

Mandible.—The mandible accompanies the cranium in eighteen specimens. The measurements show the excess of the average dimensions of the male over the female mandible. In both the coronoid and condylar heights are nearly equal; in both the intergonial exceeds the gonio-symphysial length, the excess being more pronounced in male jaws.

Average Indices.—The average indices have been calculated in two ways and the results arranged in two tables (IV, and IVa,) one containing the averages of the indices in distinction from the indices of the averages arranged in the other; the former

though less correct, has the advantage of admitting a greater number of instances, and the differences between the two tables will be found for the most part insignificant.

Breadth Index.—The mean breadth index of thirty-eight specimens is 70.5; of twenty-nine males 70; of five adult females 72.9. Four specimens are above the upper limit of dolicho-cephalic skulls (three males, one female); the highest individual index is 76.6, which with the second highest 76, belongs to "doubtful" skulls. Without the four doubtful specimens, the mean breadth index of twenty-five males is 69.2. The lowest index is 64.9, that of the cast of the skull of King Rufus Billy (a Murray native); though the exact state of the sutures of this scapho-cephalic specimen cannot be ascertained, the sagittal appears to be free from synostosis. The next lowest index is 65.9 (No. 2112, in which sagittal synostosis is nearly complete).

Vertical Index.—The mean vertical index of thirty-four crania is 69.6; that of twenty-six males 69.8; that of three females 68.6. The mean height of twenty-five male skulls is 130.5 mm. and their mean breadth is 132 mm.; of four females the mean height is 121 mm., the mean breadth is 128 mm. Altogether the series of skulls is dolicho-platycephalic.

Gnathic Index.—The mean gnathic index of twenty-nine skulls is 101.2, of twenty-two males 101.8, of three females 102.7. Here again the doubtful skulls disturb the average, for when excluded, it is found that the mean index of nineteen males is 102.15. The highest individual index is 108.7 (a South Australian male, No. 2115). From the averages, the whole series and the skulls of each sex fall within the mesognathous group.

Nasal Index.—The mean nasal index of thirty-two skulls was 55.6, of twenty-six males 55.4, of two females 53.25. They fall within the platyrhine group. The highest individual index is 65.1, and one of the "doubtful" skulls possesses the lowest nasal index of the series, viz., 47.4.

Orbital Index.—The mean orbital index of thirty-one skulls is 82.6: that of twenty-four males 81.2; of three females 87.4; accordingly the males are microseme, the females mesoseme. One of the doubtful skulls has an index of 92.7: after exclusion of the four doubtful skulls the mean index for twenty males is 80.5.

Palato-Maxillary Index.—The mean palato-maxillary index of twenty-nine skulls is 111.7; of twenty-two males 110.4; of three females 112.6. Among the males, in four cases a low palato-maxillary index is associated with a high degree of prognathism, the two most pronounced cases being

Skull.	Palato-maxillary Index.	Gnathic Index.
No. 2115	101·5	108·7
„ 2127	92·2	107·1

On the other hand the very dolichuranic skull No. 2140 with an index of 97 has a gnathic index of but 100.

Palate Length.—It might be mentioned in this connection that the comparatively low palato-maxillary index in many Australian crania is due to excessive length rather than reduced breadth; but this palatine length is much increased in many cases by a large tuber maxillare; herein, it is thought, lies a difference between these crania and the dolichuranic crania of anthropoid apes; for in the latter (in the majority of instances, so far available) the maxillary tuberosity is frequently quite insignificant and does not add to the palatine length, so that in this respect the palate of anthropoid apes resembles that of the more highly civilised races of man rather than the aboriginal Australian.

Total Facial Index.—The figures for the total facial index do not accord very well with those published by Dr. Topinard (*“Et. d’Anth. Gén.”* p. 919), where 107·2 is given as the mean index of seven Australians. In the Cambridge collection the mean index of fourteen skulls is 95·4, of ten males 96·2, of two females 93·6; and in the whole series two males out of ten only have indices above 100. The general indication then is of a longer face than that of the Australians referred to by Topinard. For the superior facial index of Broca, nineteen skulls give an average of 73·4, thirteen males of 73·7, three females 74·1. Topinard, quoting Broca’s figures, gives 69·7 as the mean of twenty-seven Australians. Sir William Turner’s *“Challenger”* Report contains figures which give 65·1 as the mean index of twenty-eight skulls. Both these observations denote faces shorter than those of the skulls in the Cambridge collection. Sir William Turner’s series contained only three skulls from South Australia, whereas the majority of the skulls here described are from that district, and none of these presents an index below 71.

Facial Indices.—It might be supposed that this is a feature characteristic of skulls from South Australia, but it must be admitted that no great reliance can be placed on such an index as this, depending as it does on the position of the ophryon. The superior facial index of Kollmann avoids this difficulty, and it is interesting to find that here again the indices of the skulls

at Cambridge indicate a longer face on the average than do the indices calculated from the data furnished by Sir William Turner in the memoir already referred to. (Thus, the mean index of twenty-one skulls is 51.7, of fifteen males 51.8, of two females 51. Turner's figures give 48.8 as the average of thirty-three skulls, of twenty-one males 48.6, of nine females 48.9. Again the average index of eleven skulls from South Australia in the Cambridge collection is 52.2.) To sum up the facts presented by these facial indices. From three facial indices evidence appears that the skulls in the Cambridge collection, in which South Australians predominate, have a proportionally longer face than those from other districts. The relation of this feature to prognathism cannot be overlooked, and perhaps the difference between the South Australians and other series may be too slight to warrant any conclusions being drawn; but the recurrence of the same difference in three indices respectively, is remarkable.

The average stephano-zygomatic index (of Topinard) indicates that the skulls are highly phaenozygous, the males more so than the females. (Average index of twenty-one skulls is 79.9, of fifteen males 76.5, of three females 81.9.) The mean gonio-zygomatic index of fifteen skulls is 72.9, which agrees fairly well with the figure quoted by Topinard, viz., 75.5 as the average of four Australians.

Naso-Malar Index.—The naso-malar index is of considerable interest owing to the small range of variation throughout this series. The range through twenty-seven skulls is less than 7 units (the range of the cephalic index through twenty-nine males being nearly 12 units). The average index of thirty skulls is 111.4, of twenty-three males 111.2, of three females 110.4. In his paper in the "Journal of the Anthropological Institute," vol. xiv, p. 333, Oldfield Thomas gives 111.1 as the mean index of sixteen Europeans. One would expect the average value for the modern European skull to be somewhat greater than this, or else that of the aboriginal Australian to be somewhat lower.

Dental Index.—The mean dental index of thirteen skulls is 45.2, of eight males (excluding the doubtful ones) 45.8, of two females 49.25. The fact of the female sex possessing the higher index agrees with the figures recorded by Sir William Flower, viz., 44.8 as the average of twenty-two males, 46.1 the average of fourteen females. The relatively smaller basi-nasal length in the latter sex probably is the cause of this apparent discrepancy.

Table VI.

Of the tables of additional measurements but little can be said at present. With regard to the dimensions of the posterior

nares, it may be remarked that while the breadths are nearly equal, the height is only one-half that of the apertura pyriformis of the nose.

The average least distance of the temporal crests is 87.5 mm. (for twenty-two males), and in three females they did not approach nearer than 106 mm.

Teeth.—As regards the dimensions of the teeth, the combined lengths of the lower molars exceed those of the upper set, and the same relation holds good for the combined lengths of molars and premolars. This confirms the statements of Professor Turner in the "Journal of Anatomy and Physiology," vol. xxv, p. 461. With regard to other statements in the same paper, viz., those referring to the apposition of the teeth, the confirmation is not so clear. Professor Turner makes the statement concerning a skull from South Australia, that the two sets of teeth are in contact by their cutting edges "when the condyles of the lower jaw were articulated, and placed in contact with the ridge that bounded the back of the glenoid fossa, and the teeth clenched."

The following specimens at Cambridge were available for examination with regard to this point, and the following notes present the results of such an investigation:—

No. 2,101. South Australia (a cast and not the original skull).

When the condyles rest in the glenoid fossa, no such apposition as was described is observed; on placing the mandible in such a position that apposition occurs, it is found that the condyle is resting on the rounded *anterior* border of the glenoid fossa formed by the anterior root of the zygoma. This might well be the position in life, as room would be afforded for the interarticular cartilage.

No. 2,115. South Australia, male.

The lateral superior and two left lower incisors only persist. On placing the jaw in the desired position firmly, the condyles are found *not* to be in contact with any part of the floor or boundaries of the glenoid fossa, being separated by an interval of less than 1 mm., which was presumably occupied by the interarticular cartilage.

No. 2,128. South Australia, male.

Arrangement very similar to No. 2,115, but the right condyle just touches the anterior border of its glenoid cavity.

No. 2,137. When the mandible is placed in the position in which the incisors bite surface to surface, a considerable area of the condyles is found to touch the glenoid fossa. It is here to be remarked that the glenoid fossa of this specimen are very shallow and flattened, the flattening being most pronounced in the region of the anterior border of the cavity, so that the

anterior root of the zygoma is indistinct. It is submitted that such a shallow glenoid fossa is an approach to a state that is usual in anthropoid apes. (Among Australian crania Nos. 2,138, 2,139 and 2140, exhibit the same feature in a less marked degree.) But even here the condyles are not touching the back of the glenoid fossa when the teeth are in apposition.

No. 2,138. Approaches most nearly to the state of affairs described by Sir William Turner. Apposition still occurs when the condyles are in the posterior part of the glenoid fossa.

Nos. 2139 and 2140. Give no very definite evidence, but it seems as if the condyle must occupy an *anterior* position in the glenoid fossa in order that the teeth may be in apposition. The influence of the size of the interarticular cartilage in determining this position has been hinted at by Topinard ("L'Anthropologie," 1892). With regard to the occurrence of this apposition of incisors in races other than Australian, Sir William Turner remarks that he had observed it in a Malay, a Bushman and an Esquimaux, while in 1860 Sir John Lubbock wrote in an account of the Danish kitchen-middens (in the "Natural History Review"), "the tumuli have supplied us with many skeletons of this period . . . one curious peculiarity is that their front teeth did not overlap as ours do, but met one another, as do those of the Greenlanders at the present day. This evidently indicates a peculiar manner of eating."

Further with regard to the occurrence in prognathic or orthognathic skulls, it may be mentioned that the same arrangement was observed in a very orthognathic skull dug up at Chester, during the last few months. It must be added that this specimen gave signs of deformation (though not posthumous) which may be responsible for the appearance of orthognathism.

The group from South Australia.—Table VIII exhibits the indices and a few of the principal measurements of the group of skulls from South Australia, which form so large a proportion of the Cambridge collection. The chief point of interest is in the relative magnitudes of the cephalic and altitudinal indices. Considering averages, the breadth index is 70·2; the height index 68·9; the average skull is therefore dolicho-platycephalic. As regards the sexes, the mean breadth index of fifteen males is 69·6, the mean height index of twelve males is 69·15 (no appreciable difference); the three females, however, have a breadth index of 71·4 and a mean height index of 65·2, and so are very dolicho-platycephalic. Regarding now individual indices, the results as regards the males are different. In thirteen cases out of seventeen, the height index was less than the breadth index (of these, nine were males, three females, one

a youth). Sir William Turner says that of twenty-two crania from South Australia which he examined, seventeen had a lower height index than breadth index. This is exactly the same proportion as in the Cambridge collection. Combining the two sets of data, from a total of thirty-nine crania from South Australia, thirty are dolicho-platycephalic (nineteen males, ten females, and a youth); in two, the two indices are equal; in seven males the height index exceeds the breadth index.

As regards other indices, the gnathic is somewhat higher in this group than in the whole series and the facial indices, as has been said, show a longer face to exist in this collection than in the skulls from other districts. With regard to the frontal, parietal and occipital arcs, their relative lengths are much the same as in the whole series. (Combining the measurements given by Sir William Turner of South Australian skulls, with those in this collection, it appears that of twenty-three skulls, in three the frontal and parietal arcs are equal, in nine the parietal arc is the greater, in eleven the frontal, the occipital exceeding the parietal in two cases, and the frontal in one.) From this review of the features of crania from South Australia, it must be admitted that no other striking feature other than the occurrence of dolicho-platycephalic skulls, distinguishes them from aborigines from other districts. At the same time there is a slight difference in their facial indices, which may also prove distinctive.

Groups from New South Wales and Victoria.—The Table VIIIa refers to the measurements of the groups of skulls from New South Wales and Victoria respectively; they do not contain sufficiently large numbers to justify any general conclusions.

Seriations.—Table IX. The method of seriation of characters has been applied in many cases without modifying the value of the averages as already calculated. There is, however, one notable exception, viz., the vertical or height index of the group of crania from South Australia. By examining the factors of this index, the basi-bregmatic height was found to be the disturbing element, and in consequence its seriation was carefully studied, figures relating to twelve well-authenticated male skulls being used. (Average height = 129.25 mm.) In forming a seriation with 5 units as its modulus, it was found that the crania fall into two groups almost symmetrically arranged with regard to the average figure, the groups being characterised by basi-bregmatic heights greater or less than about 129 mm. respectively.

The small number of skulls renders this statement somewhat unimportant. By collecting all available data, the total number of adult male South Australian skulls was raised to twenty-four; and in a similar seriation the same grouping is again observed,

while it is much more marked when the modulus is 2 units (the diminution in this respect being justified by the increased number of specimens under consideration).

It may be urged that the choice of the modulus (2 or 5) whereby these features were brought out, was quite arbitrary, and this indeed is the case. It seemed then that a modulus of a different dimension should be taken and as in the actual measurements, no less difference than 1 millimetre is taken account of, the choice of unity as modulus would be somewhat less arbitrary. Arranged in seriation thus the arrangement is somewhat obscure, and if plotted out in the form of a curve, the curve is now discontinuous, whereas with 2 as the modulus it was quite graphic. Still a trace of the same arrangement remains and the whole subject is thought worthy of notice.

The interest of this double grouping lies in the fact that according as a skull falls within one or the other group, so it is (at any rate in 80 per cent. of cases) dolicho-platycephalic, or the reverse.

If the race were homogeneous, one would expect the curve of the number of examples to rise gradually, attaining its maximum at the average (a),



whereas in the case of these male South Australians the curve occurs to be of this sort (b),



two groups being observed. It seems then as if the dolicho-platycephalic individuals form a section only of the natives of South Australia. The number of cases (24) here considered is perhaps small, but the constant way in which the double maximum has been seen, first with twelve cases, then with twenty-four, warrants some amount of attention being paid to this method of grouping. At any rate if confirmed it would be a very graphic indication of the mingling of two types, and this is perhaps not far removed from what might be expected in the case of the South Australians, where an admixture of a Melanesian with a Tasmanian element is already suspected. To sum up, while the average male skull from South Australia is feebly dolicho-platycephalic, a study of individuals shows that few present this characteristic of the average skull, and that in fact they are either distinctly dolicho-platycephalic, or decidedly

hypsi-cephalic. If both these types were met with in equal frequency, the average skull would have breadth and height indices equal. Actually, however, for twenty-four male skulls examined, the decidedly dolicho-platycephalic class are somewhat in excess of the decidedly hypsi-cephalic class (viz, 14 : 10) so that the average skull turns out to be as already said, feebly dolicho-platycephalic.

At the risk of rendering this discussion tedious, it must be said that the fact of a *single* character being the basis of an argument affecting the race, was considered unsatisfactory, and it was thought that some confirmation of the groupings ought to be obtained from a study of other characters. At first, a number of seriations were made out for other characters, and it may be said at once, without any evidence of a decided nature being brought out. Next the specimens were arranged in order of size, as regards indices and several dimensions. This is in fact another kind of seriation. The difficulty occurred that among the twenty-four skulls the differences between the third, fourth, and fifth, for instance, with regard to any character (*e.g.*, maximum length), might be much less than the differences between the twenty-second, twenty-third, and twenty-fourth in order. So that this table proved somewhat fallacious and certainly unwieldy.

Accordingly a modification was introduced (and I am much indebted to my friend Mr. P. E. Bateman, of Jesus College, for aid in this arrangement) whereby the range of variation in the magnitude of each measurement or index was divided into six equal portions (the number six happened to be convenient, but is quite arbitrary), and all skulls whose dimensions placed them in the same division were regarded as occupying the same place in the order of the specimens. Thus there might be two specimens in the first rank, five in the second, and so on. Table XIII presents the arrangement.

With such an arrangement, one would expect to find differences emphasized, if any exist. Also the curves corresponding to the figures would be expected to show signs of groups, if such are present. But as a matter of fact this particular arrangement does not admit of any statement as to groups being made, and the corresponding series of curves indicates a *double grouping in the case of basi-bregmatic height*, but in this alone, among the most important measurements studied. Next the corresponding set of figures was worked out for the *average* South Australian (as inferred from average dimensions) and the average Tasmanian. A comparison of these with each other, and with the individual South Australians, has so far only resulted in showing that one skull from South Australia (No. 2,114), besides its superficial

appearance, is in proportions nearly allied to the *average* Tasmanian type. As the whole of this method of seriations aims at the bringing forward of the individual characters, rather than those of the hypothetical average skull, no great importance ought to be attached to the last observations. It is very probable that when tables similar to Table XIII have been made out for an equal number of individuals from Tasmania on the one hand, and other districts in Australia on the other, important results may accrue.

Measurements in terms of Basi-nasal lengths.—Passing to Table X. Here are arranged the principal measurements expressed in terms of the basi-nasal length. They have thus most interest in comparison with other groups of crania whose measurements have been similarly modified. Such are the groups of Andamanese Islanders and Fiji Islanders in the memoirs of Sir William Flower, and the group of Torres Strait Islanders described by Oldfield Thomas, in the "Journ. of the Anthropol. Inst." Table Xa. Adult males of these groups are arranged in a comparative table, with the adult male Australians. The most striking features are these: the micro-cephalic character of Australians is emphasized; the basi-bregmatic heights of Australians and Fijians contrast strongly (the latter being the higher of the two), the Torres Strait Islanders hold an intermediate position in this respect. The small bi-auricular breadth of Australians is to be noticed as well as in the relative lengths of frontal and parietal arcs, where again there is no confirmation of the statement that the parietal arc is the greater in Australians. The basi-alveolar length has been discussed as the gnathic index; here it shows a less prognathic face than those of Fiji or Torres Strait Islanders.

Concluding Tables.—In concluding this paper, attention is directed to the table which gives the averages of several indices as collected from all available sources, notably the average breadth index of 214 skulls of both sexes being 70.95, the average height index from 171 skulls being 71.5. Finally the Table XI presents details of an anatomical nature referring to the occurrence of what are regarded as anomalies in European crania; possibly the traces of a third occipital condyle and of a divided occipital bone are the most significant.

The Tables XIV and XV having reference to measurements made on rubbings of longitudinally bisected skulls of Australians, Europeans, and also of apes and lower animals, are of considerable interest which is of a general zoological nature, rather than anthropological. These measurements will therefore be considered apart.

Females and Youths.

2103	2110	2120	2121	2124	2130	2132	2111
Adult.	Adult.	Adult.	Adult.	Age 12.	7 or 8.	Adult.	{ Young Adult.
(?)	1138	(?)	1075(?)	1243	1240	1210	1165
177	180	175	177	173	176	176	183
(?)	175	170	174	171	167	174	179
(?)	178	175	175	173	176	176	180
126	127	124	128	127	123	134	129
101	107	104	101	108	105	106	103
103(?)	100	107	97	104	105	107	98(?)
110	112	102(?)	106	100	102	110	108
91	95	90(?)	88	91	92	99	96
105	105	(?)	103	96	95	109	106
(?)	123	(?)	123	108	110	125	123(?)
(?)	110	(?)	108	95	98	118	114
(?)	90	(?)	90	78	76	101	95
(?)	103	(?)	95	86	90	103	100
(?)	110	(?)	(?)	95	90	107	(?)
(?)	89	(?)	89	76	82	97(?)	92
(?)	65	(?)	68	55	56	65(?)	63
(?)	103	(?)	96	82	85	92	95
(?)	99	96	92	84	91	94	94
124(?)	127	115	115	118	122	126	118
(?)	122	111	115	120	123	123	117
(?)	109	100	110	109	120	110	107
(?)	82	72	89	86	75	81	84
(?)	38	29	33	35	33	33	34
(?)	28	27	26	25	28	29	28
(?)	37	(?)	35	31	34	31	37
(?)	41	(?)	37	37	37	40	39
(?)	45	(?)	49(?)	41	39	47(?)	45
(?)	25	(?)	25	23	21	23	23
(?)	57	(?)	54	45	45	57	55
(?)	63	(?)	63	56	55	63	62
115(?)	126	118	114	124	118	132	130
117(?)	124	128	114	131	124	120	127
55(?)	53	59	54	46	67	69	54
(?)	51	46	60	55	44	53	54
272(?)	278	284(?)	272	287	278	308	277
321(?)	344	330(?)	344	340	326	346	342
(?)	114	(?)	106	95	105	112	112
490	495	481	490	483	485	500	505
(?)	28	(?)	29	26	32	27	27
(?)	38	(?)	41	31	34	39	38
(?)	27	(?)	24	21	23	27	28
(?)	191	(?)	190	179	177	178	185
(?)	200	(?)	200	183	182	190	193

TABLE III.—*continued.*

<i>Averages.</i>	All the males.			
	24 adults, 5 aged.			
		No.	Range.	
Cubic capacity	1269.9	20	1020	1535
Maximum length	188	29	175	202
Ophryo-iniac length	183	29	166	195
Ophryo-occipital length	183	29	173	194
Maximum breadth	132	29	118	142
Bi-asterial breadth	109	25	97	119
Bi-stephanic breadth	102	28	89	118
Bi-auricular breadth	115	26	106	122
Minimum frontal breadth	98	29	79	104
External bi-orbital breadth	108	29	97	120
Bi-zygomatic breadth	133	15	123	145
Bi-malar breadth	119	23	109	128
Bi-maxillary breadth	94	24	82	103
Jugo-nasal breadth	102	23	94	117
Naso-mental length	114	12	108	121
Ophryo-alveolar length	98	16	90	105
Naso-alveolar length	68	22	60	75
Basi-alveolar length	103	20	95	112
Basi-nasal length	101	25	93	110
Basi-bregmatic length	130.5	25	122	139
Basion to obelion length	125	23	117	134
Basion to lambda length	115	25	109	122
Basi-iniac length	81	25	70	90
Basion to opisthion length	35	25	30	41
Breadth of foramen magnum	30	25	25	33
Orbital height	33	25	29	38
Orbital breadth	41	24	36	45
Nasal height	49	25	43	57
Nasal breadth	27	25	25	32
Palato-maxillary length	59	22	53	68
Palato-maxillary breadth	65	22	59	71
Arcs: Frontal	130	29	115	146
Parietal	129	29	118	145
Occipital superior	67	29	55	84
Occipital inferior	48	27	35	61
Supra-auricular	307	25	279	310
Oblique parietal	345	26	323	380
Jugo-nasal	113	23	104	129
Horizontal circumference	514	29	475	540
Anterior palatine breadth	30	24	27	34
Posterior palatine breadth	41	24	35	49
Minimum inter-orbital breadth	25	27	22	30
Occipito-spinal length	195	24	179	210
Occipito-alveolar length	203	21	182	220

TABLE III.—continued.

Averages.	Males, without 4 doubtful ones.			
	21 adults, 4 aged.			
		No.	Range.	
Cubic capacity	1235	17	1020	1445
Maximum length	188	25	175	202
Ophryo-iniac length	183	25	166	195
Ophryo-occipital length	183	25	173	194
Maximum breadth	131	25	118	140
Bi-asterial breadth	109	21	97	119
Bi-stephanic breadth	101	24	89	118
Bi-auricular breadth	114	22	106	122
Minimum frontal breadth	98	25	79	104
External bi-orbital breadth	108	25	97	120
Bi-zygomatic breadth	131	12	123	141
Bi-malar breadth	118	19	109	128
Bi-maxillary breadth	93	20	82	103
Jugo-nasal breadth	101.5	19	94	117
Naso-mental length	113	9	108	121
Ophryo-alveolar length	98	13	90	105
Naso-alveolar length	67	18	60	73
Basi-alveolar length	103	17	95	112
Basi-nasal length	101	22	93	109
Basi-bregmatic length	130	22	122	139
Basion to obelion length	124	20	117	134
Basion to lambda length	114	22	109	122
Basi-iniac length	82	22	70	90
Basion to opisthion length	35	22	30	41
Breadth of foramen magnum	29	22	25	33
Orbital height	33	21	29	36
Orbital breadth	41	20	36	45
Nasal height	50	21	43	52
Nasal breadth	27	21	25	32
Palato-maxillary length	65.5	18	53	68
Palato-maxillary breadth	65	18	59	71
Arcs: Frontal	131	25	115	146
Parietal	128	25	118	145
Occipital superior	66	25	55	84
Occipital inferior	48	24	35	61
Supra-auricular	307	21	279	310
Oblique parietal	343	22	323	356
Jugo-nasal	113	19	104	129
Horizontal circumference	513	25	475	540
Anterior palatine breadth	30	20	27	34
Posterior palatine breadth	41	20	35	49
Minimum inter-orbital breadth	25	23	22	30
Occipito-spinal length	195	20	179	210
Occipito-alveolar length	204	18	191	220

TABLE III.—*continued.*

<i>Averages.</i>	All the females but one.			
	5 adults.			
		No.	Range.	
Cubic capacity	1174	2	1188	1210
Maximum length	177	5	175	180
Ophryo-iniac length	178	4	170	175
Ophryo-occipital length	178	4	175	178
Maximum breadth	128	6	124	134
Bi-asterial breadth	104	5	101	107
Bi-stephanic breadth	103	4	97	107
Bi-auricular breadth	109.5	4	106	112
Minimum frontal breadth	94	4	88	99
External bi-orbital breadth	105.5	4	103	106
Bi-zygomatic breadth	121	3	123	125
Bi-malar breadth	115	3	108	118
Bi-maxillary breadth	94	3	90	101
Jugo-nasal breadth	100	3	95	103
Naso-mental length	108.5	2	107	110
Ophryo-alveolar length	89	2	89	89
Naso-alveolar length	87.5	2	85	88
Basi-alveolar length	97	3	92	103
Basi-nasal length	95	4	92	99
Basi-bregmatic length	121	4	115	127
Basion to obelion length	118	4	111	123
Basion to lambda length	107	4	100	110
Basi-iniac length	81	4	72	89
Basion to opisthion length	32	4	29	33
Breadth of foramen magnum	27.5	4	26	29
Orbital height	34	3	31	37
Orbital breadth	39	3	37	41
Nasal height	45	1	45	45
Nasal breadth	26	3	25	28
Palato-maxillary length	53	3	54	57
Palato-maxillary breadth	63	3	63	63
Arcs: Frontal	122.5	4	114	132
Parietal	121.5	4	114	128
Occipital superior	56	4	53	59
Occipital inferior	52.5	4	46	60
Supra-auricular	284	3	272	303
Oblique parietal	344.5	3	344	346
Jugo-nasal	111	3	106	114
Horizontal circumference	491	5	481	500
Anterior palatine breadth	28	3	27	29
Posterior palatine breadth	39	3	38	41
Minimum inter-orbital breadth	26	3	24	27
Occipito-spinal length	186	3	178	191
Occipito-alveolar length	197	3	190	200

TABLE IV.

<i>Averages of the Indices.</i>	All the skulls.				All the males.			
	29 adults, 5 aged, 4 youths.				24 adults, 5 aged.			
Index.		No.	Range.			No.	Range.	
Cephalic	70·5	38	64·9	76·6	70	29	64·9	76·6
Vertical	69·6	35	63·2	77	69·8	26	63·2	76
Alveolar	101·2	29	93·4	108·7	101·8	22	95	108·7
Orbital	82·6	31	70·5	94·9	81·2	24	70·5	92·7
Nasal	55·6	32	47·4	65·1	55·4	26	47·4	65·1
Palato-maxillary	111·7	29	92·2	128·3	110·4	22	92·2	128·3
Facial, total	95·4	14	87·5	105·5	96·2	10	87·5	105·5
Facial, superior (Broca)	73·4	19	66·7	84·7	73·7	13	66·7	84·7
Facial, superior (Kollmann)	51·7	21	47	58·5	51·8	15	47·1	58·5
Stephano-zygomatic	79·9	21	68·5	96·3	76·5	15	68·5	85·2
Gonio-zygomatic	72·9	15	65·35	79·7	72·3	11	65·35	77·9
Naso-malar	111·4	30	107·8	116·7	111·2	23	107·8	114
Dental (Flower)	45·2	13	38·6	50	44·2	10	33·6	49·5

TABLE IV.—*continued.*

Averages of the Indices.	Males without the 4 doubtful ones.				Adult Females (5).			
	21 adults, 4 aged.							
		No.	Range.			No.	Range.	
Cephalic	69·2	25	64·9	75·1	72·9	5	70·6	76·1
Vertical	69·3	23	63·2	76	68·6	5	65	71·6
Alveolar	102·15	19	95	108·7	102·7	3	97·9	104·3
Orbital	80·5	20	70·5	87·9	87·4	3	77·5	94·6
Nasal	55·9	22	51	65·1	53·25	2	51	55·5
Palato-maxillary	109·6	18	92·2	128·8	112·6	3	110·5	116·7
Facial, total	94·6	7	87·5	105·2	98·6	2	91·8	95·4
Facial, superior (Broca)	73·4	10	66·7	84·7	74·1	3	72·35	77·6
Facial, superior (Kollman)	52·1	11	47·1	58·5	54	2	52·8	55·3
Stephano-zygomatic	75·8	12	68·5	85·2	81·9	3	78·9	85·6
Gonio-zygomatic	71·7	8	65·85	77·9	74·25	2	68·8	79·7
Naso-malar.. .. .	111	19	107·8	114	110·4	3	106·7	111·6
Dental (lower)	45·8	8	41·6	49·5	49·45	2	48·9	50

TABLE V.—MEASUREMENTS ON THE LOWER JAW.

Males.															A	Females.				B	C	D
Number of Skull ...	2101	2102	2105	2115	2119	2122	2128	2131	2133	2134	2137	2138	2139	2140	Average	2110	2124	2130	2132	Average	Average	Average
Height at symphysis ...	43	32	33	33	22	30	29	33	31	29	29	29	31	32	32	35	26	23	32	33.5	32	31.3
Coronoid height ...	70	45	67	50	61	58	57	68	73	68	59	65	54	65	61	63	44	46	55	59	59	58.9
Condylar height ...	63	48	64	49	54	49	52	65	73	63	58	61	54	61	58	61	44	41	52	56.5	56	56
Gonio-symphysial length ...	87	95	82	80	79	78	77	90	83	78	80	77	76	84	82	81	65	61	80	80.5	82	79.6
Intergonial breadth ...	101	102	109	83	97	95	93	99	113	96	93	91	96	105	98	98	79	84	86	92	97	95.35
Intercoronoid breadth ...	105	103	101	87	92	103	92	101	105	101	87	95	100	97	98	95	?	83	94	94.5	97	96.6
Intercondylar breadth, external ...	123	123	120	115	116	116	114	113	130	117	108	108	118	126	118	115	90	98	111	113	117	114.6
Intercondylar breadth, internal ...	81	92	78	79	?	78	79	71	85	79	68	69	80	82	78.5	78	62	74	72	75	79	77.1
Breadth of ascending ramus ...	39	39	36	38	33	32	34	43	38	40	41	35	37	40	38	36	32	31	36	36	38	37
Angle of ascending ramus	128°	123°	113°	133°	126°	132°	124°	127°	116°	114°	110°	107°	126°	102°	120°	112°	118°	127°	119°	115°·5	120°	120°
Basal-mental length ...	?	112	117	118	122	108	110	124	123(?)	106	106	111	117	115	113	116	90	90	103	109.5	113	109.5
Ophryo-mental length ...	160	138	138	138	112(?)	138	135	145	140	135	139	138	139	134	140	134	120	114	131	132.5	140	136.4

Average of all males without No. 2119: A.

Average of 2 adult females: B.

Average of males without Nos. 2119, 2131, 2133, 2134: C.

Average of all of both sexes: D.

TABLE VI.—ADDITIONAL MEASUREMENTS.

Skull.	Weight with jaw.	Weight without jaw.	Length of Parieto- sphenoid suture.		Length of Lacrymo- ethmoid suture.		Choanae or Posterior nares.		Length of floor of nasal cavity.	Least dis- tance be- tween the temporal crests.
			Right.	Left.	Right.	Left.	Height.	Breadth.		
2101	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(?)	66
2102	749	656	10	11	8	8	23	26	57	97
2104	—	669	10	6	(?)	(?)	22	27	50	93
2105	985	853	10	12	10	9	22	26	58	100
2106	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(?)	100 (?)
2107	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(?)	97 (?)
2108	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(?)	111 (?)
2112	(?)	(?)	1	(?)	(?)	(?)	(?)	(?)	54 (?)	56
2113	(?)	629	—	—	9	9	23	30	56	71
2114	(?)	577	—	2	(?)	(?)	(?)	(?)	(?)	90
2115	(?)	784	(?)	(?)	7	5	22	27	58	108
2117	893	752	6	3	9	6	24	29	54	90
2118	(?)	669	3	11	9	9	28	29	54	75
2119	634	583	—	11	(?)	(?)	25	25	55 (?)	95
2122	639	559	—	—	3	3	24	28	52	95
2123	(?)	580	—	—	10	11	30	29	50	104
2125	(?)	533	13	14	(?)	11	27	32	53	104
2126	(?)	606	5	(?)	7	7	24	27 (?)	46	77
2127	(?)	686	11	(?)	(?)	(?)	27	27	46	89
2128	669	574	(?)	10	(?)	(?)	26	23	55	82
2129	(?)	(?)	3	3	(?)	(?)	(?)	(?)	(?)	94
2131	897	771	15	17	10	(?)	25	26	80	88
2133	800	677	10	12	(?)	14 (?)	(?)	(?)	50	96

TABLE VI.—ADDITIONAL MEASUREMENTS—*continued.*

Skull.	Weight with jaw.	Weight without jaw.	Length of Parieto- sphenoid suture.		Length of Lacrymo- ethmoid suture.		Choanae or Posterior nares.		Length of floor of nasal cavity.	Least dis- tance be- tween the temporal arcs.
			Right.	Left.	Right.	Left.	Height.	Breadth.		
<i>#134</i>	634	534	8	8	11	9	26	29	50	116
<i>#136</i>	(?)	(?)	13	5	(?)	(?)	(?)	(?)	(?)	113
<i>#137</i>	917	809	—	—	6	8	23	27	58	73
<i>#138</i>	880	722	2	—	7	6	26	27	54	65
<i>#139</i>	796	707	14	14	9	6	28	26	59	104
<i>#140</i>	816	711	7	8	6	10	22	29	61	77
<i>#103</i>	(?)	(?)	8	8	(?)	(?)	(?)	(?)	(?)	103 (?)
<i>#110</i>	811	706	—	—	7	7	22	27	54	95 (?)
<i>#120</i>	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(?)	104
<i>#121</i>	(?)	632	—	9	2	5 (?)	26	25	46	95
<i>#132</i>	719	628	5 + w	16	6	7	23	24	48 (?)	119
<i>#124</i>	372	327	—	—	7	7	21	24	45	99
<i>#130</i>	(?)	404	14	12	6 (?)	6 (?)	19	29 (?)	44	118
<i>#135</i>	(?)	588	3	8	10	10	20	27	48	113
<i>#111</i>	(?)	586	3	—	(?)	(?)	23	23	49	91 (?)
Average of all..	753.8 (10)	(29) 634.7	7.7 (23)	9.3 (21)	7.9 (20)	7.8 (19)	24.1 (27)	26.9 (25)	52.6 (26)	92.9 (32)
Average of males	781.5 (13)	(22) 665.5	8 (17)	8.9 (16)	8.5 (15)	7.8 (15)	25.8 (20)	27.5 (19)	54.1 (20)	89.6 (26)
Average of males without four doubtful cases	782.8 (10)	(18) 673.8	7.3 (13)	8 (12)	8.1 (13)	7.5 (13)	25.8 (17)	27.2 (16)	54.3 (16)	87.5 (22)
Average of fe- males (adults)	765 (2)	(3) 620	6.5 (2)	11 (3)	5 (3)	7 (2)	23.7 (3)	28 (3)	50 (2)	106 (3)

TABLE VII.—DIMENSIONS OF TEETH.

Number of Skull.	Combined lengths of three molar teeth.				Combined lengths of molars and premolars.			
	Upper.		Lower.		Upper.		Lower.	
<i>Males.</i>	Right.	Left.	Right.	Left.	Right.	Left.	Right.	Left.
2101	34	34	39	38	49	49	54	53
2102	32	32	(?)	(?)	46	46	(?)	(?)
2103	31	32	34	35	48	45	50	49
2115	33	32	35	36	51	—	—	—
2117	(?)	32	(?)	(?)	(?)	46	(?)	(?)
2118	29	29	(?)	(?)	42	42	(?)	(?)
2127	(?)	(?)	(?)	(?)	43(?)	(?)	(?)	(?)
2128	31	32	35	33	47	(?)	(?)	(?)
2131	(?)	(?)	(?)	(?)	(?)	(?)	37	(?)
2133	(?)	(?)	(?)	(?)	46(?)	(?)	(?)	(?)
2134	30	(?)	(?)	(?)	44	(?)	(?)	(?)
2137	29	30	31	32	43	44	46	46
2138	32	35	37	37	46	47	52	51
2139	(?)	(?)	35	(?)	44	44	49	49
2140	39	37	40	(?)	50	50	57	(?)
<i>Females.</i>								
2110	(?)	(?)	(?)	32	(?)	(?)	(?)	35
2121	32	31	(?)	(?)	46	46	(?)	(?)
2132	29	30	33	(?)	(?)	(?)	46	(?)
<i>Youths.</i>								
2111	30	31	(?)	(?)	44	43	(?)	(?)
2135	29(?)	(?)	(?)	(?)	42(?)	(?)	(?)	(?)
<i>Average of males.</i>	32 (10)	32·5 (10)	36 (8)	35 (6)	46 (11)	46 (9)	49 (7)	50 (5)
<i>Average of females.</i>	30·5 (2)	30·5 (2)	33 (1)	32 (1)	46 (1)	46 (1)	46 (1)	(?)

PART OF TABLE IX.

Variations of Basal-Bregmatic Height.

Adult well authenticated males from South Australia are considered only.

Cambridge University collection.		All available specimens.	
Modulus 2 units.		Modulus 2 units.	
120-122	1	120-122	1
122-124	2	122-124	3
124-126	3	124-126	3
126-128	0	126-128	1
128-130	0	128-130	1
130-132	3	130-132	3
132-134	0	132-134	3
134-136	1	134-136	1
136-138	1	136-138	2
138-140	1	138-140	1
		140-142	1
Modulus 5 units.		Modulus 5 units.	
115-120	—	120-125	8
120-125	5	125-130	3
125-130	1	130-135	9
130-135	4	135-140	3
135-140	2	140-145	1

TABLE X.—MEASUREMENTS COMPARED WITH
BASI-NASAL LENGTH = 100.

	A.	B.	C.	D.
Cubic capacity	1264·7	1257·4	1222·8	1235·7
Maximum length	187	186·1	186·1	186·3
Ophryo-iniae length	179·8	182·2	182·2	182·1
Ophryo-occipital length	183·8	182·2	182·2	185·3
Maximum breadth	132·3	130·7	129·7	134·7
Bi-asterial breadth	109·1	107·9	107·9	109·5
Bi-stephanic breadth	104	101	100	108·5
Bi-auricular breadth	114·1	113·9	112·9	115·3
Minimum frontal breadth	94·9	97	97	98·9
External biorbital breadth	108·1	106·9	106·9	111·05
Bi-zygomatic breadth	129·8	131·7	129·7	130·5
Bi-malar breadth	116·7	117·8	116·8	121·05
Bi-maxillary breadth	92·9	93·7	92·8	98·9
Jugo-nasal breadth	101	101	100·4	105·3
Naso-mental length	112·1	112·9	111·9	114·2
Ophryo-alveolar length	95·95	97	97	93·7
Naso-alveolar length	67·2	67·3	66·3	71·05
Basi-alveolar length	101	102	102	102
Basi-nasal length	100	100	100	100
Basi-bregmatic length	129·3	129·3	128·7	127·4
Basion-obelion length	125·25	123·8	122·8	124·2
Basion-lambda length	115·15	113·9	112·9	113·7
Basi-iniae length	81·8	80·2	81·2	85·3
Basion-opisthion length	35·35	34·65	34·65	33·7
Breadth of foramen magnum	30·3	29·7	28·7	28·9
Orbital height	33·3	32·7	32·7	35·8
Orbital breadth	43·4	40·6	40·6	41·05
Nasal height	48·5	48·5	49·5	47·4
Nasal breadth	26·3	26·7	26·7	27·4
Palato-maxillary length	58·6	58·4	64·85	58·9
Palato-maxillary breadth	64·6	64·35	64·35	66·3
Arco: Frontal	130·3	128·7	129·7	128·9
" Parietal	129·3	127·7	126·7	127·9
" Occipital superior	65·65	66·3	65·3	58·9
" Occipital inferior	49·5	47·5	47·5	55·3
" Supra-auricular	295·95	304	304	298·9
" Oblique parietal	348·5	341·6	339·6	362·6
" Jugo-nasal	113·13	111·9	111·9	116·8
" Horizontal circumference	514·1	508·9	507·9	517·9
Anterior palatine breadth	29·3	29·7	29·7	29·5
Posterior palatine breadth	40·4	40·6	40·6	41·05
Minimum inter-orbital breadth	25·25	24·75	24·75	27·9
Occipito-spinal length	194·9	193·1	193·1	195·8
Occipito-alveolar length	202	201	202	207·4
Mandible: Symphysial height	31·6	31·7	31·7	35·3
" Coronoid height	59·5	60·4	58·4	62·1
" Condylar height	56·6	57·4	55·4	59·5
" Gonio - symphysial length	80·4	81·2	81·2	84·7
" Intergonial breadth	96·3	97	96	96·8
" Intercoronoid breadth	97·6	97	96	99·5

TABLE X.—MEASUREMENTS COMPARED WITH
BASI-NASAL LENGTH = 100.—*continued.*

	A.	B.	C.	D.
Mandible: Interocondylar breadth, external ..	115.75	116.8	115.8	118.9
" Interocondylar breadth, internal ..	77.9	77.7	78.2	78.9
" Breadth of ascending ramus ..	37.4	37.6	37.6	37.9
" Basal-mental length ..	110.7	111.9	111.9	115.3
" Ophryo-mental length	137.8	138.6	138.6	139.6
Length of parieto - sphenoid suture	(7.8) (9.4)	(7.9) (8.8)	(7.2) (7.9)	(6.8) (11.1)
Length of lacrymo - ethmoid suture	(8) (7.9)	(8.4) (7.7)	(8) (7.4)	(5.3) (7.4)
Height of posterior nares ..	24.3	25.5	25.5	24.8
Breadth of posterior nares ..	27.2	27.2	27	29.5
Length of floor of nasal cavity.	53.1	53.6	53.6	52.6
Least distance between temporal crests	93.8	88.7	86.6	111.6

Column A. All the skulls.

" B. All the males.

" C. Males without four doubtful specimens.

" D. Females.

TABLE X.(a)—COMPARISON OF THE DIMENSIONS REDUCED IN PROPORTION TO
BASI-NASAL LENGTH (AVERAGE) = 100.

Series of skulls.	(12) Andamanese.	Fiji: (6).	Torres Sts.	Australians.
Average value of basi-nasal length	95	104	103.4	101
Cubic capacity	131	144	137.5	122.2
Maximum length	176	188	184.3	186.1
Basi-bregmatic height	136	137	130.9	128.7
Maximum breadth	142	123	125.7	129.7
Minimum frontal breadth	97	98	95.1	97
Bi-auricular breadth	120	112	114.6	112.9
Horizontal circumference	505	512	498.4	507.9
Supra-auricular transverse arc	300	289	288	304 (?)
Frontal arc	127	130	124.6	129.7
Parietal arc	129	138	126.4	126.7
Occipital arc	109	118	114.5	112.8
Length of foramen magnum	85	83	86.7	84.65
Basi-alveolar length	101	103	106.6	102
Bi-zygomatic breadth	132	131	130.8	129.7
Bi-malar breadth	118	115	116	116.9
Interorbital breadth	25	26	24.2	24.75
Orbital breadth	38	38	39.2	40.6
Orbital height	35	32	30.9	33.7
Nasal height	48	47	46.6	49.5
Nasal breadth	25	26	24.9	26.7

Male skulls only
considered.

TABLE XI.

	No. of cases examined.	Occurrence on		
		Right Side.	Left Side.	
Teeth struck out	33	2	1	In all three median upper incisor has been thus lost: the right in natives from New South Wales and Victoria respectively, the left in a South Australian.
<i>Pterion ossides</i>	31	5	4	And in one case only (No. 2137 from N. Territory) on both sides.
<i>Pterygo-spinous ligament</i> ..	17	—	—	Indications in seven instances, in nearly all these on both sides.
<i>Anterior lacerate foramen</i> ..	32	—	1	In seven cases nearly closed on both sides, in one on left side only.
<i>Sphenoid contribution to glenoid fossa</i>	32	2	1	The spine is prolonged thus in twenty-one cases on both sides, in two on right, in one on left only.
<i>Post-condylar foramina</i>	30	5	1	Are pervious in seven cases on both sides, in five on the right, in one on the left only.
<i>Mastoid foramina</i>	30	4	3	Occur ten times on both sides, four on the right and three on the left only.
<i>Vesalian foramina</i>	33	4	7	Occur in twelve cases on both sides, in four on the right, in seven on the left only.
<i>Styloid processes</i>	17	—	—	In ten cases rudimentary, of considerable length in seven cases.
<i>Para-mastoid processes</i>	31	1	1	Very large in one case (male No. 2105).
<i>Tuber maxillare</i>	31	—	—	In eight cases is large, in two is insignificant.
<i>Third occ. condyle</i>	33	—	—	Traces in five cases, especially distinct in No. 2137.
<i>Ext. pterygoid fossae</i>	27	—	—	Are deep in eleven cases, shallow in thirteen.
<i>Ext. pterygoid plates</i>	29	—	—	Project strongly in seventeen, moderately in nine, nearly vertical in three.
<i>Infra-temporal crest</i>	35	—	—	Distinct in twenty-nine cases, usually spiny, sometimes tuberosus.
<i>Post. palatine spine</i>	28	—	—	In seventeen cases rounded, in six obtuse, in four acute, undeveloped in one.
<i>Hamulus lacrymalis</i>	22	9	8	Present in six cases on both sides.
<i>Axes of orbits</i>	34	—	—	Horizontal in eighteen, droop slightly externally in sixteen cases.
<i>Infra-orbital suture</i>	30	12	11	Present on both sides in eleven cases, in two on right only, traces in five other cases.
<i>Fronto. max. suture</i>	24	1	—	One case only.
<i>Div. of malar</i>	30	3	4	On both sides in three cases, on one side (the left) in one case only.
<i>Div. of occipital</i>	37	9	9	In nine cases, and in all on both sides.
<i>Squamo-mastoid angle</i>	38	—	—	Obtuse in thirty cases (in three reaches 180°), acute in six cases (nearly 90° in one), one synostosed.
<i>Parietal foramina</i>	36	15	14	On right alone, eleven; on left alone, ten; on both sides, four; on neither side, eleven.
<i>Spheno-maxillary suture outside orbit</i>	29	11	10	In ten cases on both sides, in one case on right only, absent from seventeen cases.

TABLE XII.—AVERAGES OF INDICES FROM ALL AVAILABLE DATA.

Measurement of Index.	All skulls.	No.	Male skulls.	No.	Female skulls.	No.
Cubic capacity	1246·5	150	1297	97	1148·5	49·
Cephalic index	70·95	214	70·25	111	72·4	53·
Vertical index	71·5	171	71	108	71·4 (F)	52·
Alveolar index	101·1	114	100·4	73	103·1	33
Nasal index	55·1	169	55·75	77	54·9	26
Orbital index	81·3	175	80·2	101	81·9	46
Stephano-zygomatic index	82·05	133	79·8	95	85·6	35
Palato-maxillary index	110·1	63	112	44	110·3	14·
Total facial index	99·4	21	96·2	10	93·6	2
Superior facial index (Broca)	68·9	74	68·5	31	68·2	10·
Superior facial index (Kollmann)	49·9	54	40·9	36	49·8	11·
Gonio-zygomatic index	71·9	40	71·6	25	70·1	7·
Dental index (Flower)	45·3	49	45·1	30	46·5	16·