A CONTRIBUTION TO THE ANTHROPOLOGY OF THE SUDAN.

BY

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[WITH PLATES XVIII, XIX.]

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[With Plates XVIII, XIX.]

Historical.

The accompanying map shows roughly the geographical position of the various tribes mentioned in this paper. They are for the most part scattered over a vast expanse of country stretching from about the centre of the Sudan to the White Nile. A few of them are distributed along the upper waters of the Blue Nile, but the majority dwell along the banks of the main stream south of Khartum, along the Sobat river valley and the numerous headwaters of the White Nile converging from the south and south-west at Lake No.

Little is known of the relations of these tribes to one another, and practically nothing of their individual histories, in spite of the fact that they have been in contact with more or less civilised peoples for the last 4,000 years. Our ignorance is attributed by travellers to the tendency of the Sudanese to break up into small tribes hostile to one another, which leads to so complete an obliteration of common traditions and relationships that the natives are able to give very little information about themselves.

Practically all we know from the natives themselves may be put in a very few words. The Jurawi claim relationship with the Shilluks.[1] The Dinkas also state that the Shilluks and the Jurawi are one, and that the Dinkas and the Nuers are one.[2] The Golo tribe assert[2] that they, the Bongawi and the Jurawi are from the same stock as the Azandeh peoples, chief of which are the Niam-Niam. If these several statements are correct the Jurawi must be a mixed tribe, which is by no means unlikely when we consider the incessant intermixing which must have taken place owing to flight from slave raiders and from conquering tribes. The Burunawi and Bertawi are also said to be connected.[3]

The native traditions afford us little help in determining how long the various tribes have occupied their present positions. The Dinka traditions allude only to mythical origins; they do not give any account of migrations, except in the case of the offshoot dwelling on the White Nile which left the main stock but about 150 years ago. The Shilluks on the other hand must have migrated very long ago, for in their traditions they repeatedly mention their wanderings, while they have a list of twenty-six kings who have reigned over them since they occupied their present home.[4] Of the traditions of the other tribes nothing definite has so far been recorded.

[1] Schweinfurth, *The Heart of Africa* (Eng. Trans.), 1878, vol. i, p. 76.

[2] This information was contained in a letter written to one of us by Major S. Lyle Cummins, R.A.M.C.

[3] Gleichen, *Anglo-Egyptian Sudan*, 1905, vol. i, p. 122.

[4] Gleichen (*op. cit.*), pp. 197–199 ; *cf.* also "Notes on the Sudanese tribes of the White Nile," by Capt. Cummins, *Journ. Roy. Army Med. Corps*, Nov., 1904.

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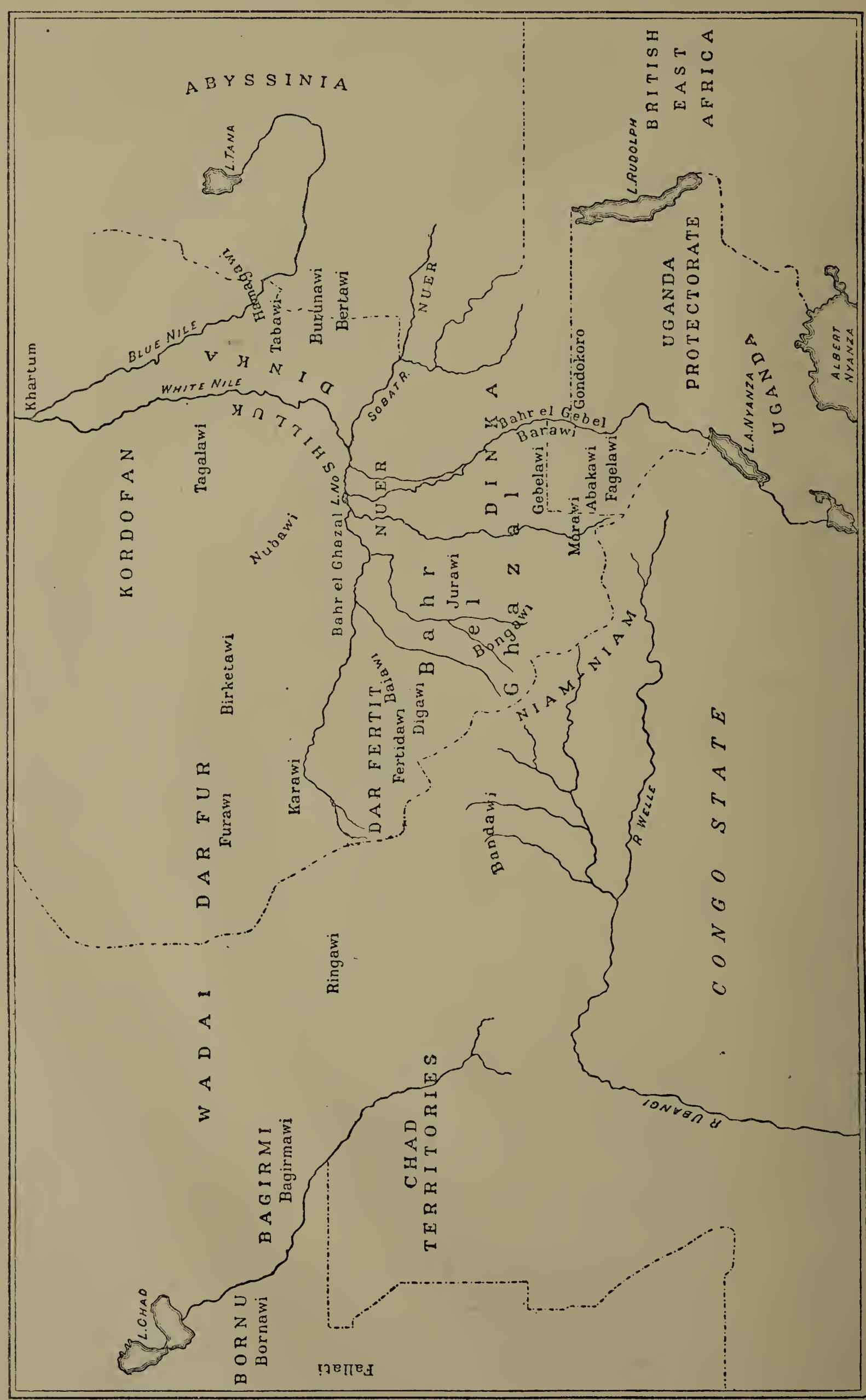
CHARLES MYERS


ABYSSINIA
L.TANA
BLUE NILE
WHITE NILE
Khartum
Hamdab
Tabawi
Burunawi
Bertawi
SHILLUK
DINKA
NUER
SOBAT R.
KORDOFAN
Tagalawi
Nubawi
Birketawi
Bahr el Ghazal
L.No
NUER
DINKA
Bahr el Gebel
Barawi
Gondokoro
Gebelawi
Abakawi
Fagelawi
Murawi
Jurawi
Bongawi
Bahr el Ghazal
NIAM NIAM
DAR FUR
Furawi
Karawi
DAR FERTIT
Fertidawi
Digawi
Baiawi
Bandawi
R WELLE
L.RUDOLPH
BRITISH EAST AFRICA
UGANDA PROTECTORATE
L.NYANZA
UGANDA
ALBERT NYANZA
CONGO STATE
WADAI
Ringawi
CHAD TERRITORIES
R UBANGI
BAGIRMI
Bagirmawi
BORNU
Bornawi
L.CHAD
Fallati

If we turn now to the travellers who have visited the tribes, one fact stands out clearly in all their accounts, and that is the remarkable difference existing between the Nilotic Negroes properly so called (*i.e.*, those living along the White Nile) and the tribes of the southern and western Bahr el Ghazal. Schweinfurth says, "Any traveller who has followed the course of the main sources of the White Nile into the heathen negro countries, and who has hitherto made acquaintance only with Shillooks, Nueir, and Dinka, will, on coming amongst the Bongo, at once recognise the commencement of a new series of races extending far onwards to the south. . . . The jet-black Shillooks, Nueir, and Dinka, natives of the dark alluvial flats, stand out in marked distinction to the dwellers upon the iron-red rocks, who (notwithstanding their diversity in dialect, in habit, or in mode of life) present the characteristics of a connected whole. Of this series the tribes which must be accounted the most important are the Bongo, the Mitto, the Niam-niam, and the Kredy."[1] Of the Bongos he states that they are to be regarded "as hardly removed from the lowest grade of the Brachycephalæ."[2] Keane makes the same distinction between a "black, often very tall and long-headed" type and the other "reddish or ruddy brown, more thick-set, and short-headed."[3] Later, Cummins has drawn the same distinction, partly on sociological, partly on anthropological grounds.[4]

Under these conditions, it is obvious that we must rely chiefly on anthropometric data to find out the relations of the Sudanese tribes to one another. But only within recent years have any such data been available to serve as a basis for definite conclusions; Virchow was the first to obtain exact measurements of the living Sudanese. In 1879, he obtained measurements from a Dinka who was brought to Berlin in a troup of so-called Nubians.[5] In 1889, he measured four more,[6] and in 1895 was able to get full data from a group of men, women, and children (45 in all), who went under the collective name of Dinkas.[7] It was practically impossible to find out the exact tribes to which the different members of the group belonged, but 17 of the 21 whom he measured were dolichocephalic and all but one had a stature over 1·738m. Virchow states that the majority of the adult male Dinkas "do not possess the characteristic negro nose." In 1900, Girard[8] published measurements made upon three Dinkas in Paris. The following figures give the means he obtained for the principal measurements. Stature 1·775m., cephalic index 69·27 (head length 197, head breadth 136mm.), nasal index 91·04, prognathism moderate, head capacity relatively small. By far the most extensive measurements on the tribes of the Sudan were made by Chantre in 1904.[9]

[1] *Loc. cit.*, vol. i, p. 115.
[2] *Ibid.*, p. 116.
[3] *Man Past and Present*, 1899, pp. 76, 77.
[4] *Loc. cit.*, pp. 2–3.
[5] *Verh. Berl. Anthrop. Ges.*, 1879, pp. 388 ff.
[6] *Ibid.*, 1889, p. 545.
[7] *Ibid.*, 1895, p. 148.
[8] *L'Anthropologie*, tome XI, 1900, p. 409 ff.
[9] Chantre, *Recherches Anthropologiques en Egypte*, 1907. Since our paper was sent in for publication the Third Report of the Wellcome Research Laboratories at Khartum has appeared, which includes an account of some valuable anthropometric observations by the late Dr. Pirrie upon some 260 subjects belonging to twelve different tribes of the Sudan. To these results we are unfortunately able to refer only in footnotes.

His classification includes most of the tribes of which measurements are given in this paper, except those of the Blue Nile for which there are no previous data. His classification and data are here given for comparison;

1. Nilotics (Shilluk, Dinka, Nuer).
2. Chadians (Baghirmi, Wadai, Fur).
3. Kanori-Bornu (Bornawi, Hausa).
4. Nubawi (Fertitawi, Tagalawi, Nubawi, Niam-niam, Bongawi, Mombuttu).

	Nilotics.	Chadians.	Kanori-Bornu.	Nubawi.
Cephalic index ...	73·46	75·00	74·48	75·53
Nasal index ...	105·00	104·76	100·00	102·44
Facial index ...	105·64	105·55	109·08	103·96
Stature	1·80m.	1·78m.	1·71m.	1·73m.

Present Material.

The anthropometric and other data published in the present paper were obtained by one of us during the early part of 1902 at Khartum and Omdurman. Few[1] as they are, they seem worthy of publication, considering our present ignorance of Sudanese anthropometry. The conditions under which the work was done, and the methods of procedure, have already been sufficiently described elsewhere.[2] Here we desire only to repeat the expression of our gratitude to the Sirdar and Governor-General for having permitted these observations to be made upon the Sudanese troops under his command, and to the Government Grants Committee of the Royal Society and the British Association for the Advancement of Science for the financial assistance rendered. We would add that all the measurements obtained, together with photographs and other data (shape, colour, texture, etc., of skin, hair, etc.), have been deposited at the Royal Anthropological Institute where they are available for further study.

The more important measurements and indices are given in Tables I and II. The tribes are placed in one or other of these tables according to the number of individuals in each tribe who were measured. Table I obviously affords more reliable information than Table II. To it we shall consequently first turn for an analysis of our data.

[1] The total number of subjects measured is 188, but we have had to eliminate from this number those whose parents do not belong to the same tribe.

[2] C. S. Myers, "Contributions to Egyptian Anthropology," *Journ. Roy. Anth. Inst.*, vol. xxxiii, 1903, pp. 82, 83, vol. xxxv, 1905, p. 82, vol. xxxvi, 1906, pp. 237–258, vol. xxxviii, 1908, pp. 103, 104.

TABLE I.

The following are the chief data for those tribes of which more than five individuals were measured :—

Tribe.	No.	Head Length.	Head Breadth.	Auricular Vertical Radius.	Horizontal Circumference.	Cephalic Index.	Nasal Index.	Radio-gnathic Index.	Upper Facial Index.
Dinka ...	17	191·06	138·70	145·83	538·71	72·71	98·99	111·27	46·23
		(6·92)	(5·47)	(3·95)	(16·75)	(3·58)	(8·53)	(3·44)	(2·71)
		—	—	—	—	± 0·59	± 1·40	—	± 0·44
Shilluk ...	11	193·40	138·54	141·40	548·30	71·70	93·32	110·96	47·12
		(4·71)	(4·14)	(2·15)	(11·20)	(2·93)	(8·95)	(3·27)	(2·39)
		—	—	—	—	± 0·60	± 1·82	± 0·98	± 0·49
Nubawi ...	20	189·15	143·90	142·30	535·00	76·18	101·18	109·89	45·68
		(6·40)	(5·64)	(5·37)	(13·60)	(4·19)	(5·89)	(4·32)	(2·40)
		—	—	—	—	± 0·61	± 0·89	± 0·84	± 0·36
Tagalawi	7	186·00	147·00	142·00	545·75	79·06	103·21	107·15	44·41
		(6·21)	(4·81)	(5·90)	(11·34)	(1·63)	—	—	—
		—	—	—	—	± 0·42	—	—	—
Furawi ...	18	190·70	141·94	140·18	541·60	74·39	102·63	109·90	45·10
		(3·40)	(4·48)	(3·08)	(9·36)	(3·09)	(7·68)	(4·60)	(1·88)
		—	—	—	—	± 0·49	± 1·22	± 0·90	± 0·30
Bertawi ...	8	186·38	141·37	138·00	529·00	75·86	101·29	107·03	46·14
		(5·60)	(3·57)	(2·24)	(2·15)	(3·13)	—	—	—
		—	—	—	—	± 0·74	—	—	—

The figures in the second column give the number of individuals measured in each tribe ; those in the following columns give the mean values for the various measurements ; the figures in brackets express the standard deviations[1] of the means, and those preceded by the sign ± show the probable errors[2] of the means.

[1] The standard deviation (σ) is obtained from the expression $\sigma = \sqrt{\frac{\Sigma \delta^2}{n}}$ where n is the number of individual measurements and $\Sigma \delta^2$ is the sum of the squares of the differences of individual measurements from the mean.

[2] The probable error (p.e.) is found from the expression p.e. $= 0{\cdot}6745 \frac{\sigma}{\sqrt{n}}$. Unfortunately the number of individual measurements is often so small that this constant cannot be satisfactorily calculated.

Table II.

Table II gives a list of the most important data obtained from members of other tribes. As there are mostly only one or two individuals from each tribe, no comparisons are possible, but the data may be useful for future comparison with those obtained by others.

Tribe.	No.	Head Length.	Head Breadth.	Auricular Vertical Radius.	Horizontal Circumference.	Cephalic Index.	Nasal Index.	Radio-gnathic Index.	Upper Facial Index.
Burunawi	1	178·00	138·00	—	—	77·52	105·62	—	41·60
Tabawi ...	1	179·00	131·00	—	—	73·18	94·73	—	43·51
Karawi ...	3	186·30	144·00	149·00	533·50	77·39	95·72	112·46	48·22
Birketawi	2	191·50	143·00	142·00	526·00	74·70	95·85	113·06	46·62
Baiawi ...	2	189·50	144·50	142·00	542·00	76·26	109·25	111·50	47·98
Niam-niam	1	194·00	147·00	138·00	557·00	75·77	102·32	115·16	44·68
Rungawi...	1	197·00	150·00	149·00	561·00	76·15	100·00	104·62	39·04
Nuerawi ...	1	188·00	136·00	136·00	536·00	72·34	80·00	108·18	49·30
Jurawi ...	1	190·00	138·00	—	—	72·64	105·00	—	46·56
Bagirmawi	1	188·00	144·00	140·00	532·00	76·59	93·47	109·70	50·37
Borgawi ...	1	184·00	136·00	131·00	519·00	73·92	95·12	105·82	42·54
Fallati ...	1	197·00	143·00	139·00	—	72·58	107·14	109·16	44·28
Gebelawi	4	191·00	141·50	—	538·00	74·11	101·09	—	47·75
Barawi ...	1	200·00	141·00	142·00	555·00	70·50	97·72	109·26	50·75
Fagelawi...	1	182·00	140·00	139·00	518·00	76·92	100·00	118·75	45·31
Abakawi...	1	196·00	142·00	145·00	554·00	72·45	89·37	112·38	47·88
Morawi ...	1	194·00	140·00	156·00	551·00	72·17	107·14	105·72	44·85
Fertitawi	4	187·00	147·25	137·00	530·00	78·76	103·34	110·08	43·66
Hamagawi	5	180·00	138·80	140·75	518·60	73·22	95·64	103·91	45·10
Bongawi...	4	186·60	142·00	141·30	542·00	76·14	104·36	107·53	48·13
Bandawi...	4	192·50	149·25	145·60	551·00	77·53	103·99	109·59	46·42
Digawi ...	8	190·00	146·38	—	—	77·00	101·55	—	42·35
Bornawi ...	4	191·50	140·75	142·30	539·6	73·52	94·78	107·19	45·67

Cephalic Index.[1]—The Shilluks have the lowest cephalic index (71·70) while the Tagalawi have the highest (79·06), the difference between these being 7·36

[1] For obvious reasons we exclude here from consideration the measurements given in Table II.

units. Now the probable error of the Shilluk index is ± 0·60 while that of the Tagalawi is ± 0·42. Hence the probable error of the difference of the means[1] is ± 0·73, which is far less than a quarter of the difference of the two means (7·36). Again, the difference between the means of the Shilluk and the Nubawi cephalic indices is 4·48, while the probable error of the difference of the two means is ± 0·85, which again is far less than a quarter of the difference of the means. Thirdly, the mean cephalic index for the Shilluks differs from that of the Bertawi by 4·16, while the probable error of the difference of these means is ± 0·96 which is again less than a fourth of the found difference. These three differences, therefore, are with high probability not due to accident.[2]

On the other hand, the difference between the mean cephalic index for the Shilluks and the Dinkas is only 1·01, while the probable error of the difference is ± 0·48; and the difference between the mean cephalic index of the Nubawi and Furawi is 1·79, while the probable error of the difference is ± 0·78. In each of these two cases the probable error of the difference is more than a quarter of the difference of the means. These differences cannot therefore be regarded as necessarily significant.

Comparing the mean cephalic indices of the Tagalawi and the Nubawi, of which the former are said to be a branch, we find that the difference of the two means is 2·88 while the probable error is ± 0·77. The significance of this difference must hence be regarded as doubtful, an attitude which is justified when we come to consider the relations between the two tribes and the scanty figures from which the conclusion is drawn. The mean cephalic indices of the Bertawi and the Nubawi differ by 0·32 while the probable error of the difference is ± 0·96.

From these figures we may legitimately conclude that the Shilluks and Dinkas are appreciably more dolichocephalic than any of the other Sudanese tribes for which we have adequate data; and that the differences between the Furawi and the Nubawi, together with those between the Bertawi and the Nubawi, are probably not significant. The number of subjects measured in other tribes (Table II) is too small to enable us to calculate differences, but we may note that the tribes in Dar Fertit (Fertitawi 78·76, Digawi 77·00) as well as those in the south-west Ghazal district (Bandawi 77·53, Bongawi 76·14) are likewise far more round-headed than the Nilotic Sudanese, while the Nuer and Jur, whose cephalic indices measure 72·34 and 72·64 respectively, agree very closely with their neighbours, the Dinkas and Shilluks.

Nasal Index.—The most divergent values for the mean nasal index in Table I are those for the Shilluks (93·32) and the Tagalawi (103·21). The difference is enormous and cannot be accidental in spite of the few observations made,

[1] The probable error of the difference of two means is the square root of the sum of the squares of the p.e. of the means.

[2] It is generally admitted that a difference acquires significance when it is more than four times its probable error.

especially when we find the nasal indices of the Nubawi and Furawi, who live in the same region as the Tagalawi, to be 101·18 and 102·63 respectively. Next to the Shilluks come their neighbours the Dinkas with a nasal index of 98·99. These indices differ by 5·67, but the probable error of this difference reaches ± 2·30, a value relatively far too high for the difference to be with any probability significant.

The rest of the eastern Sudanese are far more platyrhine than either the Dinkas or the Shilluks. The index of the Nubawi exceeds that of the Shilluks by 7·86 while the probable error of the difference between the two means is only ± 2·02, so that the difference is with some probability significant. On the other hand, in the case of the Nubawi and Furawi these means differ only by 1·45, while the probable error is actually greater than this, ± 1·5. If we compare these results with those obtained for the cephalic index, we find a correlation between less marked dolichocephaly and very marked platyrhiny and between more marked dolichocephaly and less marked platyrhiny.

Upper Facial Index.—This shows no great variation among the different tribes. The lowest is that of the Tagalawi, 44·41; while the highest is that of the Shilluk, 47·12. The values of the upper facial index seem to vary inversely with those of the cephalic and with those of the nasal index, a lower facial index going with a higher cephalic and nasal index, and a higher facial index with a lower cephalic and nasal index. At the one extreme we have the dolichocephalic, less platyrhine, leptoprosopic Shilluk; at the other the mesaticephalic, more platyrhine, chamaeprosopic Tagalawi.

Radio-gnathic Index.—This index expresses the relation between the auriculo-alveolar radius and the auriculo-nasal radius, a not very satisfactory measurement.[1]

It is curious to find that the Shilluks and the Dinkas, though having narrower noses and longer faces than the Furawi and the Nubawi, are not less but perhaps more prognathous. In Table I the Bertawi have the lowest index, 107·03, while in Table II the Hamagawi, of which tribe the Bertawi are thought to be a branch, have an index as low as 103·91, which value is actually reached by the natives of Upper Egypt.[2] From our study of the cephalic, nasal, upper facial, and gnathic indices it seems probable that the tribes living on the banks of the Nile and its tributaries (*e.g.*, the Shilluks and the Dinkas) are more dolichocephalic, less platyrhine, more leptoprosopic, and perhaps more prognathous, than the south-western Bahr el Ghazal tribes (Bongawi, Fertitawi, Niam-niam), the tribes of Dar Fur and Dar Nuba, or those of the Blue Nile.

Stature.—In the following table the average stature of the chief tribes is given, with the number measured in each tribe:—

[1] To make the index significant it is necessary to know the size of the angle enclosed by the two linear measurements on which the index is based. See *Man*, vol. iii, 1903–4, pp. 12, 13.

[2] *Cf. Journ. Ry. Anth. Inst.*, 1906, vol. xxxvi, p. 239.

TABLE III.

Tribe.	No.	Stature.	Tribe.	No.	Stature.
Shilluks	11	1·777 m.	Bertawi	8	1·666 m.
Nubawi	20	1·735	Tagalawi ...	7	1·659
Dinkas	17	1·727	Furawi	18	1·653
Bandawi	4	1·701	Fertitawi ...	4	1·638
Bongawi	4	1·691	Niam-niam ...	1	1·627
Hamagawi ...	5	1·677			

We note the relative tallness of the Dinkas, Shilluks and Nubawi as compared with the Blue Nile tribes and the tribes of the S.W. Ghazal.[1]

As far as these various data permit us to draw any conclusions it would seem that the Nubawi and Furawi with their respective branches, the Tagalawi and Birketawi, are very closely related, a conclusion to which Keane was also drawn in his study of the Sudanese tribes. In fact he says,[2] "from Kordofan . . . . they (*i.e.*, the Nubawi) spread west to Dar Fur and Wadai where they are now represented by the Furs, Kunjaras, and the Tynjurs." From our data it would also appear that the southern tribes are relatively broad-headed, *e.g.*, the Bongawi have a cephalic index of 76·14, the Niam-niam one of 75·77, the Fertitawi one of 78·76, and as Table III shows are shorter than the true Nilotic Negroes.[3] In fact, it seems that the extreme dolichocephaly which is usually associated with the Sudanese tribes is confined to the region of the White Nile (and perhaps to the S.E. Ghazal), the tribes further south and in Dar Nuba and Dar Fur being more or less mesati-cephalic.

For comparison the tribes have been arranged in Table IV according to their habitats, and from this the same general results *inter alia* appear.

[1] Dr. Pirrie's measurements of the stature of the Shilluks confirm our results, in contrast to Schweinfurth's statement (*op. cit.* vol. i, p. 17) that they are of "very moderate" height. On the other hand, according to Dr. Pirrie, the Nubawi are not so tall, their position in his table being close to the Furawi, whom they closely resemble in other physical measurements.

[2] *Man Past and Present*, 1899, p. 73.

[3] Excluding tribes in which only one representative was measured, we find a remarkable agreement between the late Dr. Pirrie's results and our own, so far as the cephalic index is concerned thus :

	Dinkas	Shilluks	Nubawi	Furawi	Fertitawi	Bongawi	Gebelawi
Dr. Pirrie's results	72·8	71·4	75·9	75·0	78·3	76·7	76·3
Our Own results	72·7	71·7	76·2	74·4	78·8	76·1	74·1

The other data, however, often show considerable divergence, due, no doubt, in great part to individual differences in taking the same measurements.

Table IV.—I. Nilotics.

Tribe.	No.	C.I.	N.I.	U.F.I.	R.G.I.
Dinkas	17	72·71	98·99	46·23	111·27
Shilluks	11	71·70	93·32	47·12	110·96
Nuers	1	72·34	80·00	49·30	108·18
Jurs	1	72·64	105.00	46·56	—
Average of tribes	...	72·35	94·32	47·30	110·14

Table IV.—II. Dar Fur and Dar Nuba.

Tribe.	No.	C.I.	N.I.	U.F.I.	R.G.I.
Nubawi	20	76·18	101·18	45·68	109·89
Birketawi ...	2	74·70	95·85	46·62	113·06
Tagalawi	7	79·06	103·21	44·41	107·15
Furawi	18	74·39	102·63	45·10	109·90
Karawi	3	77·39	95·72	48·22	112·46
Average of tribes	...	76·34	99·72	46·01	110·49

Table IV.—III. Dar Fertit and S.W. Bahr el Ghazal.

Tribe.	No.	C.I.	N.I.	U.F.I.	R.G.I.
Fertitawi... ...	4	78·76	103·34	43·66	110·08
Rungawi	1	76·15	100·00	39·04	104·62
Digawi	8	77·00	101·55	42·35	—
Baiawi	2	76·26	109·25	47·98	111·50
Bongawi	4	76·14	104·36	48·13	107·53
Bandawi	4	77·53	103·99	46·42	109·59
Niam-niam ...	1	75·77	102·32	44·68	115·16
Average of tribes	...	76·80	103·54	44·61	109·74

TABLE IV.—IV. S.E. BAHR EL GHAZAL.

Tribe.	No.	C.I.	N.I.	U.F.I.	R.G.I.
Morawi	1	72·17	107·14	44·85	105·72
Abakawi	1	72·45	89·37	47·88	112·38
Fagelawi	1	76·92	100·00	45·31	118·75
Barawi	1	70·50	97·72	50·75	109·26
Gebelawi	4	74·11	101·09	47·75	—
Average of tribes	...	73·23	99·06	47·31	111·53

TABLE IV.—V. BLUE NILE TRIBES.

Tribe.	No.	C.I.	N.I.	U.F.I.	R.G.I.
Hamagawi ...	5	73·22	95·64	45·10	103·91
Tabawi	1	73·18	94·73	43·51	—
Bertawi	8	75·86	101·29	46·14	107·03
Burunawi... ...	1	77·52	105·62	41·60	—
Average of tribes	...	74·95	99·32	44·09	105·48

TABLE IV.—VI. LAKE CHAD TRIBES.

Tribe.	No.	C.I.	N.I.	U.F.I.	R.G.I.
Borgawi	1	73·92	95·12	42·54	105·82
Bornawi	4	73·52	94·78	45·67	107·196
Fallati	1	72·58	107·14	44·28	109·16
Bagirmawi ...	1	76·59	93·47	50·37	109·70
Average of tribes	...	74·15	97·62	45·71	107·97

Non-numerical characters.[1]—One or two interesting points may be mentioned in connection with these data. The eyes of all the individuals measured are very dark brown, and in many cases there is a ring of pigment more or less complete around the iris. The eyes are as a rule large and among the Shilluks and Nubawi there are one or two cases of oblique axes. The distance between the two eyes is often considerable, and as the photographs show, this is more marked when the nose root is depressed.

The hair on the head is in all cases spiral and black, but the White Nile tribes are smoother faced than the western Bahr el Ghazal tribes. This comes out very clearly from the photographs.

The shape of the head from above and behind varies in different tribes, *e.g.*, of the Shilluks and the Dinkas only 27·3 per cent. and 23·3 per cent. respectively have ellipsoid heads when viewed from above, while of the Nubawi and the Furawi 42·5 per cent. and 46·9 per cent. have that shape. The Dinkas have for the most part extremely ovoid heads.

The forehead varies considerably in prominence, in all of the tribes the proportion of markedly retreating and markedly prominent foreheads being approximately equal for the different tribes. The chin tends to be feeble among the Bertawi, the Shilluks, and the Dinkas, while the Furawi have a large percentage of moderate chins (67·6 per cent.) and the four Hamagawi measured also have good chins. The Shilluks have by far the thickest lips, as many as 45 per cent. being classed as "negroid." The Furawi on the other hand are comparatively thin-lipped, 17 per cent. being classed as negroid, 56 as thick, while 27 per cent. are "medium." The other tribes have thick lips, but not the extreme "negroid" form.

The skin colour varies from very dark brown, almost black, to a bright copper tinge, but these differences are found in one and the same tribe.

General Summary.

1. The tribes measured may be divided geographically into six groups:—(i) Tribes of the White Nile (Nilotics), *e.g.*, Dinkas, Shilluks, Jurs; (ii) Tribes of Dar Nuba and Dar Fur, *e.g.*, Nubawi, Tagalawi, Furawi, Karawi; (iii) Tribes of Dar Fertit and the S.W. Bahr el Ghazal, *e.g.*, Fertitawi, Digawi, Niam-niam; (iv) Tribes of the S.E. Bahr el Ghazal, *e.g.*, Morawi, Barawi, Gebelawi; (v) Tribes of the Blue Nile, *e.g.*, Hamagawi, Bertawi, Burunawi; (vi) Tribes of Lake Chad, *e.g.*, Bornawi, Fallati, Bagirmawi.

2. This geographical classification serves, on the whole, as a useful basis for deductions from anthropometric material.

[1] The present material, drawn from regiments quartered at Khartum and Omdurman, is obviously unsuited to the study of tribal peculiarities of *coiffure*, dental extraction, cutaneous scarring and the like. Of the scars met with on the face, we may observe that some had been made "against illness," a few were declared to be the custom of the tribe, but the majority had been inflicted by Arab slave-masters of the past, the mark apparently varying with the tribe of the Arab slave-owner.

3. There is a striking agreement in the physical characters of the first and fourth and in the fifth and sixth of these groups; and there is a well-marked contrast in the physical characters of the first and second groups, and in those of the third and fourth groups.

4. The cephalic index varies in different parts of the Sudan, the White Nile tribes and those of the S.E. Ghazal being most dolichocephalic, while the tribes of Dar Fur, Dar Nuba, Dar Fertit and those in the S.W. Ghazal are mesaticephalic. The tribes of the Blue Nile and of Lake Chad are intermediate between these extremes.

5. The nasal index varies as a rule with the cephalic index, a relatively narrower nose going with a narrower head and a relatively broader nose with a broader head.

6. The upper facial index does not vary much, but it tends to decrease as the cephalic index increases, that is, the face tends to be broader when the head is broader.

7. The radio-gnathic index is highest among the tribes of the White Nile, lowest among the tribes of the Blue Nile and of Lake Chad.

8. The stature decreases from north to south. The tribes of the Blue Nile are relatively short.

9. The colour of the eyes and the type of hair remain constant throughout the Sudanese tribes.

10. No great differences in skin colour among the different tribes appear to exist.

11. The head is far more ellipsoid among the White Nile tribes than among any of the other tribes.

12. The forehead, chin, and lips vary considerably in all the tribes.

Appendix.

The following tables give the more important measurements. A complete list of the data sought for has been already published[1]; it need not be repeated here :—

[2] *Journal Anthrop. Inst.*, 1903, vol. xxxiii, pp. 82, 83; 1906, vol. xxxvi, p. 237.

List of

Tribe.	Subject Number.	3	4	5	6	7	8	9	10	11	12	13	14	15
Abakawi ...	2134	1798	1656	1554	—	—	—	—	—	—	142	196	68	113
Bagirmawi ...	2022	—	—	—	—	—	—	—	—	—	144	188	67	114
Baiawi ...	2047	—	—	—	—	—	—	—	—	—	142	190	64	111
„ ...	2105	1700	—	—	—	—	—	—	—	—	147	189	67	116
Bandawi ...	2104	1722	—	—	—	—	—	—	—	—	147	188	60	106
„ ...	2127	—	—	—	—	—	—	—	—	—	150	193	—	121
„ ...	2160	1720	—	—	—	—	—	—	—	—	144	191	70	117
„ ...	2173	1662	—	—	—	—	—	—	—	—	156	198	59	103
Barawi ...	2073	1805	1662	1565	1490	1130	863	1050	505	62	141	200	68	116
Birketawi ...	2043	1673	1550	1445	1380	1063	790	920	470	65	140	186	68	113
„ ...	2184	1723	—	—	—	—	—	—	—	—	146	197	58	107
Bertawi ...	2005	—	—	—	—	—	—	—	—	—	137	195	62	108
„ ...	2008	—	—	—	—	—	—	—	—	—	140	183	60	107
„ ...	2031	1745	—	—	—	—	—	—	—	—	138	189	67	109
„ ...	2054	—	—	—	—	—	—	—	—	—	141	193	65	115
„ ...	2060	—	—	—	—	—	—	—	—	—	142	186	61	104
„ ...	2078	—	—	—	—	—	—	—	—	—	139	176	57	104
„ ...	2136	1660	1525	1430	—	—	—	—	—	—	147	185	58	110
„ ...	2177	1593	—	—	—	—	—	—	—	—	147	184	68	116
Bongawi ...	2029	—	—	—	—	—	—	—	—	—	138	187	64	110
„ ...	2108	—	—	—	—	—	—	—	—	—	143	179	67	112
„ ...	2110	1746	1606	1510	1405	1070	785	930	478	53	145	194	65	116
„ ...	2123	1636	—	—	—	—	—	—	—	—	—	—	—	—
Borgawi ...	2027	1504	—	—	—	—	—	—	—	—	136	184	57	104
Bornawi ...	2018	—	—	—	—	—	—	—	—	—	144	186	61	107
„ ...	2023	—	—	—	—	—	—	—	—	—	143	197	60	108
„ ...	2074	1558	1428	1340	1275	983	740	855	432	55	134	190	57	104
„ ...	2169	1763	—	—	—	—	—	—	—	—	142	193	64	110
Burunawi ...	2007	—	—	—	—	—	—	—	—	—	138	178	55	99
Digawi ...	2024	—	—	—	—	—	—	—	—	—	150	194	61	102
„ ...	2036	—	—	—	—	—	—	—	—	—	148	195	65	104
„ ...	2041	—	—	—	—	—	—	—	—	—	133	178	56	105
„ ...	2048	—	—	—	—	—	—	—	—	—	143	183	66	112
„ ...	2122	1656	1505	1416	1322	1000	745	888	460	50	162	201	65	110
„ ...	2161	1646	—	—	—	—	—	—	—	—	143	187	56	101
„ ...	2167	1646	—	—	—	—	—	—	—	—	145	189	66	114

MEASUREMENTS.

16	17	19	22	24	25	26	27	28	29	30	31	32	33	34	35	44
111	142	104	106	32	42	47	117	554	347	145	134	105	118	137	125	—
110	133	103	101	33	43	46	113	532	334	140	125	103	113	122	123	—
113	134	93	105	—	49	43	120	—	—	145	131	106	116	123	120	—
108	139	105	—	41	46	44	129	542	340	139	122	103	117	128	123	—
106	139	111	99	35	47	42	111	536	352	145	125	100	111	125	126	—
118	146	110	—	—	38	45	—	—	—	—	—	—	—	—	—	—
109	132	107	107	37	46	49	123	—	—	146	133	110	118	140	122	1820
112	137	98	109	38	44	35	121	566	375	146	125	105	116	124	126	1735
113	134	98	99	34	43	44	117	555	342	142	128	108	118	131	126	1885
109	136	98	102	37	41	46	117	526	335	138	131	108	120	128	116	1810
104	134	102	106	36	40	39	121	—	—	146	128	100	115	128	128	1800
—	133	98	101	—	40	44	114	—	—	—	—	—	—	—	—	—
108	127	104	96	—	43	40	113	—	—	—	—	—	—	—	—	—
122	133	105	102	35	42	44	117	528	326	138	129	105	114	124	126	1805
105	137	109	101	38	38	45	114	—	—	139	132	104	106	124	—	—
104	131	103	—	—	41	42	—	—	—	135	125	98	110	122	118	—
121	133	105	101	37	43	36	111	—	—	138	129	102	106	118	118	—
117	142	115	107	35	45	36	113	532	347	142	123	101	113	140	117	—
114	144	103	108	37	36	40	120	527	326	136	127	102	110	128	111	1690
112	132	105	110	36	47	44	119	532	337	144	132	105	117	129	113	—
110	132	98	98	37	45	48	115	—	—	139	124	105	113	129	113	—
113	144	113	109	38	45	40	125	552	355	141	138	113	117	138	113	1880
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1780
106	134	100	100	33	39	41	112	519	315	131	120	103	109	123	118	—
104	129	89	101	37	38	43	108	533	329	139	124	103	109	124	120	—
105	135	102	104	39	40	44	113	553	345	149	133	105	112	126	129	—
104	132	103	102	36	38	41	115	533	325	139	122	99	108	122	120	1620
112	134	—	—	—	45	42	—	—	—	—	—	—	—	—	—	—
103	132	106	—	—	41	39	—	—	—	—	—	—	—	—	—	—
125	145	109	108	36	44	41	121	563	362	155	137	111	113	130	122	—
103	134	97	101	37	41	43	119	—	—	—	—	—	—	—	—	—
—	128	—	—	—	40	37	—	—	—	—	—	—	—	—	—	—
119	138	94	103	—	41	44	117	—	—	145	129	105	120	128	123	—
115	147	109	108	38	48	47	122	588	376	154	135	106	119	123	134	1815
114	141	99	105	35	42	37	121	—	—	—	122	99	111	127	119	1780
108	137	101	104	40	39	43	120	—	—	—	—	—	—	—	—	—

List of Measure-

Tribe.	Subject number.	3	4	5	6	7	8	9	10	11	12	13	14	15
Digawi ...	2186	—	—	—	—	—	—	—	—	—	147	193	68	116
Dinkawi ...	2002	—	—	—	—	—	—	—	—	—	133	187	61	111
,, ...	2019	—	—	—	—	—	—	—	—	—	133	199	60	108
,, ...	2045	1637	—	—	—	—	—	—	—	—	138	192	60	106
,, ...	2063	1768	—	—	—	—	—	—	—	—	146	176	61	108
,, ...	2069	—	—	—	—	—	—	—	—	—	133	189	58	107
,, ...	2075	—	—	—	—	—	—	—	—	—	150	196	65	110
,, ...	2102	1713	—	—	—	—	—	—	—	—	148	200	70	119
,, ...	2144	—	—	—	—	—	—	—	—	—	140	192	65	114
,, ...	2150	1775	—	—	—	—	—	—	—	—	136	193	60	106
,, ...	2151	1763	1626	1527	1440	1090	798	980	520	58	136	190	67	115
,, ...	2153	1725	1583	1493	1433	1087	805	964	500	58	140	191	65	117
,, ...	2154	1638	—	—	—	—	—	—	—	—	141	181	53	92
,, ...	2156	1705	—	—	—	—	—	—	—	—	137	196	53	96
,, ...	2163	1761	—	—	—	—	—	—	—	—	133	184	59	104
,, ...	2170	1713	1572	1495	1394	1073	812	936	475	48	131	183	57	100
,, ...	2175	1807	—	—	—	—	—	—	—	—	141	203	67	116
,, ...	2185	—	—	—	—	—	—	—	—	—	143	196	58	101
Jurawi ...	2119	1809	—	—	—	—	—	—	—	—	138	190	61	104
Fagelawi ...	2077	1670	—	—	—	—	—	—	—	—	140	182	58	94
Fallati ...	2066	—	—	—	—	—	—	—	—	—	143	197	62	109
Fertitawi ...	2044	1582	—	—	—	—	—	—	—	—	146	182	58	102
,, ...	2137	—	—	—	—	—	—	—	—	—	152	188	60	106
,, ...	2146	—	—	—	—	—	—	—	—	—	146	189	59	105
,, ...	2152	1694	—	—	—	—	—	—	—	—	145	189	67	116
Furawi ...	2004	—	—	—	—	—	—	—	—	—	149	192	58	104
,, ...	2025	—	—	—	—	—	—	—	—	—	140	188	59	104
,, ...	2065	1642	—	—	—	—	—	—	—	—	143	183	60	106
,, ...	2076	1629	1495	1400	1332	1020	755	880	450	65	143	186	59	106
,, ...	2103	1653	—	—	—	—	—	—	—	—	144	191	60	104
,, ...	2115	1672	1531	1450	1351	1050	780	885	450	67	151	190	60	106
,, ...	2116	1665	—	—	—	—	—	—	—	—	141	191	64	108
,, ...	2120	1650	1518	1426	1327	1020	740	905	465	60	136	195	61	110
,, ...	2141	—	—	—	—	—	—	—	—	—	143	195	64	108
,, ...	2145	—	—	—	—	—	—	—	—	—	141	197	65	111
,, ...	2147	1669	1538	1457	—	—	—	—	—	—	133	191	58	101
,, ...	2155	1727	1573	1490	1393	1090	797	927	488	58	139	194	61	112

MENTS—*continued.*

16	17	19	22	24	25	26	27	28	29	30	31	32	33	34	35	44
112	140	104	107	36	48	47	120	—	—	—	—	—	—	—	—	—
108	131	98	94	34	41	39	105	525	345	151	136	103	111	128	117	—
118	130	103	101	32	39	41	114	—	—	152	135	104	115	121	134	—
106	130	96	99	36	42	39	111	537	347	145	125	100	113	117	127	1725
108	135	97	99	33	39	42	107	—	—	138	120	99	113	128	111	1890
103	126	104	—	—	40	38	—	—	—	—	—	—	—	—	—	—
116	138	93	102	34	40	42	120	—	—	148	131	108	118	123	120	—
116	138	105	111	40	39	45	129	565	352	145	131	110	118	123	130	—
109	133	—	103	32	38	45	119	—	—	—	—	—	—	—	—	—
101	132	105	99	35	43	40	110	—	—	148	127	102	115	126	123	1930
109	134	91	98	33	45	43	113	528	333	141	123	104	124	135	115	1928
107	134	96	107	32	41	43	113	540	332	143	129	103	117	132	123	1870
96	125	95	95	31	41	37	105	—	—	—	—	—	—	—	—	—
107	135	96	103	32	40	36	120	—	—	—	—	—	—	—	—	—
103	127	99	104	34	37	37	111	—	—	147	127	100	110	116	119	1865
101	126	98	98	31	39	39	115	516	322	143	128	98	104	124	117	1830
116	139	99	107	34	43	44	122	560	352	149	133	104	116	132	129	1880
101	133	99	—	—	35	42	—	—	—	—	—	—	—	—	—	—
104	131	91	—	—	42	40	—	—	—	—	—	—	—	—	—	—
110	128	85	96	33	38	38	110	518	335	139	123	96	114	126	120	1700
109	140	98	101	38	45	42	115	—	—	139	131	109	119	128	120	—
114	139	97	100	36	42	36	114	530	337	137	130	106	115	122	110	1655
114	141	—	—	—	42	40	—	—	—	—	—	—	—	—	—	—
114	140	103	—	—	44	42	—	—	—	—	—	—	—	—	—	—
115	139	105	101	—	40	46	114	—	—	—	125	103	115	134	123	1910
119	133	101	98	34	47	40	113	560	350	—	—	—	—	—	—	—
105	131	101	97	31	38	39	109	532	332	138	128	106	111	125	127	—
107	135	96	99	31	40	42	113	—	—	139	121	102	119	130	114	—
106	136	101	100	32	36	39	111	532	340	144	127	100	108	125	114	1770
110	130	100	102	34	41	40	118	546	335	138	128	102	118	128	125	—
116	142	102	107	40	47	42	123	552	337	147	128	104	111	121	127	1710
112	138	108	—	—	44	39	—	—	—	—	—	—	—	—	—	—
110	135	99	97	35	43	40	113	541	342	143	132	106	112	124	123	1785
120	141	108	111	37	42	44	125	—	—	—	—	—	—	—	—	—
105	133	103	97	34	38	42	111	—	—	—	—	—	—	—	—	—
109	132	95	105	36	38	38	116	531	325	138	125	103	113	119	116	1785
112	132	106	106	34	39	39	116	544	—	—	122	102	109	125	120	1787

List of Measure-

Tribe.	Subject Number.	3	4	5	6	7	8	9	10	11	12	13	14	15
Furawi ...	2158	1650	1522	1432	1352	1063	783	888	453	58	137	190	61	104
,, ...	2168	1555	—	—	—	—	—	—	—	—	140	186	61	100
,, ...	2181	1740	—	—	—	—	—	—	—	—	143	191	65	113
,, ...	2182	1630	—	—	—	—	—	—	—	—	143	189	65	112
,, ...	2183	1605	—	—	—	—	—	—	—	—	150	194	59	101
,, ...	2188	—	—	—	—	—	—	—	—	—	139	191	61	100
Gebelawi ...	2017	—	—	—	—	—	—	—	—	—	132	192	63	106
,, ...	2051	—	—	—	—	—	—	—	—	—	149	190	63	109
,, ...	2148	—	—	—	—	—	—	—	—	—	142	191	70	113
,, ...	2164	—	—	—	—	—	—	—	—	—	143	191	62	101
Hamagawi ...	2067	1723	—	—	—	—	—	—	—	—	143	175	62	107
,, ...	2109	1689	—	—	—	—	—	—	—	—	137	178	61	107
,, ...	2129	1717	—	—	—	—	—	—	—	—	136	190	58	104
,, ...	2143	1682	1543	1453	1368	1035	758	925	470	50	141	184	60	109
,, ...	2166	1575	—	—	—	—	—	—	—	—	137	173	64	109
Karawi ...	2114	1741	1589	1490	1385	1067	790	923	487	53	141	194	67	110
,, ...	2117	1718	—	—	—	—	—	—	—	—	145	185	66	113
,, ...	2172	1590	1450	1345	1275	975	763	827	432	58	146	180	71	121
Morawi ...	2133	1745	1603	1522	1430	1090	790	980	512	60	140	194	61	108
Nubawi ...	2003	—	—	—	—	—	—	—	—	—	144	197	61	108
,, ...	2006	—	—	—	—	—	—	—	—	—	149	198	67	110
,, ...	2028	—	—	—	—	—	—	—	—	—	138	187	60	103
,, ...	2034	—	—	—	—	—	—	—	—	—	151	177	59	107
,, ...	2050	—	—	—	—	—	—	—	—	—	146	190	65	111
,, ...	2056	1776	1642	1558	1438	1087	815	1000	551	63	139	194	67	114
,, ...	2057	—	—	—	—	—	—	—	—	—	139	188	61	109
,, ...	2059	—	—	—	—	—	—	—	—	—	150	193	63	107
,, ...	2062	1738	—	—	—	—	—	—	—	—	138	183	59	108
,, ...	2070	—	—	—	—	—	—	—	—	—	157	181	63	108
,, ...	2071	—	—	—	—	—	—	—	—	—	142	202	61	107
,, ...	2072	1693	1550	1458	1390	1080	807	930	468	60	151	195	58	103
,, ...	2079	—	—	—	—	—	—	—	—	—	143	194	64	110
,, ...	2100	1803	1670	1576	1460	1143	858	995	520	53	144	182	63	108
,, ...	2111	1740	—	—	—	—	—	—	—	—	142	186	67	117
,, ...	2124	1747	—	—	—	—	—	—	—	—	132	188	59	106
,, ...	2132	1615	1473	1384	—	—	—	—	—	—	144	189	64	112
,, ...	2174	1643	—	—	—	—	—	—	—	—	144	179	66	107
,, ...	2180	1745	—	—	—	—	—	—	—	—	146	191	67	114

MENTS—*continued.*

16	17	19	22	24	25	26	27	28	29	30	31	32	33	34	35	44
109	132	98	101	30	41	38	110	537	323	136	128	102	115	126	118	1765
106	132	93	—	—	41	39	—	—	—	—	—	—	—	—	—	—
114	139	103	106	33	43	44	117	—	—	138	123	104	121	136	121	1900
113	141	103	110	39	41	43	127	—	—	140	122	108	122	132	117	1730
111	147	102	104	38	43	38	118	—	—	141	133	111	114	129	128	1720
106	134	107	104	35	42	40	120	—	—	—	—	—	—	—	—	—
—	127	—	—	—	38	41	—	—	—	—	—	—	—	—	—	—
106	145	103	107	—	40	43	121	—	—	—	—	—	—	—	—	—
107	132	95	100	35	49	45	111	538	350	—	—	—	—	—	—	—
111	138	102	106	35	45	41	119	—	—	—	—	—	—	—	—	—
104	131	99	96	31	42	46	105	—	—	144	128	97	99	109	124	—
117	137	107	102	34	40	44	120	500	324	138	123	105	113	128	110	—
115	141	107	105	39	41	38	114	530	340	140	130	104	110	128	125	1910
112	132	108	106	34	37	42	121	526	335	141	131	107	105	123	115	1805
113	136	112	100	34	43	43	—	—	—	—	127	106	107	116	111	1735
113	140	99	102	37	42	47	125	542	365	154	135	108	120	130	132	1825
119	140	100	—	—	44	45	—	—	—	—	—	—	—	—	—	—
109	143	103	109	36	42	42	119	525	348	144	124	102	116	124	125	1655
110	136	100	105	37	45	42	118	551	360	156	139	105	111	128	131	1900
115	139	103	101	36	45	42	118	556	351	—	—	—	—	—	—	—
120	136	104	—	—	41	45	—	—	—	—	—	—	—	—	—	—
111	132	93	102	—	45	40	116	—	—	—	—	—	—	—	—	—
104	136	99	105	37	42	42	118	527	343	145	128	103	109	120	117	—
119	146	108	109	—	45	47	122	—	—	139	129	109	115	120	126	—
112	138	102	95	33	45	44	105	540	340	141	130	105	127	138	122	1920
109	134	100	95	31	41	40	109	—	—	145	127	99	107	118	127	—
115	140	103	—	—	45	45	—	—	—	—	—	—	—	—	—	—
102	131	94	102	31	42	41	112	—	—	147	130	107	113	117	118	1800
120	142	105	103	35	45	46	116	—	—	145	126	104	112	125	123	—
109	136	100	100	36	40	42	118	—	—	135	132	108	114	131	123	—
123	147	98	109	38	46	41	123	551	345	148	129	107	116	129	126	1815
123	140	103	—	—	44	44	114	—	—	144	129	105	119	139	123	—
111	141	96	100	31	45	45	117	528	343	143	129	103	112	124	113	1880
113	135	—	98	34	46	44	113	531	—	—	127	105	115	137	125	—
108	132	93	99	31	45	41	112	526	325	138	123	98	111	123	121	1850
111	137	108	105	35	39	40	118	543	350	150	132	106	117	128	118	—
103	131	106	100	32	39	42	122	513	330	—	—	—	—	—	—	1715
116	143	103	107	35	40	42	124	—	—	130	119	103	119	139	116	1900

List of Measure-

Tribe.	Subject Number.	3	4	5	6	7	8	9	10	11	12	13	14	15
Nubawi ...	2187	—	—	—	—	—	—	—	—	—	139	189	64	110
Nuerawi ...	2101	1788	1660	1575	1480	1133	836	995	528	58	136	188	70	111
Niam-niam	2101	1627	1497	1403	1325	1010	747	893	450	50	147	194	63	106
Ringawi ...	2033	1715	—	—	—	—	—	—	—	—	150	197	57	106
Shilluks ...	2010	—	—	—	—	—	—	—	—	—	134	188	62	107
„ ...	2012	—	—	—	—	—	—	—	—	—	134	196	59	105
„ ...	2020	—	—	—	—	—	—	—	—	—	142	192	62	108
„ ...	2061	1872	1727	1633	1555	1182	865	1087	558	62	143	201	70	117
„ ...	2064	1738	—	—	—	—	—	—	—	—	139	194	59	103
„ ...	2138	1686	1553	1470	—	—	—	—	—	—	136	192	62	106
„ ...	2140	—	—	—	—	—	—	—	—	—	141	200	66	104
„ ...	2149	1803	1662	1558	1453	1132	818	998	510	60	135	198	67	119
„ ...	2162	1786	—	—	—	—	—	—	—	—	146	186	64	115
„ ...	2165	—	—	—	—	—	—	—	—	—	133	192	64	105
„ ...	2189	—	—	—	—	—	—	—	—	—	141	188	62	104
Tabawi ...	2171	—	—	—	—	—	—	—	—	—	131	179	57	97
Tagalawi ...	2001	—	—	—	—	—	—	—	—	—	148	185	63	110
„ ...	2015	—	—	—	—	—	—	—	—	—	146	185	61	109
„ ...	2026	—	—	—	—	—	—	—	—	—	156	198	57	107
„ ...	2106	—	—	—	—	—	—	—	—	—	140	188	60	109
„ ...	2121	1721	1585	1482	1410	1085	822	945	482	52	149	188	69	114
„ ...	2125	1597	—	—	—	—	—	—	—	—	142	176	—	95
„ ...	2126	—	—	—	—	—	—	—	—	—	148	182	61	101

MENTS—*continued.*

16	17	19	22	24	25	26	27	28	29	30	31	32	33	34	35	44
113	140	96	111	—	45	43	—	—	—	—	—	—	—	—	—	—
111	142	102	105	37	36	45	125	536	332	136	134	110	119	132	113	1940
114	141	115	101	31	44	43	113	557	330	138	125	99	114	128	119	1800
113	146	108	106	35	41	41	121	561	363	149	135	108	113	133	118	1775
104	127	91	—	—	33	42	—	—	—	—	—	—	—	—	—	—
121	135	102	106	33	45	41	116	—	—	—	—	—	—	—	—	—
120	140	105	106	36	41	45	118	—	—	—	—	—	—	—	—	—
114	140	111	104	38	37	43	114	564	346	142	131	106	122	139	127	2000
109	137	108	107	38	40	38	124	—	—	140	134	110	118	131	118	—
104	132	105	102	35	40	43	115	538	332	138	121	104	113	122	118	—
113	138	104	102	34	38	43	117	—	—	—	—	—	—	—	—	—
115	137	105	102	40	44	44	120	543	352	144	124	102	117	132	129	1935
105	134	111	100	35	39	44	109	—	—	143	124	100	109	123	117	1945
102	127	—	100	33	36	42	120	—	—	—	—	—	—	—	—	—
—	133	—	—	—	36	36	—	—	—	—	—	—	—	—	—	—
108	131	96	—	—	36	38	—	—	—	—	—	—	—	—	—	—
117	138	108	98	36	46	42	109	538	353	—	—	—	—	—	—	—
112	137	100	104	33	41	42	116	—	—	—	—	—	—	—	—	—
126	149	116	110	36	44	40	120	565	375	150	134	106	116	135	124	—
107	140	—	103	36	43	39	118	—	—	144	133	108	112	122	123	—
104	140	112	105	35	41	42	120	543	335	140	128	108	117	131	117	1825
104	135	104	—	—	38	39	—	—	—	134	119	97	—	123	115	1790
111	133	104	104	35	39	39	115	537	337	—	—	—	—	—	—	—

The numbers at the top of the thirty columns of each table refer to the following measurements:—

3. Stature.
4. Height of ear-*meatus* from ground.
5. Height of chin from ground.
6. Height of acromion from ground.
7. Height of elbow from ground.
8. Height of wrist „ „
9. Height of hips „ „
10. Height of knee „ „
11. Height of ankle „ „
12. Head breadth.
13. Head length.
14. Upper facial length.
15. Total facial length.
16. Bimalar facial breadth.
17. Maximal facial breadth (bizygomatic).
19. Maximal mandibular breadth (bigonial).
22. External interorbital breadth.
24. Internal interocular breadth.
25. Nasal breadth.
26. Nasal length.
27. Orbito-nasal arc.
28. Horizontal circumference.
29. Biauricular arc.
30. Auriculo-vertical radius.
31. Auriculo-frontal radius.
32. Auriculo-nasal radius.
33. Auriculo-alveolar radius.
34. Auriculo-mental radius.
35. Auriculo-occipital radius.
44. Span of arms.

Each subject, after he had been photographed and his physical features had been noted, was marked with a blue pencil on the following points:—the tip of the acromion for 6 (in the above list of measurements), the edge of the head of the radius for 7, the tip of the styloid process of the radius for 8, the upper margin of the great trochanter for 9, the lower border of the internal condyle of the femur for 10, the tip of the internal malleolus for 11, the glabella for 13 and 28, the nasion for 14, 15, 26, and 32, the lower border of the chin for 15 and 34, the lower angle of the malar bone for 16, the angles of the jaw for 19, and the external border of the orbits at the suture for 22 and 27.[1]

[1] Herein we have been guided by the excellent *Anthropologische Methoden*, published by the late Dr. Emil Schmidt, Leipzig, 1888.

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TYPES OF SUDANESE.

A CONTRIBUTION TO THE ANTHROPOLOGY OF THE SUDAN.

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TYPES OF SUDANESE.

A CONTRIBUTION TO THE ANTHROPOLOGY OF THE SUDAN.

Measurements 4–11 were taken upon the subject standing beside a wall to which a measuring tape had been fixed. A right-angled triangular piece of celluloid was applied to the scale to find the height of the point in question.

Measurements 12–26 were taken with callipers in the ordinary way. The sliding instrument, designed by Mr. John Gray (and described in this *Journal*, vol. xxxi, p. 111), was used throughout.

Measurements 27 and 28 were taken by means of a steel tape passed between the external margins of the orbits across the nose, or embracing the glabella and the most projecting point of the occiput. Measurement 29 was taken by passing the tape over the top of the head from ear-hole to ear-hole.

Measurements 30–35 were taken from the ear-hole to the most projecting frontal or occipital points or to the nasion, upper alveolus or chin. An apparatus, fitted with a goniometer (as described by one of us in *Man*, vol. iii, 1903, No. 4, p. 12), was used for this purpose. It was provided with a device, designed by Mr. Gray, which kept the horizontal or vertical traction upon the ear-holes constant during the taking of the various radial measurements.

Notes on the Photographs.

No. 178. Nubawi, C.I. 71·76, N.I. 102·26, U.F.I. 48·55, nose root depressed, eyes oblique, ears prominent, mouth large, lips everted. Subject number 2056.

No. 195. Bandawi, C.I. 75·40, N.I. 93·90, U.F.I. 53·03, nose root almost absent, eyes widely separated, forehead sloping considerably, face very long. Subject number 2160.

No. 200. Dinkawi, C.I. 71·58, N.I. 100·0, U.F.I. 45·23, head extremely narrow, flat at the temples, brow ridges prominent. Subject number 2170.

No. 196. Fertitawi, C.I. 76·46, N.I. 113·51, U.F.I. 39·72, a great contrast to the Dinka photographed. Subject number 2161.

No. 193. Bertawi, C.I. 79·46, N.I. 125·0, U.F.I. 40·85, lower prognathism marked. Subject number 2136.

No. 194. Bongawi, not measured.

No. 197. Shilluk, C.I. 78·50, N.I. 88·63, U.F.I. 47·76, nose root usually prominent. Subject number 2162.

No. 204. Furawi, C.I. 75·66, N.I. 93·35, U.F.I. 46·10. Subject number 2182.

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