

A STATISTICAL COMPARISON OF THE PHYSICAL FEATURES OF  
THE ZULU-XHOSA AND SOUTH SOTHO-TSWANA PEOPLES OF  
SOUTH AFRICA

by

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I N T R O D U C T I O N

The Bantu-speaking Negro tribes of South Africa have been widely studied in connection with their language, their history and their culture. Their physical characters have also been defined and compared morphologically and, to a certain extent, biometrically. Biometrical workers in the past more often took measurements of detribalised Bantu or of Bantu away from their homes. Under these circumstances it would be more difficult and sometimes impossible to extract the correct information as to their tribal origin. This study is based on measurements taken in the course of a lengthy journey by motor and trailer through the Ciskei, the Transkei, Natal and Zululand, Basutoland and the Bechuanaland Protectorate. The tribes studied are densely concentrated and in their purest form in these Native Reserves, so that recent hybrid elements are minimal. Statistical methods in comparing the physical characters of these important Bantu groups of South Africa have been applied; only this method, in the author's opinion, could reveal to what extent one tribe differs from its closely related neighbour. These findings, whether positive or negative, seemed to the author to be worth ascertaining with a view to correlation with the evidence collected by linguists, ethnologists and historians.

MATERIAL      AND      METHODS

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The Negro physical group of Africa comprises the true Negro of West Africa, the Nilote in Central Africa north of the equator, and the Bantu-speaking tribes to the south of the equator. The Bantu are known to contain a strong Hamitic strain and traces of various indigenous and foreign elements. Lack of a better designation compels physical anthropologists to use the linguistic term "Bantu", meaning "people", when referring to the Negro population groups of Southern Africa. The term "Bantu" actually refers to a large group of grammatically similar languages, quite different from the languages of the West African Negro groups or of the Nilotes. The West African Negro, looked upon as the parent stock from which Nilote and Bantu originated, is tall, dolichocephalic, with a broad, flat nose, thick lips, a dark-brown skin and a thick crop of black, woolly hair. Two main South African sub-groups of the Bantu are recognized, namely the Nguni and the Sotho, and the tribes which have been investigated all fall into one or other of these two main groups.

The following tribes and numbers of individuals from each tribe were studied:-

Gqunukwebe Xhosa	: 120 )	250)	}	520 Nguni males
Gaika Xhosa	: 130 )			
Fingo	: 120 )	270)	}	
Zulu	: 150 )			
South Sotho	: 150 )	}	}	450 Sotho males
Kwena Tswana	: 150 )			
Kgalagadi Tswana	: 150 )			

TOTAL      : 970 males between the ages of 21 and 75.

Some Bushman data for comparison with the Bantu were also collected.

BASUTOLAN

ORANGE  
FREE  
STATE

EASTERN CAPE

Amatole  
Mountains

Keiskamma Hoek  
101 Fingo

Alice • Middledrift

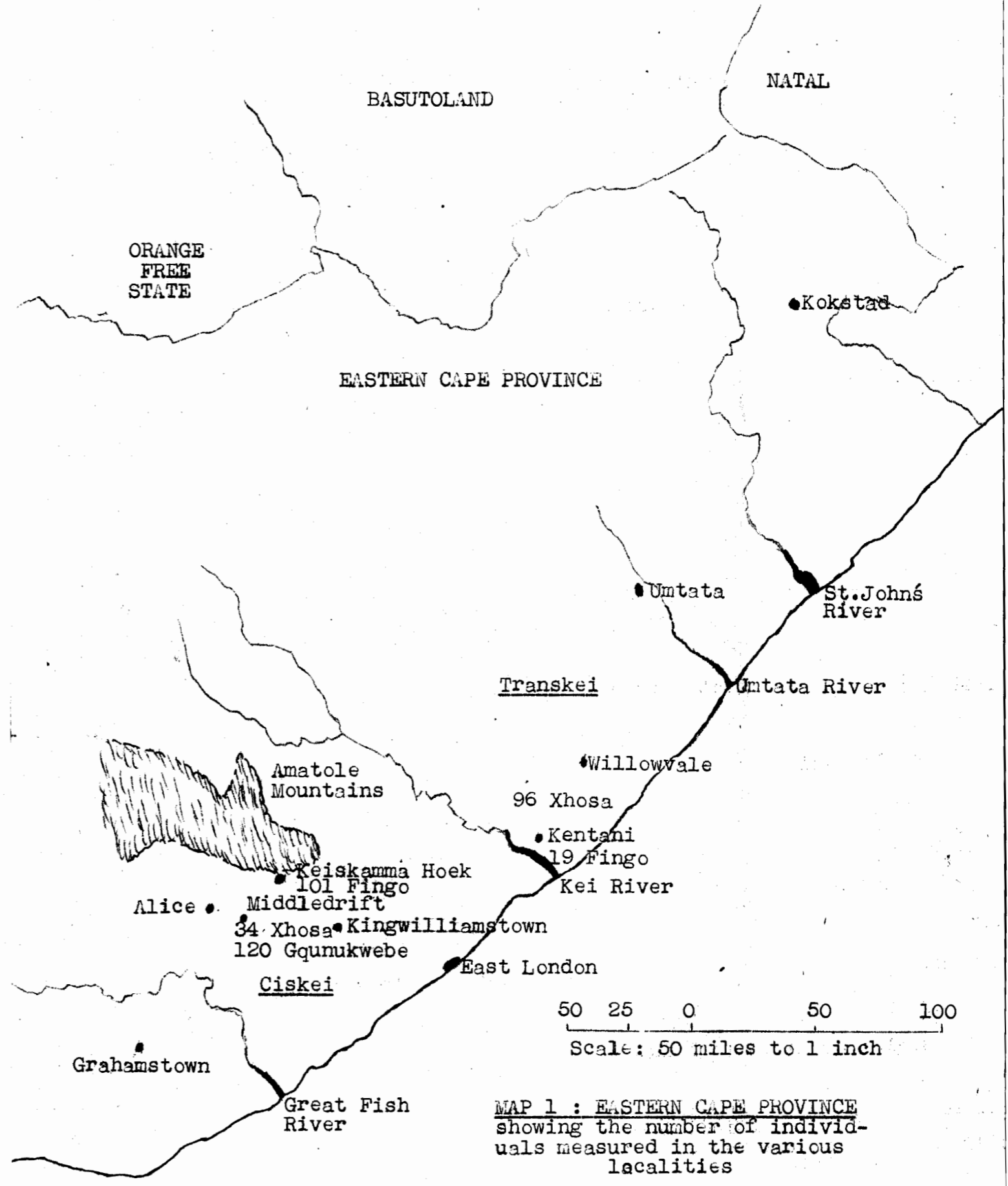
34 Xhosa • Kingwilliams  
120 Gqunukwebe

Ciskei

Eas

Grahamstown

Great Fish  
River



MAP 1 : EASTERN CAPE PROVINCE  
 showing the number of individuals measured in the various localities

Transkei. They are however greatly concentrated in the Kingwilliamstown, Kentani and Willowvale Districts. They are the leading tribe in the Transkei and formed the spearhead of resistance against European domination throughout the 19th Century. Certain clans of the Xhosa people are known to have mixed largely with the Hottentots, e.g. the Ntindeclan. Bantu fugitives from Natal between 1815 and 1836 introduced a new tribal element into the Xhosa make-up. During the Kaffir War of 1850 a large section of the Xhosa were ejected from the Amatole Mountains and driven across the Kei River, but remnants of them are still to be found in the Middledrift District (Burton, 1950).

The Xhosa language contains three clicks. It is interesting to note that the Zulu language contains the same three, the Sotho language one of them, while no clicks are found in any other Bantu language in the Union or in Rhodesia. Soga (1930) points out that all three clicks had already been acquired by the Xhosa by 1600, but more probably long before that. He gives examples of names that already contained these clicks before 1600. In his opinion they were acquired at a very early date from the Bushmen. He is supported in this view by Bryant (1950), who thinks that these clicks were acquired in the 15th Century when the Nguni group of Bantu numbered only about 10,000 persons. According to Bryant, they were the first immigrants to come into contact with Bushmen and Hottentots, who at that time were large population groups. Thus the influence on the language and the physical make-up was a considerable one. Professor Doke of the Witwatersrand University remarks that clicks are a non-Bantu linguistic phenomenon, and that they are due to influence of the Bushman and Hottentot languages (Schapera-Doke, 1937).

Only persons of pure Xhosa extraction were selected for measurement : the larger group (96) in the Kentani District to the east of the Kei River, and the remaining 34 in the Ciskei.

Fingo (amaMfengo, hereafter called the Fingo; symbol : F).— As a result of the Chaka and Dingaan conquests between 1815 and 1836, thousands of fugitives left Natal and Zululand and settled amongst the Xhosa and other Eastern Cape Province tribes, and form the basis of the present day Fingo. The majority belong to the Hlubi, Zizi and Bhele tribes. They reside irregularly in smaller or bigger colonies between Kokstad, Basutoland and the Great Fish River. Also thousands of detribalised Fingo are spread on the farms of the Eastern Cape Province (Schapera-Van Warmelo, 1937).

In 1835 twenty thousand semi-enslaved Fingo left the Transkei and settled as far west as the Great Fish River under European protection. Many Fingo however remained with their Xhosa masters, and so introduced a non-Xhosa element into the physical make-up of the tribe. Since their emancipation, the Fingo always fought on the side of the Europeans. In 1850 the Gaika Xhosa were expelled from the Eastern Amatole Mountains and the Fingo took their places in the present Keiskamma Hoek, Middledrift and Alice Districts. The Xhosa were driven across the Kei River, but small remnants remained behind. The Fingo are intermarrying extensively with their neighbours, the Xhosa and the Gqunukwebe. The Fingo speak Xhosa and practise Xhosa culture. Only Fingo of pure Fingo parentage were used in this study : 101 in the Ciskei and 19 in the Kentani District.

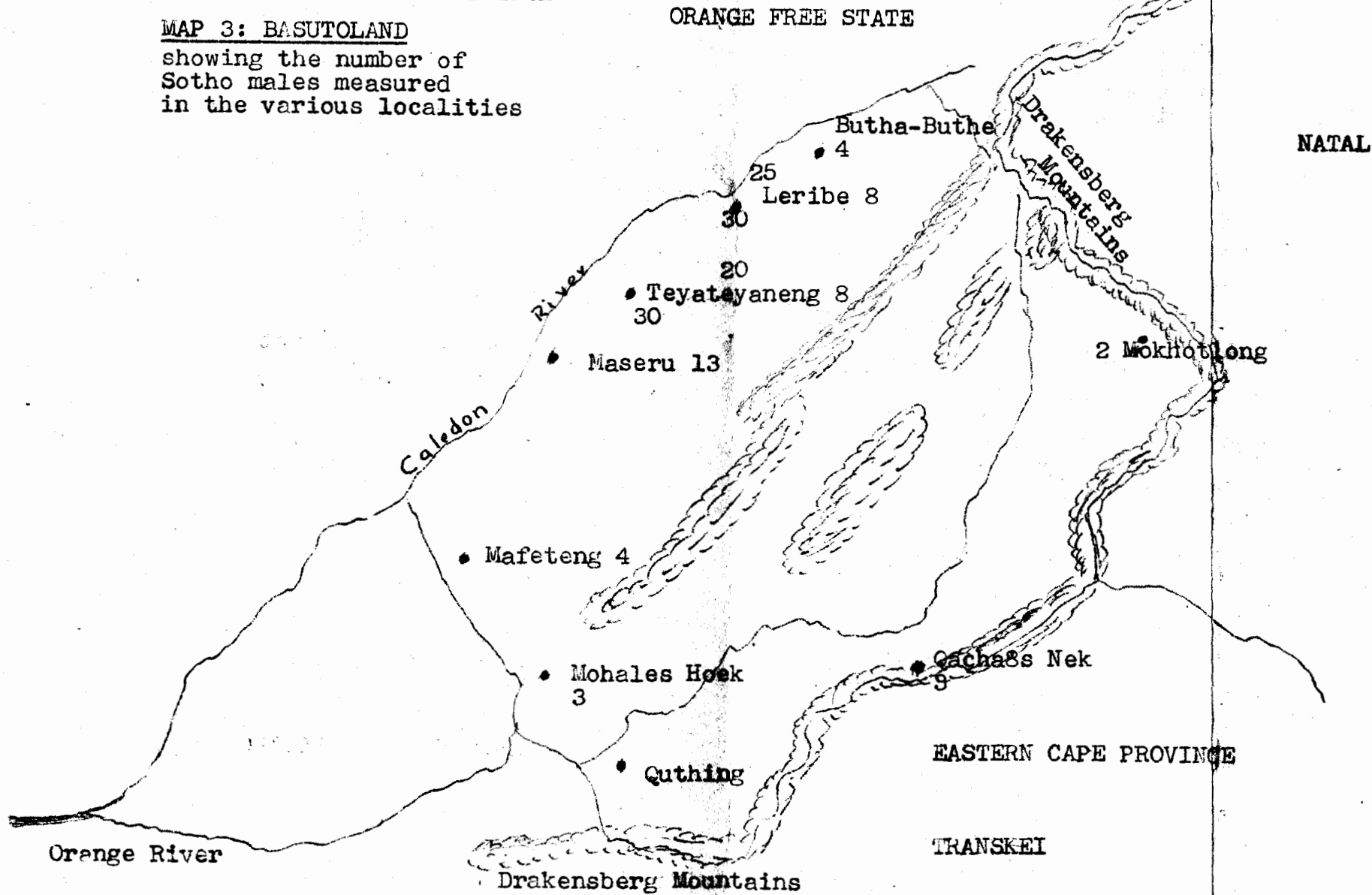
Zulu (amaZulu, hereafter called the Zulu; symbol:Z ).— Before the Zulu upheaval, starting about 1815, the Natal-Zululand tribes comprised three groups who had settled in Natal before 1600 : the Ntungwa in Zululand, the Lala in Natal and the Embo in Upper Natal and Swaziland. The Cape tribes had by this time already reached their present homes (Bryant, 1950). The rulers of the small Ntungwa tribe, the Zulu, started a series of conquests and imposed their language and customs upon the other Natal-Zululand tribes, conquering and dislodging one

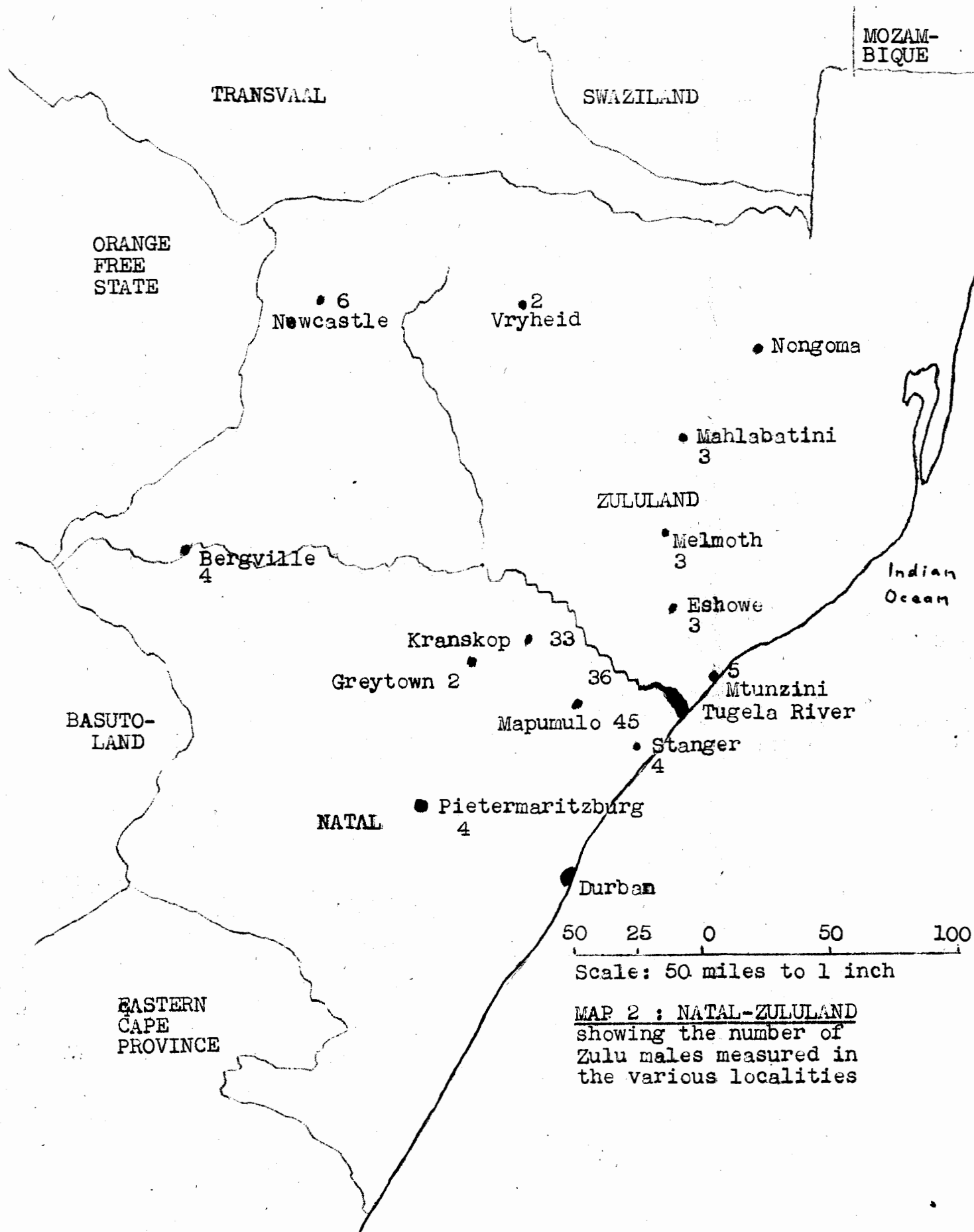
30 15 0 30 60

Scale: 30 miles to 1 inch

MAP 3: BASUTOLAND

showing the number of  
Sotho males measured  
in the various localities





**MAP 2 : NATAL-ZULULAND**  
 showing the number of  
 Zulu males measured in  
 the various localities

after the other. The men were collected and trained for army service. Insubordinate clans left Natal in all directions. Those that remained in Natal were so thoroughly mixed, that it is hardly possible to distinguish between the Ntungwa, Lala and Embo stock, and they are to be considered as Natal Nguni as a whole.

The Zulu data were collected from the thickly populated area of the Tugela Valley (Map 2). The 150 males studied, represented 98 different Zulu clans in their parentage. Moreover Zulu students from all over Natal were measured at the Umpumulo Teachers' Training College.

South Sotho (baSotho, hereafter called the Sotho, symbol: S).— Before the rise of Chaka, the inhabitable western part of Basutoland and the adjoining territory (Map 3) were occupied by various South Sotho clans, all probably fairly similar in language and culture. The majority of these clans had come from the north west and spoke a Sotho dialect. During the 19th Century there was also an influx of small groups, belonging to the Bechuanaland tribes (Ellenberger, 1912; Van Warmelo, 1935). The raids of the fugitive Nguni from Natal ousted many Sotho clans from their homes. Moshesh however collected the remnants of the Sotho clans and welcomed all fugitives who sought his protection. To-day the South Sotho reside in Basutoland, the Orange Free State, and in the Transkei to the south of Basutoland. It may be pointed out that "Kwena" is an ancient designation amongst the Sotho and Tswana, and refers to a tribe who migrated south into Bechuanaland in the 15th Century. This Kwena tribe afterwards split up into various sub-groups, and a small section of it migrated south to the present Basutoland (Ellenberger, 1912).

During the last century sections of Nguni from Natal and the Transkei settled in certain parts of Basutoland, and at present small communities of Nguni are spread all over Basutoland. They are collectively called "Têbêlê" by the

Sotho. The author would estimate the Bantu population groups in Basutoland as being 50 percent pure Sotho, 25 percent pure Nguni and 25 percent hybrid Sotho-Nguni. This roughly agrees with the 1935 census figures for the Têbêlê given by Van Warmelo (1935).

Ellenberger (1912) points out that the South Sotho mixed with the Bushmen after their arrival in their present home. Several mountains and rivers bear Bushman names, and the Sotho language contains several hundred words with a click. The Bushmen taught the Sotho to smoke hemp and to circumcise their children. The Bushmen allowed their daughters to intermarry with the Sotho, and certain tribes, especially the Fokeng, show traces of Bushman blood (66 Fokeng were measured). Dissension once arose when the son of a Bushwoman succeeded to chieftainship.

Among the 150 males studied in Basutoland, there were no pure Nguni, but 35 Sotho-Nguni hybrids were included. The Sotho section (115 males) represented fourteen clans of pure Sotho stock, and the 35 Sotho-Nguni hybrids represented five clans of Nguni stock. The difference in skin colour between the Sotho and Nguni was so obvious, that it was a comparatively easy matter to distinguish between them. The Nguni are consistently darker.

Kwena Tswana (baKwena, hereafter called Kwena; symbol: K).— The Bantu tribes residing to-day in Bechuanaland, are collectively known as the Tswana and have a common language. The Kwena sub-division of the Tswana resides in the Kwena Reserve to the west of Gaberones in the Bechuanaland Protectorate. This Reserve stretches for a distance of 250 miles from Gaberones into the Kalahari Desert, and is about 100 miles across from north to south. The capital and residence of the chief is Molepolole (Map 4).

The Kwena, like the other Bantu of Bechuanaland

cannot be said to be permanently settled in one place throughout the year. During the summer season they are away from "home", cultivating their fields which may be 50 miles distant. In winter they congregate in their towns. This mode of living is due to scarcity of water, grazing grounds and available arable land and <sup>an</sup> "adaptation by which the tribe is maintained in the face of conditions strongly disruptive of that solidarity" (Van Warmelo, 1935). In 1934 the male population of Molepolole was reported to be about 4000 adults.

The present Kwena tribe is however only a fraction of the large Kwena tribe that entered Bechuanaland from the north about 1600. Shortly after its arrival, it started sending off shoots, e.g. Ngwato, Tawana and Ngwaketse. The attack in 1821 by the Tlokwa, a Sotho clan from Basutoland, and the slaughter caused by the Tebele not long after this, left a severely depleted Kwena tribe. The Kwena have been in close contact with the Kgalagadi, a Tswana group that settled in Bechuanaland before the Kwena, and with the Sarwa, a predominantly Bushman group. The Kwena tribe of Bechuanaland is physically the best representative of the Tswana.

Kgalagadi Tswana (baKgalagadi, also called the Vaalpense, hereafter called the Kgalagadi; abbreviation Kgal, symbol : Kg ).— The Kgalagadi speak a group of related Tswana dialects. There are numerous clans, widely spread from Ngamiland and the Ngwato Reserve in the north, as far south as the Mafeking, Kuruman and Vryburg Districts in the Union of South Africa. These Kgalagadi clans are components of about seven bigger groups, and these do not all seem to have had a common origin:— Kgwatleng, Boloongwa, Shaga, Ngologa, Pedi, Phaleng and Shiwana. Their traditions indicate that they formerly occupied the land at present owned by the Kwena and their offshoots, but that they were broken up and driven towards the Desert by invading Kwena.

At present the largest number of Kgalagadi, while numbering about 2500, according to Schapera and Van der Merwe

(1945), are concentrated in the Kgalagadi District between the Kwena Reserve and the South West Africa border; (see Map 4). The Kgalagadi residing in the Tswana reserves, used to perform servile duties for their masters, but the position has been improved as a result of the interference of the Administration. The Kgalagadi in turn use the Sarwa Bushmen to perform certain tasks for them, and they openly claim Sarwa individuals as their personal property.

Although the Kgalagadi also keep livestock and cultivate the soil, they depend to a certain extent upon hunting. The arid nature of the country, which has an annual rainfall of only 10 inches, is responsible for this. The villages are concentrated where there are permanent water holes. As a result of the greater amount of meat they eat, and less grain, the Kgalagadi are well built and muscular. I did not find any with superfluous adipose tissue, as was common amongst the South Sotho and, to a lesser extent, amongst the Fingo and Zulu.

All the authorities point out that the Kgalagadi have been affected by Bushman admixture, more than any other Bantu-speaking group in Southern Africa. A sub-group of the Kgalagadi, known as the baLala, has come into existence as a result of this interbreeding. The Lala live a hunting life like the Sarwa, and are looked upon as much inferior to the Kgalagadi. The Kgalagadi use Sarwa women as concubines.

The Kgalagadi males studied, were all resident in the Kwena Reserve and comprised the following tribal groups:- 83 Boloongwa (at Metsebotloko, Kudumalapshwe, Letlhakeng and Lophephe; 49 Kgwatleng (at Letlhakeng); 10 Shaga (at Tsetseng and Kang); 8 Phaleng (at Suping and Molepolole); (see Map 4).

Bushmen (symbol : B).— While in Bechuanaland, I also measured 5 Sarwa men, whom I considered representatives of the Bushmen. To these have been added the data obtained from the following sources :- Keen (1947 and in the press); Dart (1937). The Bushman crania measured for these data, were the collections

SOUTH WEST AFRICA

TAWANA (Tswana)  
RESERVE  
NGAMILAND

NGWATO (Tswana)

SOUTHERN  
RHODESIA

RESERVE

•Kg

Serowe  
Kg

Palapye

TRANSVAAL

KALAHARI

•Kg

Mahalapye

KWENA (Tswana) RESERVE

Kg Lophephe

60 30 0 60 120

KGALAGADI

Kudumalapshwe  
Kg (45)

Scale: 60 miles to 1 inch

Kang Kg (12)  
Tse-tseeng

Metsebotloko Kg (13)

Kg: Places where Kgalagadi reside

Kg

Lotlhakeng Kg (69) Suping Kg (8)

KHATLA (Tswana) RESERVE

150: Number of Kwena measured

DISTRICT

NGWAKETSE (Tswana) RESERVE

Malepolole 150  
Gaberones

(45) Number of Kgalagadi measured

DESERT

kg kg kg

Lobatsi

MAP 4: BECHUANALAND PROTECTORATE

Nasob River

Molopo River

Mafeking

showing the number of individuals measured in the various localities.

of the National Museum, Bloemfontein, of the Anatomy Department of the University of Cape Town, and of the South African Museum, Cape Town.

### Methods

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The measurements used, are listed in Tables 1, 9, 17, 23, 28 and 36. They comprised 25 direct measurements of the vault, face, nose and ear, 20 direct measurements of the trunk and limbs, and 5 calculated measurements. From the measurements 28 indices were derived, - 15 of the vault, face, nose and ear, and 13 of the trunk and limbs. Most of these measurements were made according to <sup>the</sup> definitions found in Martin (1928).

In the case of the following measurements the necessary landmarks were first palpated and marked with a soluble, white pencil dipped in water.— minimum frontal width, width of the eyebrow ridges (between the external angular processes), nasion, tragion, external orbital margins, supra-sternale, meso-sternale, symphision, acromion, radiale, stylium, tibiale, spherion and ilio-cristale.

The indices were read off as whole numbers with the aid of prepared charts. Cranial Capacity was calculated by means of the Lee-Pearson formula :-

$$\text{Cranial Capacity} = .000337(L-11)(B-11)(H-11)+406.01.$$

In the case of the Bushman crania (Keen, 1947), the cranial capacity had been established by means of the Welcker set of tables (Martin, 1928); from these results the supra-auricular head heights were determined by using the Lee-Pearson formula. In order to be able to compare the data obtained from the skulls with the measurements on the living, allowances must be made for skin thickness. In the case of maximum length of the skull, 7 mm. were added, for maximum breadth of the skull 10 mm., for

maximum bi-zygomatic width of the skull 6 mm., for upper facial height 1 mm., and for minimum frontal width 6 mm.

The length of the middle finger was determined according to the method used by Bertillon (Martin, 1928). The fingers are flexed at right angles, and the middle finger is measured from the knuckle to the tip; the thickness of the end of the metacarpal is therefore included in the length of the middle finger. The cubital length (Bertillon) is the distance between the tip of the olecranon and the tip of the middle finger, when the fore-arm is flexed at the elbow.

From the data obtained, I calculated the means, the standard deviations and the coefficients of variability by the recognized methods, after choosing a suitable class interval. A further method used, was the calculation of the critical ratio of the difference between the means. The formula used for obtaining the critical ratio was :-

$$\text{critical ratio} = \frac{M_1 - M_2}{\sqrt{\epsilon_1^2 - \epsilon_2^2}}$$

where  $M_1$  is the bigger mean,  $M_2$  the smaller mean, and  $\epsilon_1$  and  $\epsilon_2$  the respective standard deviations of the means. The denominator in this formula is called the standard error of the difference.

In this study the critical ratios ranged from almost 0 to 9.8 in the case of the Bantu groups, and even higher where the Bantu were compared with the Bushmen. Critical ratios below 2.5 have been omitted as insignificant. This makes ample allowance for chance distribution of the data. If the critical ratio is 2.5, a difference equal to or greater than the observed difference between the two means will, according to the laws of probability, not occur in more than 6 in a 1000 of any selection of individuals from the same group. The critical ratios between 2.5 and 4.4 have been taken as significant, and above 4.4 as highly significant.

## R E S U L T S

### SECTION 1 - THE VAULT

In Table 1 appear the results of 11 measurements and indices of the vault of the head in the 7 Bantu tribes which were studied, and in the Bushmen. In Table 2 appear the critical ratios of the differences. At the head of each small column is indicated which groups have been contrasted. The Bantu groups were not all compared with each other. On the other hand the Kgalagadi and the Bushmen were compared with all the Bantu groups available, as seen in the right hand half of Table 2. At the foot of each column the critical ratios have been expressed as percentages of insignificant (0 to 2.4), significant (2.5 to 4.4), and highly significant (4.5-) differences. At the end of Table 2 is a column giving the order in which the tribes are arranged in accordance with their means, the tribes with the largest dimensions being placed to the left, and those with the smallest dimensions to the right. When the critical indicated an insignificant difference, the tribes are bracketed.

Maximum Head Length, Maximum Head Breadth and Breadth/Length Index.— The means seen in Table 1 show that the Bantu tribes as regards maximum head length show very little difference. As regards maximum head breadth, there are two separate classes, with a fairly big interval between the narrow Kgalagadi and Kwena on the one side, and the other tribes on the other side. We thus find less uniformity in head width. The breadth/length index has a wide range, with the Zulu and Fingo heads on the brachycephalic side, the Kwena and Kgalagadi on the hyperdolichocephalic side. The breadth/length indices have been divided into the recognized groups and the percentage distribution is indicated in Table 3.

VAULT	120 GQUNUKWEBE			130 XHOSA			120 FINGO			150 ZULU			150 SOTHO			150 KWENA			150 KGALAGADI			BUSHMEN							
	Range	Mean ± E	C.V.	Range	Mean ± E	C.V.	Range	Mean ± E	C.V.	Range	Mean ± E	C.V.	Range	Mean ± E	C.V.	Range	Mean ± E	C.V.	Range	Mean ± E	C.V.	Number	Range	Mean ± E	C.V.				
1. Maximum Head Length	185-215	199.7 ± .6	6.6	3.3	182-221	198.5 ± .6	6.3	3.2	183-219	198.3 ± .6	6.9	6.4	3.2	175-214	198.7 ± .5	6.4	3.2	183-213	196.5 ± .5	5.7	2.9	176-218	197.6 ± .5	6.2	3.1	164-203	182.5 ± .7	7.2	3.9
2. Maximum Head Breadth	131-166	147.2 ± .5	6.0	4.1	135-163	146.9 ± .5	5.5	3.7	131-161	148.4 ± .5	5.3	5.4	3.7	133-162	146.3 ± .5	5.5	3.8	133-157	143.7 ± .4	5.0	3.4	131-158	143.2 ± .4	4.8	3.3	104	143.8 ± .5	4.9	3.4
Breadth/Length Index(2:1)	64-81	74.1 ± .3	3.5	4.7	68-81	74.6 ± .2	2.7	3.5	65-83	75.2 ± .3	2.8	2.8	3.8	68-83	75.3 ± .2	2.8	3.8	67-78	73.7 ± .2	2.3	3.2	66-78	72.9 ± .2	2.6	3.5	104	79.3 ± .3	3.2	4.1
3. Supra-auricular Head Height	100-137	117.6 ± .8	9.0	7.6	101-137	119.3 ± .7	8.3	7.0	100-140	117.8 ± .8	8.6	8.4	7.0	97-138	116.0 ± .6	6.8	5.8	95-132	117.3 ± .6	7.1	6.1	93-135	115.1 ± .6	6.9	6.0	103	114.9 ± .8	8.5	7.4
Height/Length Index(3:1)	50-71	59.5 ± .4	4.5	6.3	50-69	60.6 ± .3	3.8	7.5	47-70	59.8 ± .4	4.4	4.3	6.9	49-69	59.0 ± .3	3.5	5.9	47-68	60.0 ± .3	3.7	6.2	47-72	58.8 ± .3	3.7	6.3	103	63.3 ± .4	4.1	6.5
Height/Breadth Index(3:2)	67-98	80.4 ± .6	6.5	8.1	68-91	81.6 ± .5	5.2	6.4	62-98	79.6 ± .6	6.4	8.0	6.8	64-99	79.7 ± .4	4.8	6.0	68-92	81.6 ± .5	5.5	6.7	64-99	80.9 ± .4	5.1	6.3	103	80.5 ± .5	5.5	6.8
4. Cranial Capacity (in cc <sup>3</sup> )	1018-1630	1320.6 ± 10.0	109.3	8.3	1053-1752	1328.3 ± 10.4	118.1	8.9	1114-1547	1326.9 ± 8.2	100.5	7.6	8.6	1023-1589	1293.0 ± 8.0	97.7	7.6	1001-1519	1277.0 ± 8.6	91.9	7.2	1025-1561	1264.0 ± 7.9	83.8	6.5	103	1219.2 ± 10.4	106.0	8.7
5. Minimum Frontal Width	93-119	106.6 ± .5	5.3	4.9	89-115	104.8 ± .5	5.5	5.3	91-121	106.0 ± .6	5.1	4.8	3.5	91-115	103.6 ± .4	5.1	4.9	88-119	101.8 ± .4	5.0	4.9	85-112	101.6 ± .4	4.8	4.7	104	99.6 ± .5	5.1	5.1
Transverse Fronto/Parietal Index(5:2)	61-88	72.6 ± .4	4.3	5.8	61-82	71.1 ± .3	3.9	5.5	62-80	71.7 ± .3	3.6	5.0	5.0	63-79	71.1 ± .3	3.6	5.0	61-80	70.9 ± .3	3.4	4.4	62-81	71.4 ± .3	3.3	4.6	104	69.8 ± .3	3.5	5.1
6. Bi-mastoid Width	120-145	131.7 ± .5	5.1	3.8	118-151	129.8 ± .5	5.2	4.0	114-142	129.5 ± .5	5.6	4.3	3.8	119-143	128.6 ± .4	5.5	4.2	116-140	127.8 ± .4	4.9	3.8	117-142	129.3 ± .4	4.8	3.7	5	126.6		
Bi-mastoid/Bi-parietal Index(6:2)	78-96	90.1 ± .3	3.5	3.9	80-97	89.0 ± .3	3.3	3.7	81-97	88.0 ± .3	3.4	3.9	3.8	81-99	89.0 ± .2	3.6	4.1	81-100	89.5 ± .3	3.2	3.6	82-99	90.7 ± .3	3.3	3.7	5	90.0		

TABLE 1, showing the ranges, means, standard deviations and coefficients of variability of 11 VAULT measurements and indices of the 7 Bantu tribes studied and of the Bushmen. (All measurements in millimeters, except where indicated)

VAULT	Kg a l a g a d i			B u s h m e n		
	Gqun : Fingo	Sotho : Zulu	Kwena : Xhosa	Gqun : Fingo	Sotho : Zulu	Kwena : Xhosa
1. Maximum Head Length	18.6	16.0	16.7	16.5	18.3	17.6
2. Maximum Head Breadth	4.9	4.6	6.6	5.0	3.8	
Breadth/Length Index(2:1)	11.5	11.9	10.0	10.2	13.4	16.8
3. Supra-auricular Head Height	6.8	5.3	6.3	5.8	8.8	9.1
Height/Length Index(3:1)	7.3	2.9	2.9	2.7	2.7	
Height/Breadth Index(3:2)	2.8					
4. Cranial Capacity (in cc <sup>3</sup> )	7.0	7.4	8.1	8.5	5.6	4.3
5. Minimum Frontal Width	10.0	7.5	8.5	9.0	6.1	3.3
Transverse Fronto/Parietal Index(5:2)	7.4	2.8	4.1	3.0	2.7	2.8
6. Bi-mastoid Width						
Bi-mastoid/Bi-parietal Index(6:2)	8.0	5.0	3.2			
Total percentage of critical ratios						
Insignificant	81.8	72.7	90.9	72.7	45.5	45.5
Significant	18.2	18.2	9.1	18.2	54.5	36.4
Highly Significant	9.1	9.1	9.1	9.1	27.2	18.1

TABLE 2, showing the CRITICAL RATIOS of the differences between the means of 11 VAULT measurements and indices in the 7 Bantu tribes studied and in the Bushmen.

Tribes arranged in accordance with their means  
 Largest Q (S K G X F Z K) B  
 Smallest Q (F Z X S) (B K K G)  
 Z X Q F K S K G B  
 Z X F Q S K K G B  
 (Q F Z X S) (K K G) B  
 Q (F X S K G Z K)

Abbreviations: Gqunukwebé = G,  
 Xhosa = X, Fingo = F, Zulu = Z,  
 Sotho = S, Kwena = K,  
 Kgagalagadi = Kg, Bushman = B.

<u>Breadth/Length Index</u>			
	Dolichocephalic (X-75)	Mesaticephalic (76-80)	Brachycephalic (81-X)
Gqunukwebe :	70.8%	27.5%	1.7%
Xhosa :	73.1%	26.2%	0.7%
Fingo :	69.1%	26.7%	4.2%
Zulu :	57.4%	39.3%	3.3%
Sotho :	75.3%	24.7%	0.0%
Kwena :	82.0%	18.0%	0.0%
Kgalagadi :	88.7%	11.3%	0.0%
<hr/>			
<u>Bantu Total</u> :	<u>74.0%</u>	<u>24.6%</u>	<u>1.4%</u>
Bushmen :	14.4%	61.5%	24.1%

Table 3, showing the percentages of dolichocephaly, mesaticephaly and brachycephaly among the Bantu tribes examined and the Bushmen.

Supra-auricular Head Height (No. 3 in Tables 1 and 2).— This dimension was obtained by deducting auricular atature from stature. For both measurements the head was in the Frankfort plane. This is the indirect method, for which no head spanner is used.

In connection with the supra-auricular head height, the highest mean is seen in the Zulu, the lowest in the Kgalagadi. The coefficients of variability of this dimension show that the supra-auricular head height is a more variable factor than the maximum head breadth (Table 1).

These two indices have been divided into the recognized groups and, after calculating the percentages, the distribution of these two factors in the seven Bantu groups and in the Bushmen is shown in Tables 4 and 5.

Height/Length Index.

	<u>Chamaecephalic</u> <u>(X-57)</u>	<u>Orthocephalic</u> <u>(58-62)</u>	<u>Hypsicephalic</u> <u>(63-X)</u>
Gqunukwebe :	39.2%	39.2%	21.6%
Xhosa :	25.4%	50.8%	23.8%
Fingo :	34.2%	45.0%	20.8%
Zulu :	15.3%	40.7%	44.0%
Sotho :	42.7%	46.7%	10.6%
Kwena :	28.7%	48.0%	23.3%
Kgalagadi :	44.7%	45.3%	10.0%
<hr/>			
Bantu Total:	32.9%	45.1%	22.0%
<hr/>			
Bushmen :	8.8%	37.9%	53.3%

Table 4 showing the percentages of chamaecephaly, orthocephaly and hypsicephaly among the Bantu tribes examined and the Bushmen.

Height/Breadth Index.

	<u>Tapeinocephalic</u> <u>(X-78)</u>	<u>Metriocephalic</u> <u>(79-84)</u>	<u>Acrocephalic</u> <u>(85-X)</u>
Gqunukwebe :	47.5%	30.0%	22.5%
Xhosa :	32.3%	40.8%	26.9%
Fingo :	47.5%	30.8%	21.7%
Zulu :	25.3%	38.7%	36.0%
Sotho :	44.7%	44.0%	11.3%
Kwena :	32.0%	37.3%	30.7%
Kgalagadi :	32.0%	48.0%	20.0%
<hr/>			
Bantu Total:	37.3%	38.5%	24.2%
<hr/>			
Bushmen :	38.8%	46.6%	14.6%

Table 5, showing the percentages of tapeinocephaly, metriocephaly and acrocephaly among the Bantu tribes examined and the Bushmen.

Cranial Capacity.- The calculated cranial capacities have been divided into the recognized groups and the percentage distribution of the three groups has been determined in the seven Bantu tribes and in the Bushmen. The results are presented in Table 6.

	<u>Cranial Capacity</u>		
	<u>Oligencephalic</u> (X-1229)	<u>Euencephalic</u> (1300-1449)	<u>Aristencephalic</u> (1450-X)
Gqunukwebe :	44.2%	42.5%	13.3%
Xhosa :	44.6%	43.8%	11.6%
Fingo :	40.8%	47.5	11.7%
Zulu :	40.0%	41.3%	18.7%
Sotho :	50.6%	40.3%	9.1%
Kwena :	62.7%	32.7%	4.6%
Kgalagadi :	70.7%	27.3%	2.0%
<hr/>			
<u>Bantu Total:</u>	<u>51.2%</u>	<u>39.2%</u>	<u>9.6%</u>
Bushmen :	80.6%	17.5%	1.9%

Table 6. Analysis of the cranial capacity results, showing the percentages of oligencephaly, euencephaly and aristencephaly among the Bantu tribes examined and the Bushmen.

The cranial capacities of the Bantu tribes analysed here, agree with the cranial capacities for the West African Negroes given by Martin (1928) and Sir Arthur Keith (1911). They also agree with the figures given for the Mozambique Bantu by J.R. Dos Santo Junior (1945).

Minimum Frontal Width and Transverse Fronto/Parietal Index.-

An analysis has been made of the transverse fronto/parietal index, because the relation between the minimum frontal width and the maximum head breadth shows considerable variations in the different Bantu tribes and the Bushmen. The indices have been divided arbitrarily into three groups:- A : X-67, B : 68-74, C : 75-X, and the percentage distribution of the three groups is given in Table 7.

Transverse Fronto/Parietal Index.

	A (X-67)	B (68-74)	C (75-X)
Gqunukwebe	: 15.8%	57.5%	26.7%
Xhosa	: 16.9%	63.9%	19.2%
Fingo	: 15.0%	70.0%	15.0%
Zulu	: 14.7%	70.6%	14.7%
Sotho	: 16.7%	76.7%	6.6%
Kwena	: 18.0%	68.0%	14.0%
Kgalagadi	: 12.7%	76.0%	11.3%
<hr/>			
Bantu Total	: 15.7%	69.4%	14.9%
Bushmen	: 32.0%	62.5%	5.5%

Table 7. Analysis of the transverse fronto/parietal indices, showing the percentage distribution among the Bantu tribes and the Bushmen, after arranging the indices into three groups.

The mean transverse fronto/parietal index for the Bantu given by Keen (1947) agrees with my figures. The West African Negro has a narrower forehead than the South African Bantu (Martin, 1928), and thus the transverse fronto/parietal index is lower. The Mozambique Bantu however has a wider forehead, and as a consequence a higher index (Dos Santos Junior, 1945).

Bi-mastoid Width and Bi-mastoid/Bi-parietal Index.---

The bi-mastoid width does not appear for the Bushmen, because only five living Bushmen were measured, and this particular dimension was not made use of in the skull data used for comparison. The bi-mastoid/bi-parietal index has been divided arbitrarily into three groups :- A : X-83, B : 84-89, C : 90-X, and the percentage distribution is given in Table 8.

Bi-mastoid/Bi-parietal Index.

	A (X-83)	B (84-89)	C (90-X)
Gqunukwebe :	4.2%	46.7%	49.1%
Xhosa :	6.9%	57.7%	35.4%
Fingo :	10.9%	68.3%	20.8%
Zulu :	14.7%	59.3%	26.0%
Sotho :	7.3%	52.7%	40.0%
Kwena :	4.7%	49.3%	46.0%
Kgalagadi :	0.7%	42.7%	56.6%
<hr/>			
<u>Bantu Total:</u>	<u>7.0%</u>	<u>53.5%</u>	<u>39.5%</u>

Table 8. Analysis of the bi-mastoid/bi-parietal indices, showing the percentage distribution among the Bantu tribes and the Bushmen, after arranging the indices into three groups.

The dimension of the bi-mastoid widths in various groups is given by Martin (1928) as follows: Bavarians 116, Tyrolese 122, Proto-Egyptians 116, and the bi-mastoid/bi-parietal indices in general are low. As can be seen in Table 1, the Zulu and Fingo present the lowest figures for this index. This reflects a Hamitic strain absorbed by these two Bantu groups.

SECTION 2 - THE FACE.

In Table 9 appear the results of 11 measurements and 5 indices of the face in the 7 Bantu tribes studied and in the Bushmen. In Table 10 appear the critical ratios of the differences. The tribes were contrasted in the same groups as for the vault dimensions and indices in Table 2. It will be seen that many of the data are not available for the Bushmen, but the important facial dimensions could be deduced from the skull data available in the literature. At the end of Table 10 is a column giving the order in which the tribes are arranged in accordance with their means, the tribes with the largest dimensions being placed to the left, and those with the smallest dimensions to the right. When the critical ratios indicated an insignificant difference, the tribes are bracketed.

Width of the Eyebrow Ridges, Maximum Bi-zygomatic Width and Eyebrowridge/Bi-zygomatic Index.---

The width of the eyebrow ridges was taken as the distance between the external angular processes. The width of the eyebrow ridges does not appear for the Bushmen, because only 5 living Bushmen were measured, and this particular dimension was not made use of in the data used for comparison.

As regards the width of the eyebrow ridges, it can be seen in Table 9 that the means of the 7 Bantu tribes fall into two classes, with a considerable range between the means. The critical ratios in Table 10 express highly significant differences for some of the groups that were contrasted. The difference as regards the width of the eyebrow ridges was so striking among the different Bantu tribes, that a new index, involving this dimension was introduced. This index, called the eyebrowridge/bi-zygomatic index, compares the width of the eyebrow ridges with the maximum bi-zygomatic width. An analysis has been made of this index. The indices

FACE	120 GQUNUKWEBE				130 XHOSA				120 FINGO				150 ZULU				150 SOTHO				150 KWENA				150 KALAGADI				BUSHMEN				
	Range	Mean ± $\epsilon$	C.V.	Number	Range	Mean ± $\epsilon$	C.V.	Number	Range	Mean ± $\epsilon$	C.V.	Number	Range	Mean ± $\epsilon$	C.V.	Number	Range	Mean ± $\epsilon$	C.V.	Number	Range	Mean ± $\epsilon$	C.V.	Number	Range	Mean ± $\epsilon$	C.V.						
7. Width of Eyebrow Ridges	105-129	116.0 <sup>±</sup> .4	4.8	4.1	101-127	114.0 <sup>±</sup> .5	5.3	4.6	104-131	115.8 <sup>±</sup> .5	5.0	4.3	100-125	113.7 <sup>±</sup> .4	4.9	4.3	101-124	112.0 <sup>±</sup> .4	4.6	4.1	98-123	111.3 <sup>±</sup> .4	4.6	4.2	93-125	111.3 <sup>±</sup> .4	4.8	4.3	5	106.2			
8. Maximum Bi-zygomatic Width	129-152	139.2 <sup>±</sup> .5	4.9	3.5	126-164	139.9 <sup>±</sup> .5	5.6	4.0	127-158	140.2 <sup>±</sup> .5	5.7	4.1	127-149	138.4 <sup>±</sup> .4	5.2	3.7	128-154	138.3 <sup>±</sup> .4	4.8	3.5	126-152	135.2 <sup>±</sup> .4	4.5	3.3	126-150	136.5 <sup>±</sup> .4	4.7	3.5	102	115-142	127.4 <sup>±</sup> .6	6.4	5.0
Eyebrow-ridge/Bi-zygomatic Index (7:8)	75-96	84.3 <sup>±</sup> .3	3.4	4.1	74-91	82.4 <sup>±</sup> .3	3.1	3.5	76-91	83.1 <sup>±</sup> .3	3.0	3.6	73-89	82.7 <sup>±</sup> .3	3.2	3.9	71-92	81.5 <sup>±</sup> .3	3.3	4.0	74-89	82.3 <sup>±</sup> .2	3.0	3.6	68-89	82.2 <sup>±</sup> .3	3.1	3.5	5	80.8			
9. Upper Facial Height	58-80	68.0 <sup>±</sup> .4	4.9	7.1	58-79	67.0 <sup>±</sup> .4	4.5	6.7	56-85	69.1 <sup>±</sup> .5	5.2	7.5	58-79	70.2 <sup>±</sup> .4	4.5	6.4	55-82	70.3 <sup>±</sup> .4	4.9	7.1	55-82	69.7 <sup>±</sup> .4	5.2	7.5	55-79	68.8 <sup>±</sup> .4	5.2	7.5	102	50-70	59.7 <sup>±</sup> .9	9.5	15.9
Upper Facial Index(9:8)	41-59	49.1 <sup>±</sup> .4	3.9	8.0	41-60	48.5 <sup>±</sup> .3	3.2	6.5	42-60	49.7 <sup>±</sup> .4	3.8	7.6	41-59	51.1 <sup>±</sup> .3	3.4	6.7	38-59	51.1 <sup>±</sup> .3	3.6	7.1	40-63	51.9 <sup>±</sup> .4	4.3	8.3	41-61	51.0 <sup>±</sup> .3	4.1	8.0	101	37-58	47.4 <sup>±</sup> .4	4.1	8.7
10. Total Facial Height	102-132	116.8 <sup>±</sup> .6	6.9	5.9	106-132	117.5 <sup>±</sup> .5	6.1	5.2	108-138	119.9 <sup>±</sup> .6	6.8	5.7	103-136	120.8 <sup>±</sup> .6	6.7	5.6	103-139	121.0 <sup>±</sup> .5	6.2	5.1	100-134	118.6 <sup>±</sup> .7	8.8	6.1	98-132	118.3 <sup>±</sup> .6	6.9	5.9	88	89-120	103.9 <sup>±</sup> .7	7.0	6.8
Total Facial Index(10:8)	72-100	84.6 <sup>±</sup> .5	5.6	6.6	74-97	84.6 <sup>±</sup> .4	4.6	5.5	76-103	85.7 <sup>±</sup> .5	5.4	6.2	73-99	87.8 <sup>±</sup> .4	5.0	5.7	74-105	88.0 <sup>±</sup> .5	6.1	6.9	72-106	88.1 <sup>±</sup> .5	6.0	6.8	73-102	87.7 <sup>±</sup> .5	6.1	6.9	88	66-98	81.8 <sup>±</sup> .6	5.7	6.9
11. Auriculo-nasion Length	109-126	117.5 <sup>±</sup> .5	4.0	3.4	106-131	117.6 <sup>±</sup> .4	4.5	3.8	104-128	117.7 <sup>±</sup> .4	5.2	4.4	106-133	119.2 <sup>±</sup> .3	3.7	3.1	105-130	119.2 <sup>±</sup> .4	4.9	4.1	108-126	117.8 <sup>±</sup> .3	4.0	3.4	108-126	118.5 <sup>±</sup> .3	3.8	3.2	5	114.6			
12. Auriculo-prosthion Length	115-140	128.1 <sup>±</sup> .4	4.7	3.7	117-146	128.1 <sup>±</sup> .5	5.4	4.2	116-141	128.8 <sup>±</sup> .5	5.5	4.3	119-146	131.1 <sup>±</sup> .4	4.9	3.7	115-142	130.1 <sup>±</sup> .4	4.8	3.7	119-140	129.4 <sup>±</sup> .4	4.8	3.7	117-140	130.2 <sup>±</sup> .4	4.9	3.8	5	123.6			
13. Auriculo-gnathion Length	131-158	146.7 <sup>±</sup> .5	5.3	3.6	131-164	145.4 <sup>±</sup> .5	5.9	4.0	132-163	146.8 <sup>±</sup> .6	6.4	4.4	133-165	147.7 <sup>±</sup> .5	5.5	3.7	133-165	146.5 <sup>±</sup> .4	5.3	3.7	131-157	144.5 <sup>±</sup> .4	5.2	3.6	127-160	145.9 <sup>±</sup> .5	5.7	3.9	5	141.2			
14. Gonion-gnathion Length	95-126	112.0 <sup>±</sup> .6	6.4	5.7	93-127	109.1 <sup>±</sup> .6	6.9	6.3	93-128	109.0 <sup>±</sup> .5	5.8	5.4	93-123	107.5 <sup>±</sup> .5	5.9	5.5	94-124	108.0 <sup>±</sup> .5	5.7	5.2	89-123	110.5 <sup>±</sup> .4	5.4	4.9	92-127	109.3 <sup>±</sup> .6	7.0	6.4	5	105.4			
15. Bi-gonial Width	92-124	109.4 <sup>±</sup> .5	5.5	5.1	95-127	110.7 <sup>±</sup> .5	5.5	5.0	95-124	109.9 <sup>±</sup> .5	5.6	5.1	99-126	112.6 <sup>±</sup> .4	5.3	4.7	99-128	111.7 <sup>±</sup> .4	5.3	4.7	100-123	112.5 <sup>±</sup> .3	4.3	3.8	100-123	112.0 <sup>±</sup> .4	4.8	4.3	25	88-120	101.9 <sup>±</sup> .4	6.9	6.7
Mandibular Index(15:13)	65-87	74.5 <sup>±</sup> .4	4.2	5.7	65-86	76.7 <sup>±</sup> .4	4.2	5.4	67-84	75.5 <sup>±</sup> .4	3.8	5.0	66-84	76.5 <sup>±</sup> .3	3.9	5.1	67-86	76.7 <sup>±</sup> .3	3.7	4.8	65-89	78.1 <sup>±</sup> .3	4.0	5.1	67-89	77.1 <sup>±</sup> .3	3.9	5.0	25	77.6			
16. Bilabial Height	13-36	24.8 <sup>±</sup> .4	4.2	16.7	13-32	23.0 <sup>±</sup> .4	4.4	19.1	13-36	21.4 <sup>±</sup> .5	4.9	22.8	12-35	25.2 <sup>±</sup> .4	4.8	19.2	14-32	22.7 <sup>±</sup> .3	4.2	18.5	13-35	24.3 <sup>±</sup> .3	4.2	17.2	17-32	24.7 <sup>±</sup> .3	3.7	14.9	25	12-26	19.9 <sup>±</sup> .8	3.8	19.0
17. Width of Mouth	47-68	54.8 <sup>±</sup> .3	3.6	6.5	45-61	55.4 <sup>±</sup> .4	4.3	7.8	35-65	55.2 <sup>±</sup> .4	4.1	7.4	45-68	57.8 <sup>±</sup> .3	4.1	7.0	49-65	57.1 <sup>±</sup> .3	3.5	6.1	48-66	57.5 <sup>±</sup> .3	3.5	6.1	47-68	57.7 <sup>±</sup> .3	3.9	6.7	25	43-60	51.2 <sup>±</sup> .9	4.3	8.4
Bilabial Index(16:17)	24-68	45.3 <sup>±</sup> .8	8.6	19.0	21-60	41.4 <sup>±</sup> .7	8.1	19.6	22-62	38.8 <sup>±</sup> .8	8.7	22.3	20-65	44.4 <sup>±</sup> .7	8.6	19.4	22-59	40.0 <sup>±</sup> .6	7.8	19.5	22-63	41.3 <sup>±</sup> .6	7.7	18.7	24-58	42.0 <sup>±</sup> .6	7.2	17.0	25	23-56	36.4 <sup>±</sup> .19	9.5	26.0

TABLE 2, showing the ranges, means, standard deviations and coefficients of variability of 16 FACIAL measurements and indices of the 7 Bantu tribes studied and of the Bushmen. (All measurements in millimeters)

FACE	Tribes arranged in accordance with their means															
	Largest								Smallest							
	Gqum	Fingo	Fingo	Gqum	Sotho	Zulu	Zulu	Zulu	Zulu	Zulu	Zulu	Zulu	Zulu	Zulu	Zulu	Zulu
7. Width of Eyebrow Ridges	3.0	3.6														
8. Maximum Bi-zygomatic Width	2.5															
Eyebrowridge/Bi-zygomatic Index (7:8)	4.6															
9. Upper Facial Height	3.5															
Upper Facial Index(9:8)	3.3	2.5														
10. Total Facial Height	3.1	3.5														
Total Facial Index(10:8)	3.2															
11. Auriculo-nasion Length	2.9															
12. Auriculo-prosthion Length	3.6															
13. Auriculo-gnathion Length	3.1															
14. Gonion-gnathion Length	3.5															
15. Bi-gonial Width	3.2	3.9														
Mandibular Index(15:13)	4.0															
16. Bilabial Height	3.3	6.3	2.6	5.8	3.4	4.9	4.0	4.8	6.5	3.6	4.3	2.6	4.4	5.9	3.6	6.3
17. Width of Mouth	5.3															
Bilabial Index(16:17)	3.6	5.3	2.5	5.8	4.6	2.9	3.2	3.1	2.6	3.3	3.1	2.6	2.8	3.9	4.7	4.5
Total percentage of critical ratios	56.3	37.5	68.8	62.5	56.3	75.0	31.3	31.3	43.8	43.8	43.8	43.8	100.0	44.4	22.2	22.2
Insignificant	37.5	43.8	31.2	25.0	31.2	12.5	37.5	25.0	37.5	31.2	25.0	31.2	55.6	55.6	66.6	88.9
Highly Significant	6.2	18.7		12.5	12.5	12.5	31.2	43.7	18.7	25.0	31.2	25.0	25.0	55.6	55.6	88.9

TABLE 10, showing the CRITICAL RATIOS of the differences between the means of 16 FACIAL measurements and indices of the 7 Bantu tribes studied and of the Bushmen.

Abbreviations: Gqumkwebe = Q, Xhosa = X, Fingo = F, Zulu = Z, Sotho = S, Kwebe = K, Kgalaagadi = KG, Bushmen = B.

were divided arbitrarily into two groups :- A : X-82, B : 83-X, and the percentage distribution is given in Table 11.

Eyebrowridge/Bi-zygomatic Index.

	A (X-82)	B (83-X)
Gqunukwebe :	30.8%	69.2%
Xhosa :	57.0%	43.0%
Fingo :	49.2%	50.8%
Zulu :	48.7%	51.3%
Sotho :	66.0%	34.0%
Kwena :	60.0%	40.0%
Kgalagadi :	55.3%	44.7%
<hr/>		
Bantu Total :	53.1%	46.9%

Table 11. Analysis of the eyebrowridge/bi-zygomatic indices, showing the percentage distribution among the Bantu tribes, after arranging the indices into two groups.

Prominence of the Eyebrow Ridges.— The prominence of the eyebrow ridges was noted in every individual examined, and the observations were divided into three classes :- A : eyebrow ridges absent, B : eyebrow ridges present, C : eyebrow ridges prominent; the percentage distribution has been determined in the 7 Bantu tribes, and the results are presented in Table 12.

Prominence of Eyebrow Ridges

	Eyebrow Ridges		
	<u>A</u> <u>Absent</u>	<u>B</u> <u>Present</u>	<u>C</u> <u>Prominent</u>
Gqunukwebe :	73.3%	17.5%	9.2%
Xhosa :	68.5%	25.3%	6.2%
Fingo :	63.9%	34.1%	2.0%
Zulu :	84.7%	12.7%	2.6%
Sotho :	77.3%	19.7%	3.0%
Kwena :	93.3%	4.7%	2.0%
Kgalagadi :	78.0%	16.0%	6.0%
<u>Bantu Total:</u>	<u>77.7%</u>	<u>18.0%</u>	<u>4.3%</u>

Table 12. Analysis of the prominence of the eyebrow ridges, showing the percentage distribution among the Bantu tribes, after arranging the data into three groups.

Maximum Bi-zygomatic Width, Upper Facial Height, Total Facial Height, Upper Facial Index and Total Facial Index - (Tables 9 and 10).—

The upper facial indices and the total facial indices have been divided into the recognized groups and, after calculating the percentages, the distribution of these two factors in the 7 Bantu tribes and in the Bushmen is shown in Tables 13 and 14.

	<u>Upper Facial Index</u>		
	<u>Euryenic</u> <u>(X-47)</u>	<u>Mesenic</u> <u>(48-52)</u>	<u>Leptenic</u> <u>(53-X)</u>
Gqumukwebe :	40.0%	42.5%	17.5%
Xhosa :	46.2%	46.2%	7.6%
Fingo :	35.8%	45.8%	18.4%
Zulu :	18.0%	50.6%	31.4%
Sotho :	18.0%	56.7%	25.3%
Kwena :	17.3%	39.3%	43.4%
Kgalagadi :	56.4%	32.7%	10.9%
<u>Bantu Total:</u>	<u>27.1%</u>	<u>47.8%</u>	<u>25.1%</u>
Bushmen :	56.4%	32.7%	10.9%

Table 13, showing the percentages of euryeny, meseny and lepteny among the Bantu tribes examined and the Bushmen.

Total Facial Index

	<u>Euryprosopic</u> <u>(X-83)</u>	<u>Mesoprosopic</u> <u>(84-87)</u>	<u>Leptoprosopic</u> <u>(88-X)</u>
Gqunukwebe :	49.2%	27.5%	23.3%
Xhosa :	48.4%	30.8%	20.8%
Fingo :	43.3%	28.3%	28.4%
Zulu :	21.4%	24.0%	54.6%
Sotho :	23.3%	26.0%	50.7%
Kwena :	26.0%	20.7%	53.3%
Kgalagadi :	27.4%	23.3%	49.3%
<hr/>			
Bantu Total:	33.1%	25.6%	41.3%
<hr/>			
Bushmen :	67.2%	15.8%	17.0%

Table 14, showing the percentages of euryprosopy, mesoprosopy and leptoprosopy among the Bantu tribes examined and the Bushmen.

There is no appreciable difference between my figures for the mean upper facial height and the mean upper facial index and those given by Keen (1947) for the South African Bantu, by Martin (1928) for the Congo Bantu, and by Keith (1911) and Seligman (1932) for the Nilotes. In the case of cranial data, adjustments were made to allow for skin thickness as described above.

Auriculo-gnathion Length, Bigonial Width and Mandibular Index, (Tables 9 and 10).—

In skeletal material the mandibular index is calculated from the maximum breadth of the mandible and the maximum length of the mandible. In the living I calculated the mandibular index from the bigonial width and the auriculo-gnathion length, and thus we see that the mandibular index in the living brings into play the width, length and height of the mandible. An analysis has been made of the mandibular index. The indices have been divided arbitrarily into two groups:- A : X-75, B : 76-X, and the percentage distribution of the three groups is given in Table 15.

Mandibular Index.

	A (X-75)	B (76-X)
Gqunukwebe :	66.7%	33.3%
Xhosa :	38.8%	61.2%
Fingo :	57.5%	42.5%
Zulu :	47.3%	52.7%
Sotho :	36.6%	63.4%
Kwena :	27.3%	72.7%
Kgalagadi :	36.0%	64.0%
<hr/>		
Bantu Total:	43.3%	56.7%

Table 15. Analysis of the mandibular indices, showing the percentage distribution among the Bantu tribes, after arranging the indices into two groups.

Bilabial Height, Width of the Mouth, Bilabial Index (Table 9).--

The high coefficients of variability of the bilabial height indicate that this factor is more variable than the width of the mouth. The bilabial indices of the 7 Bantu tribes studied and of the Bushmen have been divided arbitrarily into three groups:-- A : X-39, B : 40-44, C : 45-X, and the percentage distribution is shown in Table 16.

Bilabial Index.

	A (X-39)	B (40-44)	C (45-X)
Gqunukwebe :	26.7%	21.7%	51.6%
Xhosa :	41.5%	28.5%	30.0%
Fingo :	53.4%	23.3%	23.3%
Zulu :	26.0%	22.7%	51.3%
Sotho :	48.7%	26.0%	25.3%
Kwena :	38.0%	28.0%	34.0%
Kgalagadi :	42.0%	24.0%	34.0%
<hr/>			
Bantu Total :	39.4%	25.0%	35.6%
Bushmen :	52.0%	16.0%	32.0%

Table 16. Analysis of the bilabial indices, showing the percentage distribution among the Bantu tribes and the Bushmen, after arranging the indices into three groups.

SECTION 3 - THE NOSE

In Table 17 appear the results of 7 measurements and 4 indices of the nose in the 7 Bantu tribes studied and in the Bushmen. In Table 18 appear the critical ratios of the differences. The tribes have been contrasted in the same groups as for the vault and the facial dimensions and indices in Tables 2 and 10. The skull data available in connection with the nasal dimensions of the Bushmen, could not be made use of in the living, so that only the measurements of 25 living Bushmen were used. As can be seen in Table 17, Bushman data on only four nasal dimensions were available in the literature. A column at the end of Table 18 gives the order in which the tribes are arranged in accordance with their means, the tribes with the largest dimensions being placed to the left, and those with the smallest dimensions to the right. When the critical ratios indicated an insignificant difference, the tribes are bracketed.

Nasal Types in the South African Bantu. — The shape of the nose was noted in every individual examined and the observations were placed into three groups, namely Negro, Hamitic and Bushman-Hottentot; the percentage distribution of the three types has been determined, and the results are shown in Table 19.

Nasal Types in the South African Bantu

	<u>Negro</u>	<u>Hamitic</u>	<u>Bushman-Hottentot</u>
Gqunukwebe :	40%	40%	20%
Xhosa :	42%	55%	3%
Fingo :	42%	54%	4%
Zulu :	38%	60%	2%
Sotho :	43%	50%	7%
Kwena :	50%	37%	13%
Kgalagadi :	36%	32%	32%
<u>Bantu Total:</u>	<u>41.6%</u>	<u>46.7%</u>	<u>11.7%</u>

Table 19, showing the analysis of the nasal shapes observed in the 7 South African Bantu tribes studied, into the three main types - Negro, Hamitic and Bushman-Hottentot.



Orbito-nasal Arc, External Orbital Width and Orbito-nasal Index.—

As can be seen in Table 17, the means for the orbito-nasal arc and the external orbital width vary considerably. The orbito-nasal index has been divided arbitrarily into three groups:— A : X-87, B : 88-90, C : 92-X, and the percentage distribution of the three groups is given in Table 20.

<u>Orbito-nasal Index</u>			
	A (X-87)	B (88-90)	C (92-X)
Gqunukwebe :	17.5%	51.7%	30.8%
Xhosa :	16.9%	59.3%	23.8%
Fingo :	18.3%	59.2%	22.5%
Zulu :	26.0%	60.7%	13.3%
Sotho :	27.3%	47.4%	25.3%
Kwena :	19.3%	57.4%	23.3%
Kgalagadi :	23.3%	49.4%	27.3%
<hr/> Bantu Total :	<hr/> 21.5%	<hr/> 54.9%	<hr/> 23.6%

Table 20. Analysis of the orbito-nasal indices, showing the percentage distribution among the Bantu tribes, after arranging the indices into three groups.

Nasal Root Elevation, Internal Orbital Width and Nasal Root Index.—

The nasal root elevation was taken as twice the difference between the orbito-nasal arc and the external orbital width. The coefficients of variability of the nasal root elevation and the nasal root index indicate that these two nasal features are highly variable (Table 17) in comparison with the other nasal dimensions and indices.

The nasal root index has been divided arbitrarily into two groups :— A : X-69, B : 70-X, and the percentage distribution is given in Table 21.

Nasal Root Index.

	A (X-69)	B (70-X)
Gqunukwebe :	60.0%	40.0%
Xhosa :	47.7%	52.3%
Fingo :	45.0%	55.0%
Zulu :	34.7%	65.3%
Sotho :	30.7%	69.3%
Kwena :	48.7%	51.3%
Kgalagadi :	51.3%	48.7%
<hr/>		
Bantu Total :	44.9%	55.1%

Table 21. Analysis of the nasal root indices, showing the percentage distribution among the Bantu tribes, after arranging the indices into two groups.

Nasal Height, Nasal Width and Nasal Index. — In Table 22 the nasal indices have been divided into the recognized groups and the percentage distribution is indicated.

	Mesorrhine (X-84)	Chamaerrhine (85-99)	Hyperchamaerrhine (100-X)
Gqunukwebe :	18.3%	55.9%	25.8%
Xhosa :	23.1%	57.7%	19.2%
Fingo :	29.2%	58.3%	12.5%
Zulu :	40.0%	49.3%	10.7%
Sotho :	41.3%	51.4%	7.3%
Kwena :	30.0%	52.7%	17.3%
Kgalagadi :	29.3%	56.0%	14.7%
<hr/>			
Bantu Total:	30.7%	54.2%	15.1%
Bushmen :	4.0%	32.0%	64.0%

Table 22, showing the percentages of mesorrhiny, chamaerrhiny and hyperchamaerrhiny among the Bantu tribes examined and the Bushmen.

EAR	120 GQUNUKWEBE				130 XHOSA				120 FINGO				150 ZULU				150 SOTHO				150 KWENA				150 KGALAGADI				BUSHMEN				
	Range	Mean <sup>±</sup> E	σ	C.V.	Range	Mean <sup>±</sup> E	σ	C.V.	Range	Mean <sup>±</sup> E	σ	C.V.	Range	Mean <sup>±</sup> E	σ	C.V.	Range	Mean <sup>±</sup> E	σ	C.V.	Range	Mean <sup>±</sup> E	σ	C.V.	Range	Mean <sup>±</sup> E	σ	C.V.	No.:	Range	Mean <sup>±</sup> E	σ	C.V.
25. Ear Height	43-73	59.5 <sup>±</sup> .4	4.9	8.2	45-73	59.5 <sup>±</sup> .4	4.9	8.1	43-75	61.5 <sup>±</sup> .5	5.1	8.2	48-73	60.6 <sup>±</sup> .4	4.7	7.7	48-71	59.5 <sup>±</sup> .4	4.4	7.4	44-69	57.9 <sup>±</sup> .4	5.0	8.7	46-71	58.1 <sup>±</sup> .4	5.0	8.6	25	47-68	56.6 <sup>±</sup> 1.0	5.0	8.8
26. Ear Width	27-44	36.3 <sup>±</sup> .3	3.2	8.9	25-41	35.8 <sup>±</sup> .3	3.4	9.4	26-46	37.0 <sup>±</sup> .3	3.4	9.2	26-44	35.9 <sup>±</sup> .3	3.0	8.3	29-41	35.5 <sup>±</sup> .2	2.8	8.0	25-39	34.1 <sup>±</sup> .2	2.7	8.1	22-39	33.1 <sup>±</sup> .3	3.0	9.2	25	22-38	31.9 <sup>±</sup> .8	3.9	12.2
Ear Index(27:26)	48-76	61.3 <sup>±</sup> .5	5.2	8.5	43-75	60.5 <sup>±</sup> .5	5.9	9.7	46-76	60.4 <sup>±</sup> .5	5.2	8.5	44-69	59.6 <sup>±</sup> .4	4.7	7.9	46-75	60.2 <sup>±</sup> .4	5.0	8.3	46-75	59.7 <sup>±</sup> .4	5.2	8.7	44-72	57.9 <sup>±</sup> .5	5.6	9.6	25	36-66	56.3 <sup>±</sup> 1.3	6.6	11.7
27. Height of Ear Lobe	9-21	15.6 <sup>±</sup> .3	2.7	17.6	8-19	15.0 <sup>±</sup> .2	2.3	16.5	8-23	15.5 <sup>±</sup> .2	1.9	12.2	11-26	15.6 <sup>±</sup> .2	2.6	16.8	8-22	14.2 <sup>±</sup> .3	2.4	16.8	7-19	13.0 <sup>±</sup> .2	2.4	18.3	9-19	13.2 <sup>±</sup> .2	2.3	16.9	5		10.6		
28. Height of Ear Base	37-63	50.2 <sup>±</sup> .4	4.6	9.3	38-65	49.3 <sup>±</sup> .4	4.7	9.5	41-61	51.5 <sup>±</sup> .4	4.1	7.9	39-62	49.9 <sup>±</sup> .3	4.0	8.0	36-60	48.1 <sup>±</sup> .3	4.2	8.7	36-59	48.8 <sup>±</sup> .4	4.7	9.7	39-64	49.0 <sup>±</sup> .4	5.0	10.2	5		42.4		
Ear Base Index(28:25)	72-102	85.2 <sup>±</sup> .5	5.4	6.4	71-99	84.1 <sup>±</sup> .5	5.6	6.6	67-98	83.5 <sup>±</sup> .5	5.6	6.8	67-98	82.9 <sup>±</sup> .5	5.5	6.7	65-93	81.2 <sup>±</sup> .4	5.0	6.2	68-108	85.1 <sup>±</sup> .6	6.8	7.9	63-105	84.8 <sup>±</sup> .6	6.7	7.9	5		84.2		

TABLE 23. showing the ranges, means, standard deviations and coefficients of variability of 6 EAR measurements and indices of the 7 Bantu tribes studied and of the Bushmen.

(All measurements in millimeters)

SECTION 4 - THE EAR

In Table 23 appear the results of 4 measurements and 2 indices of the ear in the 7 Bantu tribes studied and in the Bushmen. In Table 24 appear the critical ratios of the differences. The tribes were contrasted in the same groups as for the vault, facial and nasal dimensions and indices in Tables 2, 10 and 18. Data on two ear dimensions were not available for the Bushmen. At the end of Table 24 is a column giving the order of the tribes arranged in the same way as in Tables 2, 10 and 18.

Ear Height (also called Total Ear Height or Physionomic Ear Height).—

In Table 25 the ear heights have been divided into the recognized groups and the percentage distribution is indicated.

	<u>Ear Height</u>			
	: <u>Hypermicrotic</u> (X-54 mm.)	<u>Microtic</u> (55-59 mm.)	<u>Mesotic</u> (60-64)	<u>Macrotic</u> (65-X mm.)
Gqunukwebe	: 16.7%	35.8%	34.2%	13.3%
Xhosa	: 16.2%	36.9%	36.2%	10.7%
Fingo	: 7.5%	21.7%	50.0%	20.8%
Zulu	: 13.3%	32.7%	38.0%	16.0%
Sotho	: 16.0%	35.3%	40.0%	8.7%
Kwena	: 34.0%	36.7%	23.3%	6.0%
Kgalagadi	: 24.7%	44.0%	22.6%	8.7%
<u>Bantu Total</u>	: <u>18.8%</u>	<u>35.0%</u>	<u>34.4%</u>	<u>11.8%</u>
Bushmen	: 36.0%	60.0%	4.0%	0.0%

Table 25, showing the percentages of hypermicroty, microty, mesoty and macroty among the Bantu tribes examined and the Bushmen.

Ear Width (also called Physionomic Ear Width) and Ear Index.—

The ear indices have been divided arbitrarily into three groups: A : X-57, B : 58-61, C : 62-X, and the

EAR	Gqun	Fingo	Fingo	Gqun	Kwena	Zulu	Zulu	Zulu	Zulu	Sotho	Kwena	K g a l a g a d i					B u s h m e n					Tribes arranged in accordance with their means Largest (F Z X Q S Kg K B) smallest		
	Xhosa	Zulu	Xhosa	Fingo	Sotho	Sotho	Xhosa	Gqun	Kwena	Xhosa	Xhosa	Gqun	Xhosa	Fingo	Zulu	Sotho	Kwena	Gqun	Xhosa	Fingo	Zulu		Sotho	Kwena
25. Ear Height			3.2	3.3	3.4				5.5		3.2		5.5	4.5				2.7	2.6	4.4	3.5	2.7		
26. Ear Width		2.9	3.0		4.3				5.3		4.4	8.3	6.7	9.8	7.4	6.7	2.9	5.4	4.7	6.1	4.9	4.4	2.7	
Ear Index(27:26)								2.6				5.1	3.7	3.9	2.9	3.7	3.0	3.5	2.9	2.9		2.8	2.5	
27. Height of Ear Lobe					3.5	3.7			9.2		6.7	7.5	6.1	9.2	8.5	2.7								
28. Height of Ear Base		3.1	4.0			3.8								4.5										
Ear Base Index(28:25)					5.6				3.5	3.2	4.6					5.1								
Total percentage of critical ratios																								
Insignificant	100.0	66.7	50.0	83.3	33.3	66.7	100.0	66.7	33.3	83.3	50.0	50.0	50.0	16.7	33.3	33.4	66.7	50.0	50.0	50.0	66.6	50.0	66.7	100.0
Significant		33.3	50.0	16.7	50.0	33.3		33.3	16.7		16.7		16.7	16.7	16.7	33.3	33.3	33.3	33.3	16.7	16.7	33.3	33.3	
Highly Significant					16.7				50.0	16.7	33.3	50.0	33.3	66.6	50.0	33.3		16.7	16.7	33.3	16.7	16.7		

TABLE 24, showing the CRITICAL RATIOS of the differences between the means of 6 EAR measurements and indices in the 7 Bantu tribes studied and in the Bushmen.

Abbreviations: Gqunukwebe = Q, Xhosa = X, Fingo = F, Zulu = Z, Sotho = S, Kwena = K, Kgalagadi = Kg, Bushmen = B.

percentage distribution of the three groups is given in Table 26.

	<u>Ear Index</u>		
	A (X-57)	B (58-61)	C (62-X)
Gqunukwebe :	26.7%	33.3%	40.0%
Xhosa :	35.4%	21.5%	43.1%
Fingo :	32.5%	30.8%	36.7%
Zulu :	34.0%	36.7%	29.3%
Sotho :	29.3%	40.0%	30.7%
Kwena :	44.7%	26.6%	28.7%
Kgalagadi :	50.7%	28.7%	20.6%
<hr/>			
Bantu Total :	36.6%	31.2%	32.2%
Bushmen :	64.0%	20.0%	16.0%

Table 26. Analysis of the ear indices, showing the percentage distribution among the Bantu tribes and the Bushmen, after arranging the indices into three groups.

Height of Ear Lobule. — Three main types of ear lobules were observed amongst the Bantu and the Bushmen :- A) The well developed and unattached, with a convex lower edge; B) The well developed and attached; C) The practically absent lobule, where the cartilage of the helix continues obliquely below the incisura intertragica or stops short altogether. In types A and B the height of the lobule is taken as the distance between the lowest point on the incisura intertragica and a line touching the tip of the lobule horizontally; in type C the height of the "lobule" is nevertheless given as the distance between the lowest point on the incisura intertragica and a point on the lower edge vertically below it. The oblique "lobule" in this case may measure as much in height as type A.

Observations were made of the 3 main types present in the Bantu and the Bushmen, and the percentages are given in Table 27.

Types of Ear Lobules

	A Well developed, unattached	B Well developed, attached	C Lobule practi- cally absent
Gqunukwebe :	36%	24%	40%
Xhosa :	48%	19%	33%
Fingo :	64%	13%	23%
Zulu :	69%	11%	20%
Sotho :	67%	20%	13%
Kwena :	24%	34%	42%
Kgalagadi :	34%	16%	50%
<hr/>			
Bantu Total :	48.8%	19.7%	31.5%
<hr/>			
Bushmen :	4%	8%	88%

Table 27. Analysis of the three main types of ear lobules present in the Bantu tribes and in the Bushmen; the numbers have been arranged into three groups, A, B, and C, and the percentage distribution calculated.

Height of Ear Base (also called Height of Ear Attachment) and Ear Base Index. —

The ear base indices have been divided arbitrarily into two groups :- A : X-83, B : 84-X, and the percentage distribution is given in Table 28.

Ear Base Index

	A (X-83)	B (84-X)
Gqunukwebe :	32.9%	67.1%
Xhosa :	46.2%	53.8%
Fingo :	52.7%	47.3%
Zulu :	55.3%	44.7%
Sotho :	72.0%	28.0%
Kwena :	38.7%	61.3%
Kgalagadi :	44.0%	56.0%
<hr/>		
Bantu Total :	57.8%	42.2%

Table 28. Analysis of the ear base indices, showing the percentage distribution among the Bantu tribes, after arranging the indices into two groups.

TRUNK	120 GQUNUKWEBE				130 XHOSA				120 FINGO				150 ZULU				150 SOTHO				150 KWENA				150 KQALAGAPI				BUSHMEN				
	Range	Mean <sup>±</sup> E	σ	C.V.	Range	Mean <sup>±</sup> E	σ	C.V.	Range	Mean <sup>±</sup> E	σ	C.V.	Range	Mean <sup>±</sup> E	σ	C.V.	Range	Mean <sup>±</sup> E	σ	C.V.	Range	Mean <sup>±</sup> E	σ	C.V.	Range	Mean <sup>±</sup> E	σ	C.V.	No.	Range	Mean <sup>±</sup> E	σ	C.V.
29. Stature	1553-1838	1684.6 <sup>±</sup> 5.3	57.9	3.4	1539-1861	1675.2 <sup>±</sup> 5.4	61.7	3.7	1521-1927	1673.5 <sup>±</sup> 5.9	64.2	3.8	1511-1832	1676.8 <sup>±</sup> 5.5	67.4	4.0	1533-1900	1675.0 <sup>±</sup> 6.6	80.2	4.8	1477-1913	1683.5 <sup>±</sup> 5.7	69.2	4.1	1529-1810	1674.3 <sup>±</sup> 5.2	63.2	3.9	25	1441-1692	1611.5 <sup>±</sup> 11.1	55.5	3.4
30. Sitting Height	783-937	858.9 <sup>±</sup> 2.8	30.4	3.5	773-924	853.0 <sup>±</sup> 2.8	32.4	3.8	769-931	856.5 <sup>±</sup> 2.7	30.7	3.5	754-939	849.3 <sup>±</sup> 3.0	37.1	4.1	773-919	840.3 <sup>±</sup> 2.6	31.3	3.7	742-955	847.1 <sup>±</sup> 2.8	34.7	4.1	773-919	840.0 <sup>±</sup> 2.7	32.8	3.9	5		795.2		
Sitting Height/Stature Index(30:29)	46-55	51.4 <sup>±</sup> .1	1.5	2.8	48-54	51.3 <sup>±</sup> .1	1.3	2.5	47-54	51.5 <sup>±</sup> .1	1.4	2.7	46-54	51.0 <sup>±</sup> .1	1.3	2.5	47-54	50.5 <sup>±</sup> .1	1.2	2.4	47-54	50.8 <sup>±</sup> .1	1.4	2.7	43-53	50.5 <sup>±</sup> .1	2.9	5.0	5		50.0		
31. Bi-acromial Width	329-418	380.9 <sup>±</sup> 1.7	18.9	5.0	338-443	383.6 <sup>±</sup> 1.8	20.8	5.4	321-450	380.3 <sup>±</sup> 1.9	20.2	5.3	328-433	382.5 <sup>±</sup> 1.7	20.2	5.3	332-433	381.8 <sup>±</sup> 1.3	18.5	4.8	334-419	378.5 <sup>±</sup> 1.4	17.7	4.7	313-420	374.3 <sup>±</sup> 1.5	5.0	2.5	25	290-360	343.1 <sup>±</sup> 3.2	16.2	4.7
Bi-acromial/Sitting Height Index(31:30)	39-50	44.7 <sup>±</sup> .2	2.4	5.3	39-52	45.4 <sup>±</sup> .2	2.1	4.5	38-50	44.8 <sup>±</sup> .2	2.3	5.1	39-50	45.4 <sup>±</sup> .2	2.1	4.6	39-51	45.7 <sup>±</sup> .2	2.4	5.2	39-52	45.0 <sup>±</sup> .2	2.1	4.6	38-51	44.6 <sup>±</sup> .2	2.2	4.8	5		42.0		
32. Bi-cristal Width	231-298	260.5 <sup>±</sup> 1.2	13.5	5.2	220-298	263.1 <sup>±</sup> 1.2	13.2	5.0	229-302	264.0 <sup>±</sup> 1.4	15.5	5.9	228-294	260.9 <sup>±</sup> 1.1	13.3	5.1	227-301	263.0 <sup>±</sup> 1.2	15.0	5.6	219-288	251.9 <sup>±</sup> 1.2	14.2	5.6	203-295	249.1 <sup>±</sup> 1.1	14.0	5.6	25	215-260	239.1 <sup>±</sup> 2.3	11.5	4.8
Bi-cristal/Sitting Height Index(32:30)	26-35	30.2 <sup>±</sup> .2	1.6	5.5	26-36	31.0 <sup>±</sup> .1	1.6	5.2	21-35	31.1 <sup>±</sup> .2	1.8	5.7	27-34	31.0 <sup>±</sup> .1	1.6	5.1	27-36	31.5 <sup>±</sup> .1	1.7	5.3	26-36	30.0 <sup>±</sup> .1	1.5	5.1	26-36	30.0 <sup>±</sup> .1	1.6	5.3	5		28.4		
33. Transverse Chest Diameter	218-285	255.7 <sup>±</sup> 1.2	13.2	5.1	218-301	256.7 <sup>±</sup> 1.1	15.4	6.0	211-300	254.9 <sup>±</sup> 1.3	14.3	6.4	223-297	256.8 <sup>±</sup> 1.1	13.9	5.4	218-308	261.3 <sup>±</sup> 1.6	19.4	7.4	219-305	255.2 <sup>±</sup> 1.1	13.9	5.5	219-302	254.5 <sup>±</sup> 1.1	13.2	5.2	25	215-260	239.1 <sup>±</sup> 2.3	11.5	4.8
34. Sagittal Chest Diameter	163-225	196.4 <sup>±</sup> 1.2	13.0	6.6	164-238	195.3 <sup>±</sup> 1.2	13.7	7.0	164-247	196.8 <sup>±</sup> 1.3	14.5	6.9	165-231	194.1 <sup>±</sup> 1.0	12.3	6.2	165-247	204.1 <sup>±</sup> 1.2	14.9	7.3	150-232	191.2 <sup>±</sup> 1.1	13.1	6.9	164-253	193.3 <sup>±</sup> 1.0	6.1	2.5	25	165-225	192.7 <sup>±</sup> 2.7	13.7	7.1
Thoracic Index(34:33)	65-91	76.3 <sup>±</sup> .4	5.7	7.5	63-96	76.4 <sup>±</sup> .5	5.5	7.3	61-93	77.4 <sup>±</sup> .6	5.9	7.3	65-90	76.1 <sup>±</sup> .4	1.8	7.0	62-93	78.6 <sup>±</sup> .4	5.4	6.9	59-93	75.7 <sup>±</sup> .5	5.6	7.3	63-94	76.5 <sup>±</sup> .4	4.6	6.1	25	71-102	81.7 <sup>±</sup> 1.5	7.6	9.3

TABLE 29, showing the means, standard deviations and coefficients of variability of 10 TRUNK measurements and indices of the 7 Bantu tribes studied and of the Bushmen.

TRUNK	Gqun : Fingo : Fingo : Gqun : Sotho : Zulu : Zulu : Zulu : Zulu : Sotho : Kwena : Xhosa : Zulu : Xhosa : Fingo : Kwena : Sotho : Xhosa : Gqun : Kwena : Xhosa : Xhosa											K g a l a g a d i Gqun : Xhosa : Fingo : Zulu : Sotho : Kwena					B u s h m e n Gqun : Xhosa : Fingo : Zulu : Sotho : Kwena : Kgal					Tribes arranged in accordance with their means			
29. Stature																		5.9	5.2	4.9	5.3	4.9	5.7	5.1	Largest (Q K Z X S Kg F) B Smallest
30. Sitting Height																									(Q F X Z K S Kg)
Sitting Height/Stature Index(30:29)																									
31. Bi-acromial Width																									(X Z S Q F K Kg) B
Bi-acromial/Sitting Height Index(31:30)																									
32. Bi-cristal Width																									(F X S Z Q) (K Kg) B
Bi-cristal/Sitting Height Index(32:30)																									
33. Transverse Chest Diameter																									(S Z X K Q F Kg) B
34. Sagittal Chest Diameter																									(S F Q X Z Kg K B)
Thoracic Index (34:33)																									
Total percentage of critical ratios																									
Insignificant	80.0	90.0	100.0	90.0	40.0	70.0	100.0	80.0	80.0	50.0	70.0	60.0	40.0	50.0	50.0	30.0	100.0	16.7	16.7	16.7	16.7	16.7	16.7	16.7	
Significant	20.0	10.0		10.0	30.0	30.0		20.0	40.0	10.0	10.0	10.0	30.0	20.0	30.0	50.0		16.6	16.6	16.6	16.6	16.6	16.6	16.6	
Highly Significant					30.0			20.0	10.0	20.0	20.0	30.0	30.0	30.0	20.0	20.0		66.7	66.7	66.7	66.7	66.7	66.7	66.7	

Abbreviations: Gqunukwebe = Q,  
Xhosa = X, Fingo = F, Zulu = Z,  
Sotho = S, Kwena = K,  
Kgalagadi = Kg, Bushmen = B.

TABLE 30, showing the CRITICAL RATIOS of the differences between the means of 10 TRUNK measurements and indices of the 7 Bantu tribes studied and of the Bushmen.

SECTION 5 - THE TRUNK

In Table 29 appear the results of 6 measurements and 4 indices of the trunk in the 7 Bantu tribes studied and in the Bushmen. Data on the sitting height of the Bushmen were not available. In Table 30 appear the critical ratios of the differences. The tribes were contrasted in the same groups as for the vault, facial, nasal and ear dimensions and indices in Tables 2, 10, 18 and 24. At the end of Table 30 is a column giving the order of the tribes arranged in accordance with their means and they are bracketed in the same way as in Tables 2, 10, 18 and 24.

Stature. -- The means for the stature in all the groups studied are extraordinarily alike and statistically show no significant differences. The mean Bushman stature is considerably lower (Tables 29 and 30). In Table 31 the statures have been divided into the recognized groups and the percentage distribution is indicated.

<u>Stature.</u>			
	Low (X-1599 mm.)	Medium (1600-1699 mm.)	High (1700 mm.-X)
Gqumukwebe :	7.5%	53.3%	39.2%
Xhosa :	13.1%	53.8%	33.1%
Fingo :	14.1%	54.2%	31.7%
Zulu :	12.0%	50.7%	37.3%
Sotho :	18.0%	57.3%	24.7%
Kwena :	10.0%	56.0%	34.0%
Kgalagadi :	18.0%	44.0%	38.0%
<hr/>			
<u>Bantu Total :</u>	<u>13.4%</u>	<u>52.7%</u>	<u>33.9%</u>
Bushmen :	60.0%	40.0%	0.0%

Table 31, showing the percentages of low, medium and high statures among the Bantu tribes examined and the Bushmen.

Sitting Height.— The sitting height has been divided arbitrarily into two groups:— A : X-849 mm., B : 850 - X mm., and the percentage distribution is given in Table 32.

Sitting Height.

	<u>A</u> (X-849 mm.)	<u>B</u> (850 - X mm.)
Gqunukwebe :	35.0%	65.0%
Xhosa :	43.1%	56.9%
Fingo :	44.2%	55.8%
Zulu :	46.7%	53.3%
Sotho :	60.7%	39.3%
Kwena :	54.7%	45.3%
Kgalagadi :	64.0%	36.0%
<hr/>		
Bantu Total:	50.5%	49.5%

Table 32. Analysis of the sitting heights, showing the percentage distribution among the Bantu tribes, after arranging the dimensions into two groups.

Sitting Height/Stature Index. — The sitting height/stature indices have been divided arbitrarily into two groups:— A : X-50, B : 51-X, and the percentage distribution is given in Table 33.

Sitting Height/Stature Index.

	<u>A</u> (X-50)	<u>B</u> (51-X)
Gqunukwebe :	40.8%	59.2%
Xhosa :	34.6%	65.4%
Fingo :	27.5%	72.5%
Zulu :	40.7%	59.3%
Sotho :	39.3%	60.7%
Kwena :	57.3%	42.7%
Kgalagadi :	57.3%	42.7%
<hr/>		
Bantu Total:	43.2%	56.8%

Table 33. Analysis of the sitting height/stature indices, showing the percentage distribution among the Bantu tribes, after arranging the indices into two groups.

Bi-acromial Width, Bi-cristal Width (also called Pelvis Width) and related indices. —

As regards their bi-acromial widths, the Kgalagadi mean is significantly less than those of all the other groups except that of the Kwena (Tables 29 and 30). In their bi-cristal widths the Kgalagadi as well as the Kwena means are considerably less than those of the other tribes (Tables 29 and 30). The bi-cristal/sitting height indices have been divided arbitrarily into two groups :- A : X-30, B : 31-X, and the percentage distribution is given in Table 34.

Bi-cristal/Sitting Height Index.

	A (X-30)	B (31-X)
Gqunukwebe :	55.0%	45.0%
Xhosa :	50.8%	49.2%
Fingo :	43.3%	56.7%
Zulu :	51.3%	48.7%
Sotho :	30.7%	69.3%
Kwena :	71.3%	28.7%
Kgalagadi :	72.0%	28.0%
<hr/>		
Bantu Total:	53.8%	46.2%

Table 34. Analysis of the bi-cristal/sitting height indices, showing the percentage distribution among the Bantu tribes, after arranging the indices into two groups.

Transverse Chest Diameter, Sagittal Chest Diameter and Thoracic Index. —

The relation between the sagittal chest diameter and the transverse diameter differs considerably in Bantu and Bushman (Tables 29 and 30). The thoracic indices have been divided arbitrarily into two groups :- A : X-76, B : 77-X, and the percentage distribution is given in Table 35.

Thoracic Index.

	<u>A</u> <u>(X-76)</u>	<u>B</u> <u>(77-X)</u>
Gqunukwebe :	56.9%	43.1%
Khosa :	50.0%	50.0%
Fingo :	60.0%	40.0%
Zulu :	60.7%	39.3%
Sotho :	39.3%	60.7%
Kwena :	69.3%	30.7%
Kgalagadi :	52.7%	47.3%
<hr/>		
<u>Bantu Total:</u>	<u>55.6%</u>	<u>44.4%</u>
Bushmen :	28.0%	72.0%

Table 35. Analysis of the thoracic indices, showing the percentage distribution among the Bantu tribes examined and in the Bushmen, after arranging the indices into two groups.

SECTION 6 - THE LIMBS.

In Table 36 appear the results of 16 measurements and 9 indices of the limbs in the 7 Bantu tribes studied. With the exception of one dimension, no data were available on the Bushmen. In Table 37 appear the critical ratios of the differences. The tribes were contrasted in the same groups as for the vault, facial, nasal, ear and trunk dimensions and indices in Tables 2, 10, 18, 24 and 30. At the end of Table 37 is a column giving the order of the tribes arranged in the same way as in the above mentioned tables.

Length of Tibia.— The tibial lengths have been divided arbitrarily into two groups :- A : X-406, B : 407-X, and the percentage distribution is given in Table 38.

	<u>Length of Tibia</u>	
	A (X-406 mm.)	B (407 mm.-X)
Gqunukwebe :	48.3%	51.7%
Xhosa :	59.2%	40.8%
Fingo :	55.8%	44.2%
Zulu :	49.3%	50.7%
Sotho :	64.0%	36.0%
Kwena :	30.7%	69.3%
Kgalagadi :	49.5%	56.0%
<hr/>		
Bantu Total:	50.0%	50.0%

Table 38. Analysis of the tibial lengths, showing the percentage distribution among the tribes examined, after arranging the dimensions into two groups.

Leg Length. — The leg length was obtained by adding an average of 35 mm. to the symphyseal height (Martin, 1928)

LIMBS	120 GQUNUKWEBE				130 XHOSA				120 FINGO				150 ZULU				150 SOTHO				150 KWRINA				150 KGALAGADI				BUSHMEN				
	Range	Mean- $\bar{x}$	$\sigma$	C.V.	Range	Mean- $\bar{x}$	$\sigma$	C.V.	Range	Mean- $\bar{x}$	$\sigma$	C.V.	Range	Mean- $\bar{x}$	$\sigma$	C.V.	Range	Mean- $\bar{x}$	$\sigma$	C.V.	Range	Mean- $\bar{x}$	$\sigma$	C.V.	Range	Mean- $\bar{x}$	$\sigma$	C.V.	No.:	Range	Mean- $\bar{x}$	$\sigma$	C.V.
35. Length of Femur(38-36-37)	319-534	459.9 $\pm$ 2.5	27.5	6.0	467-535	455.5 $\pm$ 2.2	25.5	5.6	399-577	453.0 $\pm$ 2.4	26.5	5.9	373-503	444.1 $\pm$ 2.0	25.0	5.6	386-520	445.9 $\pm$ 2.1	25.9	5.8	395-532	453.6 $\pm$ 2.2	26.5	5.8	380-526	443.5 $\pm$ 2.1	26.1	5.9	5	418.6			
36. Length of Tibia	355-458	408.4 $\pm$ 2.0	21.4	5.2	347-471	402.5 $\pm$ 1.9	22.0	5.5	355-510	402.4 $\pm$ 2.1	24.1	6.0	350-468	406.7 $\pm$ 1.9	23.8	6.0	347-479	401.0 $\pm$ 1.8	21.5	5.0	355-483	418.3 $\pm$ 2.0	25.0	6.0	347-472	410.5 $\pm$ 2.0	24.1	5.9	5	386.2			
37. Height of Foot	46-86	67.7 $\pm$ .4	8.3	12.2	52-87	68.9 $\pm$ .6	7.2	10.4	48-84	67.6 $\pm$ .7	7.6	11.3	47-87	66.3 $\pm$ .6	7.6	11.4	44-82	65.0 $\pm$ .6	7.9	12.1	44-82	64.4 $\pm$ .6	7.8	12.0	44-80	64.1 $\pm$ .6	7.3	11.3	5	59.2			
38. Leg Length (Symphyseal Height+35 mm.)	830-1061	933.8 $\pm$ 3.9	43.0	4.6	838-1061	925.1 $\pm$ 4.0	45.1	4.9	815-1152	921.9 $\pm$ 4.5	48.8	4.8	810-1035	916.0 $\pm$ 3.8	45.9	5.0	822-1034	910.7 $\pm$ 3.5	43.4	5.8	830-1069	934.6 $\pm$ 3.6	44.6	4.8	796-1031	917.5 $\pm$ 3.9	48.1	5.2	5	864.0			
39. Femoro-tibial Length (35+36)	758-958	865.8 $\pm$ 3.8	41.6	4.8	774-983	856.4 $\pm$ 3.9	44.6	5.2	761-1087	854.6 $\pm$ 4.3	46.8	5.5	748-971	849.0 $\pm$ 3.8	46.1	5.4	759-982	846.0 $\pm$ 3.5	42.6	5.0	770-1001	871.1 $\pm$ 3.9	47.2	5.6	733-975	854.0 $\pm$ 3.9	47.6	5.4	5	804.8			
Sitting Height/Leg Length Index(30:38)	82-106	92.6 $\pm$ .4	4.8	5.2	81-102	92.9 $\pm$ .4	4.0	4.3	78-102	93.7 $\pm$ .4	4.4	4.7	80-102	93.7 $\pm$ .3	4.1	4.3	81-109	93.1 $\pm$ .3	4.1	4.5	81-103	94.2 $\pm$ .4	4.3	4.6	83-103	91.7 $\pm$ .3	3.8	4.2	5	92.2			
40. Foot Length	234-297	263.9 $\pm$ 1.1	11.8	4.5	233-304	260.5 $\pm$ 1.1	13.1	5.0	225-301	261.8 $\pm$ 1.1	12.6	4.7	231-285	264.4 $\pm$ 1.0	11.8	4.5	222-299	259.2 $\pm$ 1.0	12.6	4.9	233-304	261.8 $\pm$ 1.0	12.5	4.8	207-287	257.8 $\pm$ 1.1	13.3	5.4	5	231.2			
41. Foot Width	92-122	106.7 $\pm$ .5	6.2	5.8	85-135	105.7 $\pm$ .6	6.7	6.6	91-120	106.1 $\pm$ .6	6.4	6.0	89-135	106.5 $\pm$ .6	6.7	6.3	85-120	104.5 $\pm$ .5	6.4	6.1	83-117	101.2 $\pm$ .5	6.2	6.2	79-118	100.4 $\pm$ .7	7.2	7.1	5	86.6			
Foot Index(41:40)	35-48	41.1 $\pm$ .2	2.3	5.7	34-45	40.8 $\pm$ .2	2.0	4.8	35-46	41.0 $\pm$ .2	2.1	4.2	36-48	40.7 $\pm$ .2	2.3	5.6	34-44	40.0 $\pm$ .2	2.0	5.1	31-46	39.1 $\pm$ .2	2.4	6.1	32-45	39.3 $\pm$ .2	2.3	5.8	5	37.4			
42. Armspan	1585-1978	1782.2 $\pm$ 6.5	71.6	4.1	1621-2009	1775.4 $\pm$ 7.1	80.1	4.5	1597-2045	1773.1 $\pm$ 7.4	81.0	4.6	1575-2018	1784.8 $\pm$ 6.9	84.2	4.7	1579-1990	1756.3 $\pm$ 6.3	77.3	4.4	1565-1786	1784.6 $\pm$ 6.8	83.6	4.7	1493-1965	1761.2 $\pm$ 7.1	87.2	5.0	5	1606.8			
Stature/Armspan Index(42:29)	90-101	95.2 $\pm$ .2	2.4	2.5	87-98	95.0 $\pm$ .2	2.2	2.3	89-99	94.9 $\pm$ .2	2.1	2.2	89-100	94.6 $\pm$ .2	2.3	2.4	89-105	94.8 $\pm$ .2	2.5	2.6	89-99	94.9 $\pm$ .3	3.1	3.3	89-104	95.6 $\pm$ .2	2.5	2.6	5	99.0			
43. Length of Humerus	263-368	319.9 $\pm$ 1.5	16.8	5.3	263-368	323.1 $\pm$ 1.7	19.2	5.6	265-382	317.2 $\pm$ 1.8	19.3	6.1	260-364	316.6 $\pm$ 1.5	18.5	5.9	277-355	311.4 $\pm$ 1.3	16.4	5.3	272-370	319.4 $\pm$ 1.5	18.1	5.1	270-361	318.7 $\pm$ 1.5	18.2	5.1	5	286.2			
44. Length of Radius	227-288	259.0 $\pm$ 1.2	12.9	5.0	228-310	257.3 $\pm$ 1.3	14.6	5.7	228-303	256.5 $\pm$ 1.4	15.1	5.9	217-292	259.0 $\pm$ 1.2	14.9	5.7	217-297	259.0 $\pm$ 1.2	14.3	5.5	232-302	265.0 $\pm$ 1.4	17.0	6.4	217-303	258.2 $\pm$ 1.3	16.4	6.3	5	236.8			
45. Hand Length	168-208	191.7 $\pm$ .8	9.1	4.7	165-218	190.1 $\pm$ .8	9.5	5.0	160-224	192.4 $\pm$ .8	9.2	4.8	168-225	192.8 $\pm$ .8	9.5	4.9	165-217	189.8 $\pm$ .8	10.1	5.3	164-221	189.0 $\pm$ .8	9.8	5.2	137-214	186.7 $\pm$ .9	11.0	5.9	5	162.2			
46. Arm Length (43+44+45)	688-850	770.7 $\pm$ 2.8	31.2	4.0	690-983	766.6 $\pm$ 3.3	37.8	4.8	679-909	765.1 $\pm$ 3.3	36.0	4.7	657-870	767.8 $\pm$ 3.1	38.0	4.9	640-897	759.4 $\pm$ 3.0	37.3	4.9	670-881	773.7 $\pm$ 3.2	38.8	5.0	640-897	765.1 $\pm$ 3.5	42.6	5.6	25	640-787	700.9 $\pm$ 5.9	29.4	4.0
47. Humero-radial Length (43+44)	495-646	579.5 $\pm$ 2.0	21.5	3.7	513-675	575.4 $\pm$ 2.7	31.2	5.4	496-685	572.7 $\pm$ 3.0	32.5	5.7	477-649	573.8 $\pm$ 2.6	32.2	5.6	512-648	569.3 $\pm$ 2.3	28.5	5.0	504-672	584.6 $\pm$ 2.6	31.8	5.4	498-645	577.9 $\pm$ 2.6	32.2	5.6	5	523.2			
Arm Length/Sitting Height Index(46:30)	78-99	90.2 $\pm$ .4	4.3	4.7	82-101	90.2 $\pm$ .4	4.2	4.6	79-101	89.9 $\pm$ .4	3.9	4.4	80-106	91.0 $\pm$ .3	4.0	4.3	79-102	90.4 $\pm$ .4	4.3	4.7	81-102	91.8 $\pm$ .3	4.2	4.5	82-100	91.6 $\pm$ .3	4.2	4.5	5	86.4			
Radio/Humeral Index (44:43)	73-88	81.4 $\pm$ .3	3.5	4.3	68-89	80.8 $\pm$ .3	3.4	4.2	74-92	81.5 $\pm$ .3	3.5	4.3	74-92	82.2 $\pm$ .3	3.3	4.1	74-92	83.3 $\pm$ .3	3.4	4.1	76-93	83.5 $\pm$ .3	3.4	4.1	75-91	82.3 $\pm$ .3	3.1	3.8	5	82.8			
Fore-arm Index (45:44)	66-82	74.0 $\pm$ .3	3.4	4.6	66-84	74.4 $\pm$ .3	2.9	3.8	65-83	75.8 $\pm$ .3	3.6	4.8	66-85	74.9 $\pm$ .3	3.5	4.7	65-84	73.9 $\pm$ .3	3.9	5.2	62-78	71.9 $\pm$ .3	3.5	4.9	61-85	72.2 $\pm$ .3	3.7	5.2	5	68.8			
Arm Length/Leg Length Index(46:38)	76-88	83.1 $\pm$ .3	3.2	3.2	76-89	83.4 $\pm$ .2	2.3	2.8	78-88	83.6 $\pm$ .2	2.4	2.9	78-89	84.1 $\pm$ .2	2.2	2.5	71-92	84.1 $\pm$ .2	2.4	2.9	75-88	83.2 $\pm$ .2	2.3	2.7	74-95	84.1 $\pm$ .2	2.5	3.0	5	79.4			
48. Hand Width	79-96	87.2 $\pm$ .4	4.2	4.8	74-105	86.0 $\pm$ .4	4.6	5.4	73-95	85.8 $\pm$ .4	4.5	5.2	75-94	86.1 $\pm$ .3	4.1	4.8	71-98	85.3 $\pm$ .4	4.5	5.4	68-95	83.1 $\pm$ .3	4.0	4.8	69-98	83.7 $\pm$ .4	4.9	5.8	5	72.6			
Hand Index (48:45)	40-53	45.8 $\pm$ .2	2.3	4.9	39-52	45.5 $\pm$ .2	2.5	5.6	38-51	45.2 $\pm$ .2	2.4	5.3	38-50	44.9 $\pm$ .2	2.4	5.4	40-51	45.4 $\pm$ .2	2.2	4.9	39-50	44.3 $\pm$ .2	2.3	5.1	39-51	45.2 $\pm$ .2	2.4	5.2	5	44.8			
49. Cubital Length	432-526	477.6 $\pm$ 1.6	18.5	3.9	433-557	474.5 $\pm$ 1.9	22.2	4.7	428-559	475.1 $\pm$ 1.9	23.4	4.9	419-535	478.5 $\pm$ 2.0	24.2	5.1	417-538	474.1 $\pm$ 1.7	21.2	4.5	422-552	480.4 $\pm$ 1.9	23.6	4.9	392-524	475.3 $\pm$ 2.7	25.4	5.3	5	427.2			
50. Middle Finger Length	100-132	119.6 $\pm$ .5	5.2	4.3	105-137	119.6 $\pm$ .6	6.6	5.5	102-133	120.3 $\pm$ .6	6.1	5.1	103-142	121.3 $\pm$ .5	6.3	5.2	104-135	119.3 $\pm$ .5	6.1	5.2	103-138	118.0 $\pm$ .5	6.2	5.3	89-131	116.6 $\pm$ .4	6.1	4.4	5	101.4			
Cubital Index (50:49)	23-27	25.4 $\pm$ .1	.9	3.5	23-28	25.6 $\pm$ .7	.9	3.5	23-27	25.7 $\pm$ .1	.9	3.3	23-29	25.7 $\pm$ .1	.9	3.7	23-29	25.6 $\pm$ .1	.9	3.3	22-29	25.1 $\pm$ .1	.8	3.3	22-27	24.9 $\pm$ .1	.9	3.5	5	23.8			

TABLE 36, showing the means, standard deviations and coefficients of variability of 25 LIMB measurements and indices of the 7 Bantu tribes studied and of the Bushmen.

Foot Index. — The foot indices have been divided arbitrarily into two groups :- A : X-39, B : 40-X, and the percentage distribution is given in Table 41.

	<u>Foot Index</u>	
	A (X-39)	B (40-X)
Gqunukwebe :	36.7%	63.3%
Xhosa :	35.4%	64.6%
Fingo :	33.3%	66.7%
Zulu :	38.0%	62.0%
Sotho :	53.3%	46.7%
Kwena :	64.7%	35.3%
Kgalagadi :	61.3%	38.7%
<u>Bantu Total:</u>	<u>47.0%</u>	<u>53.0%</u>

Table 41. Analysis of the foot indices, showing the percentage distribution among the Bantu tribes examined, after arranging the dimensions into two groups.

Radio/Humeral Index. — The radio/humeral indices have been divided arbitrarily into two groups :- A : X-81, B : 82-X, and the percentage distribution is given in Table 42.

	<u>Radio/Humeral Index.</u>	
	A (X-81)	B (82-X)
Gqunukwebe :	60.0%	40.0%
Xhosa :	63.1%	36.9%
Fingo :	58.3%	41.7%
Zulu :	43.3%	56.7%
Sotho :	36.7%	63.3%
Kwena :	33.3%	66.7%
Kgalagadi :	50.0%	50.0%
<u>Bantu Total:</u>	<u>48.4%</u>	<u>51.6%</u>

Table 42. Analysis of the radio/humeral indices, showing the percentage distribution among the Bantu tribes examined, after arranging the indices into two groups.

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	Gqun	Fingo	Fingo	Gqun	Kwena	Zulu	Zulu	Zulu	Zulu	Sotho	Kwena	K g a l a g a d i					B u s h m e n							Tribes arranged in accordance with their means		
	Xhosa	Zulu	Xhosa	Fingo	Sotho	Sotho	Xhosa	Gqun	Kwena	Xhosa	Xhosa	Gqun	Xhosa	Fingo	Zulu	Sotho	Kwena	Gqun	Xhosa	Fingo	Zulu	Sotho	Kwena	Kgal	Largest	Smallest
35. Length of Femur (38-36-37)		2.5			2.9		3.8	4.8	3.2	3.1		4.8	3.9	2.9		3.3										(Q X K F S Z Kg)
36. Length of Tibia					6.4				4.1		5.6		2.9	2.8		3.6	2.8									K (Kg Q Z X F S)
37. Height of Foot							2.9			4.4	5.1	5.1	5.1	3.9	2.6											(X Q F Z S K Kg)
38. Leg Length(Symphyseal Height+35 mm.)					4.8			3.1	3.6	2.7		2.9				3.2										(K Q X F Kg Z S)
39. Femoro-tibial Length (35+36)					4.8			3.1	4.1		2.7					3.2										(K Q X F Kg Z S)
Sitting Height/Leg Length Index(30:38)											2.6		2.5	3.9	4.3	3.0	5.3									
40. Foot Length						3.7	2.6					2.6		2.6	4.5	2.6										(Z Q F K X S Kg)
41. Foot Width					4.5	2.6			7.0		5.6	7.5		6.4	6.9	4.4										(Q Z F X S K Kg)
Foot Index (41:40)					3.6	2.7			6.0	3.3	6.6	6.4	6.2	6.6	5.5	3.1										
42. Armspan					4.1	3.1																				(Z K Q X F Kg S)
Stature/Armspan Index (42:29)														2.7	3.6	2.8										
43. Length of Humerus					4.0	2.6	2.9			5.4						3.6										(X Q K Kg F Z) S
44. Length of Radius					3.3				3.3		4.1					3.5										K (Q Z S Kg X F)
45. Hand Length						2.7			2.5			4.1	2.8	4.6	5.2	2.5										(Z F Q X S K Kg)
46. Arm Length (43+44+45)					3.3												10.5	9.7	9.5	10.1	8.4	9.2	9.5			(Q K Z X K F)(S) B
47. Humero-radial Length (43+44)					4.1				2.9							2.5										(K Q Kg X Z F S)
Arm Length/Sitting Height Index(46:30)					2.8						3.1	2.7	2.7	3.6												
Radio/Humeral Index (44:43)						2.7	3.6		3.0	6.3	6.5		4.0			2.7	3.0									
Fore-arm Index (45:44)			3.2	3.9	4.5	2.5			7.3		6.4	4.8	5.6	8.1	6.4	3.9										
Arm Length/Leg Length Index (46:38)					3.3		2.5	2.7	3.6			2.6				3.1										
48. Hand Width				2.5	4.6				6.6		5.8	6.3	3.8	3.6	4.6	2.7										(Q Z X F S) (Kg K)
Hand Index (48:45)				4.2				3.1			4.1					3.4										
49. Cubital Length																										(K Z Q Kg X F S)
50. Middle Finger Length					2.6				4.6			4.7	4.1	5.2	7.0	4.0										(Z F X Q S K Kg)
Cubital Index (50:49)					5.4				5.9		5.2	4.5	6.3	7.1	6.8	6.6										
Total percentage of critical ratios																										
Insignificant	100.0	96.0	96.0	92.0	32.0	64.0	76.0	80.0	40.0	76.0	48.0	48.0	52.0	44.0	56.0	48.0	60.0									
Significant		4.0	4.0	8.0	40.0	36.0	24.0	16.0	36.0	16.0	20.0	20.0	32.0	32.0	12.0	48.0	36.0									
Highly Significant					28.0			4.0	24.0	8.0	32.0	32.0	16.0	24.0	32.0	4.0	4.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	

Abbreviations:  
 Gqunukwebe = Q,  
 Xhosa = X, Fingo = F,  
 Zulu = Z, Sotho = S,  
 Kwena = K,  
 Kgalagadi = Kg,  
 Bushmen = B.

TABLE 37, showing the CRITICAL RATIOS of the differences between the means of 25 LIMB measurements and indices in the 7 Bantu tribes studied and in the Bushmen.

Fore-arm Index. — The fore-arm indices have been divided arbitrarily into two groups :- A : X-73, B : 74-X, and the percentage distribution is given in Table 43.

	<u>A</u> (X-73)	<u>B</u> (74-X)
Gqunukwebe :	44.2%	55.8%
Xhosa :	44.6%	55.4%
Fingo :	32.5%	67.5%
Zulu :	39.3%	60.7%
Sotho :	54.0%	46.0%
Kwena :	68.7%	31.3%
Kgalagadi :	68.7%	31.3%
<u>Bantu Total:</u>	<u>51.1%</u>	<u>48.9%</u>

Table 43. Analysis of the fore-arm indices, showing the percentage distribution among the Bantu tribes examined, after arranging the indices into two groups.

Hand Length. — The hand lengths have been divided arbitrarily into two groups :- A : X-189 mm., B : 190 - X mm., and the percentage distribution is given in Table 44.

	<u>A</u> (X-189 mm.)	<u>B</u> (190-X mm.)
Gqunukwebe :	39.2%	60.8%
Xhosa :	54.6%	45.4%
Fingo :	36.7%	63.3%
Zulu :	36.0%	64.0%
Sotho :	49.3%	50.7%
Kwena :	56.0%	44.0%
Kgalagadi :	62.7%	37.3%
<u>Bantu Total:</u>	<u>48.2%</u>	<u>51.8%</u>

Table 44. Analysis of the hand lengths, showing the percentage distribution among the Bantu tribes examined, after arranging the dimensions into two groups.

Hand Width.— The hand widths have been divided arbitrarily into two groups :- A : X-84 mm., B : 85-X mm., and the percentage distribution is given in Table 45.

	<u>Hand Width</u>	
	A (X-84 mm.)	B (85-X mm.)
Gqunukwebe :	30.0%	70.0%
Xhosa :	42.3%	57.7%
Fingo :	45.8%	54.2%
Zulu :	38.7%	61.3%
Sotho :	48.7%	51.3%
Kwena :	66.7%	33.3%
Kgalagadi :	60.7%	39.3%
<u>Bantu Total:</u>	<u>48.2%</u>	<u>51.8%</u>

Table 45. Analysis of the hand widths, showing the percentage distribution among the Bantu tribes examined, after arranging the dimensions into two groups.

Length of Middle Finger. — The middle finger lengths have been divided arbitrarily into two groups :- A : X-118 mm., B : 119-X mm., and the percentage distribution is given in Table 46.

Length of Middle Finger.

	A (X-118 mm.)	B (119-X mm.)
	Gqunukwebe :	45.0%
Xhosa :	47.7%	52.3%
Fingo :	40.9%	59.1%
Zulu :	42.0%	58.0%
Sotho :	49.3%	50.7%
Kwena :	59.3%	40.7%
Kgalagadi :	67.4%	32.6%
<u>Bantu Total:</u>	<u>50.7%</u>	<u>49.3%</u>

Table 46. Analysis of the middle finger lengths, showing the percentage distribution among the Bantu tribes examined, after arranging the dimensions into two groups.

Critical Ratios.— In Table 47 a summary is shown of the critical ratios of the differences between the means of the vault, facial, nasal and ear dimensions and indices. Table 48 is a summary of the critical ratios of the differences between the means of these same head dimensions and indices, to which have been added the critical ratios in connection with the trunk and limbs. The critical ratios have been expressed as percentages representing insignificant (0 to 2.4), significant (2.5 to 4.4) and highly significant (4.5 to X) differences. The head features are recognized to be a more reliable basis than the body features, when population groups are compared.

Summary of the Critical Ratios of the Vault, Face, Nose and Ear

<u>Tribes contrasted</u>	<u>Total percentage of critical ratios</u>		
	<u>A</u>	<u>B</u>	<u>C</u>
	<u>Insignificant</u> <u>(0-2.4)</u>	<u>Significant</u> <u>(2.5-4.4)</u>	<u>Highly Significant</u> <u>(4.5-X)</u>
Gqunukwebe-Xhosa :	79.1%	18.6%	2.3%
Fingo-Zulu :	60.5%	30.2%	9.3%
Fingo-Xhosa :	72.1%	25.6%	2.3%
Gqunukwebe-Fingo :	72.1%	20.9%	7.0%
Kwena-Sotho :	46.5%	46.5%	7.0%
Zulu-Sotho :	62.8%	23.3%	14.0%
Zulu-Xhosa :	53.4%	32.6%	14.0%
Zulu-Gqunukwebe :	34.9%	34.9%	30.2%
Zulu-Kwena :	41.9%	25.6%	32.6%
Sotho-Xhosa :	58.2%	30.2%	11.6%
Kwena-Xhosa :	53.5%	27.9%	18.6%
<hr/>			
<u>Kgalagadi with</u>			
Gqunukwebe :	46.5%	25.6%	27.9%
Xhosa :	58.2%	11.6%	30.2%
Fingo :	44.2%	23.3%	32.6%
Zulu :	44.2%	27.9%	27.9%
Sotho :	53.5%	37.2%	9.3%
Kwena :	83.7%	16.3%	0.0%
<hr/>			
<u>Bushmen with</u>			
Gqunukwebe :	7.7%	23.1%	69.2%
Xhosa :	11.5%	26.9%	61.5%
Fingo :	11.5%	19.2%	69.2%
Zulu :	11.5%	15.4%	73.1%
Sotho :	11.5%	26.9%	61.5%
Kwena :	15.4%	26.9%	57.7%
Kgalagadi :	23.1%	15.4%	61.5%

Table 47, showing a summary of the critical ratios of the differences between the means of the vault, facial, nasal and ear dimensions and indices of the 7 Bantu tribes studied and of the Bushmen: 28 dimensions and 15 indices (total 43) in the Bantu, and 17 dimensions and 9 indices (total 26) in the Bushmen; the tribes are contrasted in the same groups as in Tables 2, 10, 18 and 24.

Summary of the Critical Ratios of the Vault, Face, Nose, Ear  
Trunk and Limbs

Tribes <u>contrasted</u>	Total percentage of critical ratios		
	A Insignificant (0-2.4)	B Significant (2.5-4.4)	C Highly Significant (4.5-X)
Gqunukwebe-Xhosa :	85.9%	12.8%	1.3%
Fingo-Zulu :	75.6%	19.3%	5.1%
Fingo-Xhosa :	83.3%	15.4%	1.3%
Gqunukwebe-Fingo :	80.8%	15.4%	3.8%
Kwena-Sotho :	41.0%	42.3%	16.7%
Zulu-Sotho :	64.0%	28.3%	7.7%
Zulu-Xhosa :	66.7%	25.6%	7.7%
Zulu-Gqunukwebe :	55.1%	26.9%	18.0%
Zulu-Kwena :	46.2%	25.6%	28.2%
Sotho-Xhosa :	62.8%	26.9%	10.3%
Kwena-Xhosa :	53.8%	23.1%	23.1%
<hr/>			
<u>Kgalagadi with</u>			
Gqunukwebe :	48.7%	21.7%	29.6%
Xhosa :	53.8%	20.4%	25.8%
Fingo :	44.9%	25.6%	29.5%
Zulu :	48.7%	23.0%	28.3%
Sotho :	48.7%	42.3%	9.0%
Kwena :	78.2%	20.5%	1.3%
<hr/>			
<u>Bushmen with</u>			
Gqunukwebe :	9.1%	21.2%	69.7%
Xhosa :	12.1%	24.2%	63.7%
Fingo :	12.1%	18.2%	69.7%
Zulu :	12.1%	15.2%	72.7%
Sotho :	12.1%	24.2%	63.7%
Kwena :	15.2%	24.2%	60.6%
Kgalagadi :	21.2%	15.2%	63.6%

Table 48, showing a summary of the critical ratios of the differences between the means of the vault, facial, nasal, ear, trunk and limb dimensions and indices of the 7 Bantu tribes studied and of the Bushmen: 50 dimensions and 28 indices (total 78) in the Bantu, and 23 dimensions and 10 indices (total 33) in the Bushmen; the tribes are contrasted in the same groups and order as in Tables 2, 10, 18, 24, 30 and 37.

## SECTION 7 - SKIN COLOUR

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The Von Luschan colour scales were used to determine the skin colour of the Bantu tribes studied and of the Bushmen. Of these colour tablets only eight were used (14, 17, 18, 20, 21, 22, 24 and 31). Some of these colours that are close on the scale, were combined, e.g. Nos. 14 and 20 (see Table 49), also Nos. 17 and 21, 22 and 18, thus leaving five different classes altogether. The colour recorded, was taken where the lightest patch showed on the body - face, trunk or limbs.

The type of climate and the clothing worn, are factors that influence skin colour, and a few remarks may be made in this connection :

The Gqunukwebe and the Fingo: the majority wear European clothing; the climate is mild. The Xhosa: the majority go naked altogether in summer, except for a loose blanket sometimes used; at home the men wear only a penis sheath of thin leather and are then looked upon as perfectly dressed; the climate is warm and humid. The Zulu: the majority wear European clothing; the climate is hot and humid near the coast. The Sotho: all well covered with clothing and blankets; the climate is cool. The Kwena and Kgalagadi: the majority of the Kwena wear European clothing all the year round; the Kgalagadi wear home made skin clothes in winter.

The percentage distribution for skin colour has been calculated for the five classes given in Table 49.

Skin Colour in the South African Bantu and  
in the Bushmen

	A 14+20 very light brown	B 17+21 light brown	C 22+18 brown	D 24 reddish brown	E 31 black- brown
Gqunukwebe	: 0.8%	24.2%	68.3%	6.7%	0.0%
Xhosa	: 0.8%	5.3%	57.9%	26.9%	9.1%
Fingo	: 0.0%	5.0%	86.6%	6.7%	1.7%
Zulu	: 1.3%	6.7%	76.0%	10.7%	5.3%
Sotho	: 1.3%	4.0%	76.7%	15.3%	2.7%
Kwena	: 0.7%	4.0%	91.3%	2.7%	1.3%
Kgalagadi	: 0.0%	10.0%	82.0%	11.3%	0.0%
<b>Bantu Total:</b>	<b>0.7%</b>	<b>7.6%</b>	<b>77.4%</b>	<b>11.4%</b>	<b>2.9%</b>
Bushmen	: 8.0%	40.0%	32.0%	20.0%	0.0%

Table 49, showing the percentages of the different skin colour categories according to the Von Luschan colour scales in the 7 Bantu tribes examined and in the Bushmen.

D I S C U S S I O N

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SECTION I - THE VAULT

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Maximum Head Length, Maximum Head Breadth, Cephalic Index, (Tables 1, 2, 3).— The South African Bantu tribes have a fairly uniform maximum head length. Only the Gqunukwebe tribe is slightly above the other groups in this dimension. The maximum head breadth, however, is more variable and seems to reflect more the genetic influence of elements foreign to the Bantu. The Zulu and Fingo tend towards brachycephaly, the Kwena and Kgalagadi towards hyperdolichocephaly. All the Bantu groups are considerably more dolichocephalic than the Bushmen; the mean maximum head breadth for the Bushman group, in spite of this, only equals that of the Kwena and Kgalagadi.

The Fingo and Zulu cephalic index reflects the admixture of a brachycephalic element. The mesaticephalic belt stretching from the Congo to Abyssinia (Keith, 1911; Seligman, 1932) is 2,500 miles to the north of Zululand. The eastern seaboard of Africa, from Egypt to Natal, has for the last 3,000 years been subjected to a sustained infiltration from the Near East and from Asia (Leys and Joyce, 1913; Dart, 1937). The mesaticephalic element in the Zulu and Fingo was acquired from these east coast elements fairly recently, because the historically, linguistically and ethnologically related Xhosa and other Cape Nguni tribes that separated from the Zulu and Fingo before 1500 (Bryant, 1950), do not possess this element. On the other hand the Kwena and Kgalagadi are essentially an inland group, that never came into contact with the brachycephalic elements along the east coast. Their head width in my opinion reflects the result of Bushman influence.

Supra-auricular Head Height and related indices, (Tables 1, 2, 4, 5).— The lowest means for the supra-auricular head height

are seen in the Kgalagadi and in the Sotho, the highest in the Zulu and in the Xhosa. The Zulu are more hypsicephalic and acrocephalic than any other group; the Kgalagadi and Sotho are more chamaecephalic than the other tribes; the Gqunukwebe, Fingo and Sotho are more tapeinocephalic than the other tribes.

A low head height is characteristic of the Bushmen (Keen, 1947), and it is obvious that the Zulu do not possess this feature. The Kgalagadi and Sotho dimensions and indices reflect Bushman admixture. The low-headed element in the Gqunukwebe and Fingo however has a different explanation. The Gqunukwebe are historically known to be of mixed Xhosa and Hottentot origin; the Hottentots have a lower head height than the Bantu (Keen, 1947 and 1951). This therefore explains the tapeinocephaly in the Gqunukwebe. The Fingo, after severing contact with the Zulu, acquired their tapeinocephaly either from the Gqunukwebe or directly from the Hottentots in the Eastern Cape Province.

Cranial Capacity, (Tables 1, 2, 6).— When the Bantu are grouped into oligencephals, euencephals and aristencephals, the Zulu and Gqunukwebe have the largest percentages of aristencephals, the Kgalagadi, Kwena and Sotho the largest percentages of oligencephals. In the case of the Kgalagadi, Kwena and Sotho, Bushman admixture has decreased the size of their heads. Asiatic influence explains the larger Zulu head. A Hottentot element in the Gqunukwebe make-up effected a relatively larger head (Keen, 1947 and 1951).

Minimum Frontal Width, (Tables 1, 2).— The Kgalagadi, Kwena and, to a lesser extent, the Sotho have small minimum frontal widths; the Gqunukwebe, and after them the Fingo, have the largest means for this dimension. In my opinion this can be explained as follows: the Bushmen have a mean minimum frontal width that is much smaller than that of the Bantu, while the Hottentot mean minimum frontal width is larger than that of

the Bantu (Keen, 1947). The smaller mean minimum frontal width in the Kgalagadi, Kwena and Sotho is a manifestation of Bushman genetic influence, the larger minimum frontal width in the Gqunukwebe and Fingo a manifestation of Hottentot admixture.

Bi-mastoid Width, Bi-mastoid/Bi-parietal Index, (Tables 1, 2, 8) and 8).— The Zulu have the smallest bi-mastoid width, with the Fingo coming next; the Kgalagadi, Kwena and Gqunukwebe have the largest bi-mastoid widths. The analysis of the bi-mastoid/bi-parietal index shows that the Zulu and Fingo are strongly represented in the A group with the lower index; the Kgalagadi, Kwena and Gqunukwebe are strongly represented in the C group with the high index. In the Zulu and Fingo the low index reflects a Hamitic strain, the high index in the Kwena and Kgalagadi a Bushman strain, while the high index in the Gqunukwebe reflects a Hottentot strain.

## SECTION 2 - THE FACE

Width of the Eyebrow Ridges, Maximum Bi-zygomatic Width, Eyebrowridge/Bi-zygomatic Index, Prominence of the Eyebrow Ridges, (Tables 9, 10, 11, 12).— The largest width of the eyebrow ridges is seen in the Gqunukwebe, Fingo and Xhosa, the smallest in the Kwena, Kgalagadi and Sotho. Correspondingly in Table 11 we see that the Gqunukwebe have the largest percentage of the higher group of eyebrowridge/bi-zygomatic indices. The maximum bi-zygomatic width is largest in the Fingo, Xhosa and Gqunukwebe, the smallest in the Kwena, Kgalagadi and Sotho. The small dimensions for the width of the eyebrow ridges and for maximum bi-zygomatic width of the Bushmen, appear in the Kwena, Kgalagadi and Sotho. But the Gqunukwebe, Fingo and Xhosa in respect of these dimensions, and in respect of prominence of

the eyebrow ridges (Table 12) reflect the influence of Hottentot admixture. Broom (1941) found that a section of the Hottentots possessed this characteristic, and called them "australoid Korana". Dreyer and Meiring (1937) described a group of "australoid Korana" skulls from Kakamas (N.W. Cape Province). The Gqunukwebe are historically recognized to be of partly Hottentot origin. The Hottentots also transmitted these characteristics directly or through the Gqunukwebe to the Fingo and Xhosa.

Upper Facial Height, Total Facial Height and related indices, (Tables 9, 10, 13, 14).— The Xhosa have the shortest face; they are followed by the Gqunukwebe, the Kgalagadi and the Fingo. The Sotho have the longest face, and are followed by the Zulu and the Kwena. Keen (1947) found that the mean upper facial height of the Hottentot is highly significantly larger than that of the Bushman, but significantly smaller than that of the Bantu.

The smaller facial heights and indices in the Xhosa, the Gqunukwebe, the Kgalagadi and the Fingo may therefore be due to Bushman or Hottentot influence. In the case of the Kgalagadi, the probability of Bushman admixture is greater than that of Hottentot admixture. The Xhosa have the smallest mean upper facial height of the Bantu tribes, and this may be due to Bushman admixture. The larger facial heights and indices in the Sotho, the Zulu and the Kwena are of Negro and Hamitic origin.

Bigonial Width, Auriculo-gnathion Length, Mandibular Index, Gonion-gnathion Length, (Tables 9, 10, 15).— Mandibular data for skeletal material indicate that the Bantu have narrow and long mandibles, and that the Bushmen have wide and short mandibles; the Hottentot mandible is as long as that of the Bantu, but narrower (Keen, 1947). The corresponding dimensions and indices for the living indicate similar tendencies. The Kgalagadi

gadi, Kwena, Sotho and Xhosa tend towards the Bushman type of mandible, the Gqunukwebe and Fingo towards the Hottentot type, while the Zulu have a typically Bantu mandible, reflecting Negro-Hamitic origin.

The ramus of the Hottentot mandible is considerably wider than those of the Bushmen and the Bantu (Keen, 1947). The width of the ramus, which is a front to back dimension, must have an effect upon the length of the mandible base, i.e. the gonion to gnathion length, because the span available for the teeth must be the same. The differences between the mean gonion-gnathion lengths in Table 9 suggest Hottentot influence in the Gqunukwebe. There is a highly significant critical ratio (6.1) between the means for gonion-gnathion length in the Zulu and Gqunukwebe (Table 10); but there is no significant difference between the means for auriculo-gnathion lengths in the same group. The increased gonion-gnathion length in the Gqunukwebe can only be brought about by a backward displacement of the gonion in relation to the other two points, and this may be considered to be a Hottentot characteristic.

Bilabial Height, Width of the Mouth, Bilabial Index, (Tables 9, 10, 16).— The Negro type of mouth comprises thick, everted lips, protruding on account of maxillary and dental prognathism, a wide mouth and a concave upper lip; the bilabial index is high. The Hamitic type of mouth has a low bilabial height, is wide, and therefore has a low bilabial index; the upper lip is concave. The Hottentot type of mouth comprises thick but flat lips and a narrow mouth, and the upper lip is convex. The mouth resembles a pursed pouch closed over the teeth and the bilabial index is high. The Bushman type of mouth has a low bilabial height and is narrow. The upper lip is usually convex and the bilabial index is lower than that of the Hottentot or Bantu.

The low bilabial index of the Fingo is of Hamitic origin. The low Sotho bilabial index is the effect of Hamitic

or of Bushman influence. The high bilabial index in the Zulu is that which is characteristic of the Bantu as a whole. The particularly high bilabial index in the Gqunukwebe may be considered to be due to Hottentot admixture and the resulting diminution of the width of the mouth.

### SECTION 3 - THE NOSE

The shape of the nose and its dimensions vary considerably amongst the peoples of Africa. Three main nasal forms are represented in the South African Bantu : A) The Negro type of nose, which is large and relatively wide, with a fairly low, wide root and bridge; the nasal index is chamaerhine and hyperchamaerhine. B) The Hamitic type of nose with a higher root and bridge, the latter being sometimes slightly arched and decreasing in depth towards the tip, which is often of the drooping type; this type is narrower than the Negro type of nose, the nasal index usually being mesorhine. C) The Bushman-Hottentot type of nose, which is characterized by a low and wide root, a concave bridge and a low and wide base; the nasal index is hyperchamaerhine. These three types of noses are so distinct and easily recognizable, that the nasal shape of each individual examined could be placed into one or other of these three groups from observation alone. The percentage distribution of the three types in the various Bantu tribes is shown in Table 19. Stray representatives of the leptorhine Caucasian (European and Indian), and of the high Armenoid (Arab and Armenian) types were occasionally seen in each tribe, but these were grouped with the Hamitic noses.

Orbito-nasal Arc, External Orbital Width, Orbito-nasal Index,  
(Tables 17, 18, 20).— The means of the orbito-nasal arc and the external orbital width indicate that the Kwena, Kgala-

gadi and Sotho have the small dimensions of the Bushmen. An analysis of the orbito-nasal indices shows a tendency in the Zulu towards a lower orbito-nasal index, which is the Hamitic type, and a tendency in the Gqunukwebe and Kgalagadi towards a higher orbito-nasal index, which is the Bushman-Hottentot type. In the Gqunukwebe we probably have Hottentot, in the Kgalagadi Bushman genetic influence.

Nasal Root Elevation, Internal Orbital Width, Nasal Root Index, (Tables 17, 18, 21).— The highest nasal root elevations are seen in the Zulu, the Sotho and the Fingo, the lowest in the Gqunukwebe, Kgalagadi and Kwena. As regards nasal root index, the Zulu and Sotho most closely approximate the Hamitic groups, while the Gqunukwebe with the low nasal root index demonstrate the Hottentot influence. The Sotho, Kwena and Kgalagadi have smaller internal orbital widths than the other tribes and higher nasal root indices than the Gqunukwebe, who have a wide internal orbital dimension.

Nasal Height, Nasal Width, Nasal Index, (Tables 17, 18, 22).— The Kgalagadi and Xhosa approach the small Bushman dimension in their mean nasal heights. The Kgalagadi, Kwena and Sotho are close to the Bushman in their mean nasal widths. There is a larger percentage of mesorhiny among the Zulu and Sotho than among the other tribes, and this shows their approximation to the Hamitic type. As regards hyperchamaerhiny, the largest percentage appears among the Gqunukwebe, which indicates their Hottentot affinities.

Data for other Negro, Nilotic and Hamitic groups have been obtained from the literature (Leys and Joyce, 1913; Martin, 1928; Seligman, 1932; Dos Santos Junior, 1945) and the ranges for two nasal dimensions and the nasal index appear in Table 50. In their nasal indices the South African Bantu are less hyperchamaerhine than the non-South African Bantu and the

West African Negro.

Ranges of the Nasal Height, Nasal Width and  
Nasal Index in the racial groups of Africa

(dimensions in millimeters)

	A <u>Nasal Height</u>	B <u>Nasal Width</u>	C <u>Nasal Index</u>
Bantu (non-South African):	46.8-48.0	44.0-45.1	87.2-101.5
Nilotes :	46.8-47.3	39.8-43.6	82.6-93.2
W.A.Negroes :			93.8-107.5
Hamites :	34.7-37.3	48.7-49.9	69.6-76.6

Table 50, showing the ranges of the nasal height, nasal width and nasal index in the racial groups of Africa.

SECTION 4 - THE EAR

According to Martin (1928), the Negroes have large auricles with well-developed lobules, but with a considerable proportion of attached lobules. The Hamitic peoples also have large auricles with well developed lobules, but a much smaller proportion of attached lobules, and in contrast with the Negro, the auricles are higher. The Bushmen have small auricles, both as regards height and width. They are "typical, almost square, non-lobulated;.....this type is closely applied to the head and broadly adherent thereto" (Dart, 1937). The top part of the helix is excessively folded, running almost horizontally from its point of commencement. The Hottentot type of ear is "somewhat larger than in the Bushman, and while it does not display the same well-marked peculiarities as the Southern Bushman ear, is on the whole strongly reminiscent of it, especially in the shape and in the well-rolled helix" (Schapera, 1930). The Hottentot type of ear may also be defined as an "equally non-lobulated but pyriform organ, slender below where it runs into the neck, and bellying out in its broad

upper part, standing typically away from the head, in some cases almost at right angles to the sagittal plane of the head." (Dart, 1937).

Ear Height, Ear Width, Ear Index, (Tables 23, 24, 25, 26).—

Martin (1928) states that the "Semites" are macrotic, the "Europeans" and "Egyptians" mesotic, the Negroes microtic and the Bushmen hypermicrotic. The Hottentot mean ear height may be considered as intermediate between the microtic Negro and the hypermicrotic Bushman.

The mean ear heights of the Kwena, Kgalagadi and, to a certain extent, the Sotho, resemble the mean Bushman dimension (Tables 23, 24, 25). The mean ear widths among the Kwena, Kgalagadi and Sotho are also more Bushman-like than those of the other tribes. The Fingo and Zulu mean ear heights and widths are large and therefore Hamitic. The Gqunukwebe and Xhosa in their mean ear heights and widths approximate the Negro and Hottentot. The higher mean ear index of the Gqunukwebe shows that they approximate the Hottentot proportions more than the Xhosa, while a lower ear index among the Xhosa shows their Negro affinity and less Hottentot influence. The grouping of the ear indices reveal tendencies of a similar nature (Table 26).

Height of the Ear Lobule, (Tables 23, 24, 27).— Martin (1928)

found that the attached type of lobule occurs in Europeans, but is much more frequent among the Negroes. The ear type with a small or with no lobulé also appears in these two groups, but the lobeless ear appears to be a racial characteristic of the Bushmen and Hottentots. In Table 27 the Kwena, Kgalagadi and Gqunukwebe show high percentages of lobeless ears, and this demonstrates Hottentot affinity in the case of the Gqunukwebe and Bushman affinity in the case of the Kwena and Kgalagadi. The Zulu and Fingo are Hamitic in their ear

lobule heights and shapes.

Height of Ear Base (also called Height of Ear Attachment),

Ear Base Index, (Tables 23, 24, 28).— The ear base index contrasts the height of the ear base with the total height of the ear. In the Bushmen and Hottentots the index is high, because the auricles project very little above and below the attached part. I consider a high ear base index an approximation of the Bushman and Hottentot type of ear. In Table 28 the ear base indices have been divided into two groups, A and B, and a high percentage under B indicates Bushman or Hottentot influence.

#### SECTION 5 - THE TRUNK

Stature, (Tables 29, 30, 31).— In Table 51 data on the mean statures of many African population groups have been collected from the literature (Tucker and Myers, 1910; Keith, 1911; Tremearne, 1911; Seiner, 1912; Leys and Joyce, 1913; Martin, 1928; Schapera, 1930; Seligman, 1932; Dos Santos Junior, 1945; Keen, 1951). The statures have been divided into low, medium and high stature groups, and the relative position of the 7 Bantu tribes studied and of the Bushmen are seen.

#### Statures of Population Groups from Africa

##### Low Stature (X to 1599 millimeters)

"Congo" Pygmies . . . . .	1411
"Pure" Bushmen . . . . .	1440
"Southern" Bushmen(67). . . . .	1444
"Babinga" West African Negroes. . . . .	1510
"Northern" Bushmen. . . . .	1515
"Batwa" Bushmen . . . . .	1542

"Northern" Bushmen (111) . . . . .	1553
"Northern" Bushmen (66) . . . . .	1570

Medium Stature (1600 to 1699 millimeters)

<u>Bushmen (25) . . . . .</u>	<u>1611</u>
Cape Coloureds (288) . . . . .	1621
"Kharga" Egyptians . . . . .	1638
"Kenya" Indians (39) . . . . .	1641
"Kenya" Bantu(1185) . . . . .	1649
"Comoro" Islanders(23) . . . . .	1654
"Mozambique" Bantu (282) . . . . .	1664
"Bambara" West African Negroes . . . . .	1665
"Blue Nile" Nilotes (50) . . . . .	1665
<u>Fingo (120) . . . . .</u>	<u>1674</u>
<u>Kgalagadi (150) . . . . .</u>	<u>1674</u>
<u>Xhosa (130) . . . . .</u>	<u>1675</u>
<u>Sotho (150) . . . . .</u>	<u>1684</u>
<u>Zulu (150) . . . . .</u>	<u>1677</u>
"Berber" North African Hamites . . . . .	1680
<u>Kwena (150) . . . . .</u>	<u>1684</u>
South West African "Rehoboth Bastards" (Hottentot-European) . . . . .	1684
<u>Gqunukwebe (120) . . . . .</u>	<u>1685</u>
"Blue Nile" Nilotes (658) . . . . .	1688
"Southern" Nilotes (297) . . . . .	1692
"Congo" Bantu (100) . . . . .	1692
West African Negroes . . . . .	1693

High Stature (1700 to X millimeters)

"Azande" Nilotic Bantu . . . . .	1700
"Somali" Hamites (183) . . . . .	1724
"White Nile" Nilotes (183) . . . . .	1743
"Masai" Hamitic Nilotes . . . . .	1747
"Lake Chad" West African Negroes . . . . .	1750
"White Nile" Nilotes (48) . . . . .	1752

Nilotes. . . . . 1765

Table 51, showing the mean male statures of population groups from Africa, arranged in 3 classes - Low (X to 1599 mm.), Medium (1600 to 1699 mm.); and High (1700 to X mm.); the numbers in brackets indicate the number of individuals measured; the 7 Bantu groups examined by me and the one Bushman group have been included and underlined to show their relative positions as regards stature among the African tribes.

As shown in Table 51 the South African Bantu tribes studied can be classed as of a medium-high stature. The groups with higher statures are chiefly exceeded in mean stature by the Nilotes, the Hamites and the West African Negroes.

Sitting Height, Sitting Height/Stature Index, (Tables 29, 30, 32, 33).— The Kgalagadi, Sotho and Kwena show the smallest means for the sitting height, the Gqunukwebe, Fingo, Xhosa and Zulu the highest, and Table 32 clearly shows the relative distribution. Seiner (1912) gave 784 mm. as the mean sitting height for 97 Bushmen. The Kgalagadi, Sotho and Kwena are closer to the Bushman mean sitting height than the other tribes. According to Seiner's data, the mean sitting height/stature index for 97 Bushmen was 50.5. This is practically similar to the mean indices of the Kgalagadi, Kwena and the Sotho. The other 4 tribes have higher indices, i.e. longer sitting heights, which is a Hamitic characteristic.

Bi-acromial Width, Bi-cristal Width (also called Width of the Pelvis), Bi-cristal/Sitting Height Index, (Tables 29, 30, 34).— From Table 30 emerges the fact that the bi-acromial width is a much less variable factor than the bi-cristal width. The latter dimension shows highly significant critical ratios separating the Kwena and Kgalagadi on the one side from the Fingo, Xhosa, Sotho, Zulu and Gqunukwebe on the other side. The Kgalagadi and Kwena have the smaller mean bi-acromial and bi-cristal widths, and thus approximate the Bushmen. The nutritional condition of a tribe as a whole is a decisive factor in connection with these two dimensions. The

Sotho contain a large proportion of stout individuals and thus show large bi-acromial and bi-cristal widths. The high percentages shown by the Kwena and Kgalagadi for Group A (Table 34), is due to their small average bi-cristal widths. This once more shows their affinity with the Bushmen.

#### SECTION 6 - THE LIMBS

Analyses have been made of certain limb dimensions and indices, after dividing the data in each case arbitrarily into two groups. The percentage distributions have been calculated and the results are shown in Tables 39 to 46.

##### Foot Length, Foot Width, Foot Index, (Tables 36, 37, 40, 41).--

Bushmen have small foot dimensions. Small mean foot lengths and widths in the Bantu indicate Bushman affinity. This tendency is seen in the Kgalagadi, Sotho and Kwena. In connection with foot width, highly significant differences indicate the difference in foot width between the Kgalagadi and Kwena on the one side and the Xhosa, Fingo, Zulu and Gqunukwebe on the other. In Table 41 a large percentage under Group A signifies Bushman affinity. The Kgalagadi, Kwena and Sotho in their foot features thus approximate the Bushmen more than the other tribes.

##### Length of Radius, Radio/Humeral Index, (Tables 36, 37, 42).--

A long radius in comparison with the length of the humerus, is a characteristically Negro feature (Martin, 1928). The Bushmen also have relatively long radii (Drennan, 1937). The Hamites and the Hottentots on the other hand have longer humeri and shorter radii. A high percentage under Group A (Table 42) indicates an approximation to the Hamites and Hottentots, while a high percentage under Group B signifies Bushman or Negro affinity.

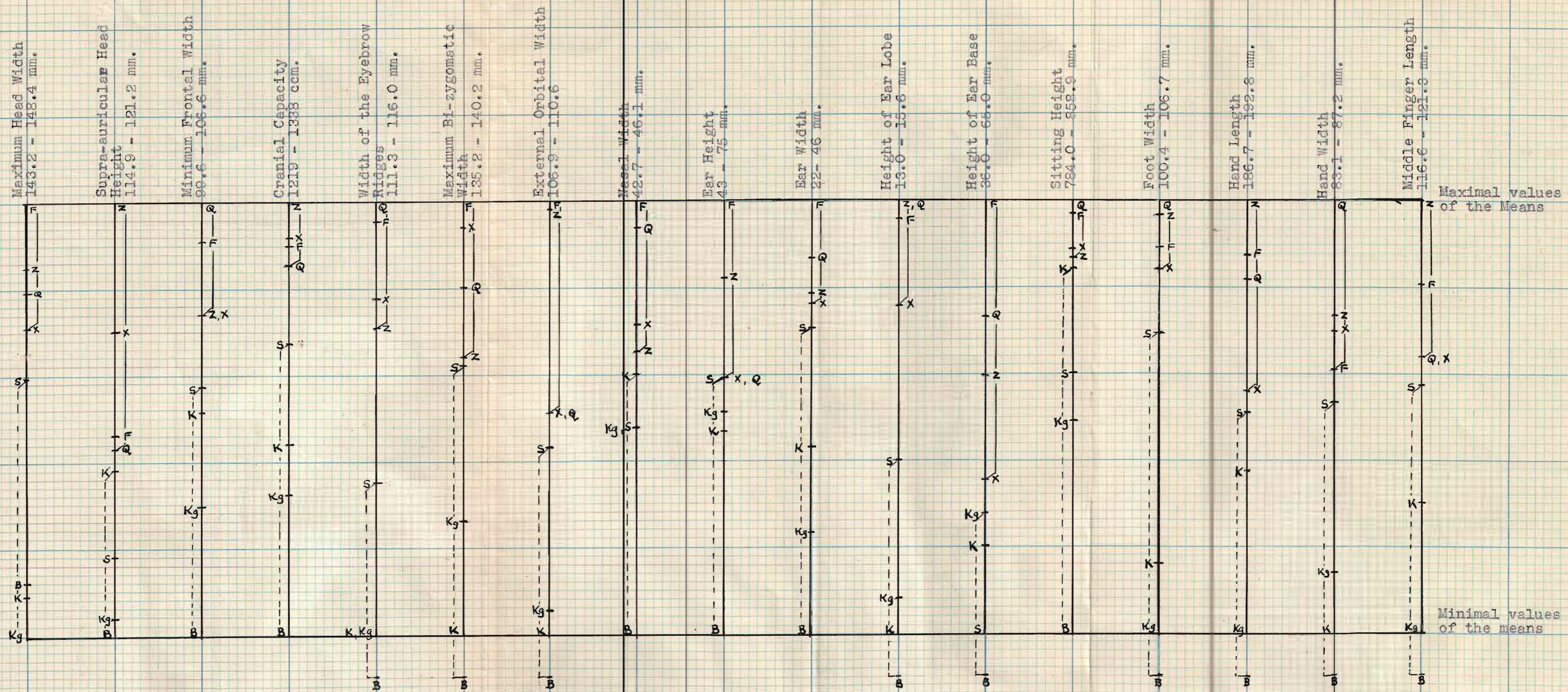


FIGURE 1, showing the means of 17 dimensions arranged in relation to their maximal and minimal values. The interrupted lines indicate that the Sotho, Kwena, Kgalagadi and Bushmen in each case link up with one another in these 17 dimensions; the continuous lines indicate that on the other hand the Zulu, Fingo, Gqunukwebe and Xhosa in each case link up with one another in these 17 dimensions. Where the Bushmen in 9 dimensions have been left out of the comparison on account of insufficient data, a B has been insert-

ed, to show that the mean for 5 male Bushmen in each case was less than the lowest Bantu mean; in the case of the sitting height the mean sitting height of 97 Bushmen (Seiner, 1912) was taken as the Bushman mean. It will be noted that the Sotho in 13 cases out of the 17 are closest to the Nguni group, and that the Xhosa in 10 cases out of the 17 are closest to the Sotho-Tswana-Bushman group. (Abbreviations : Gqunukwebe - Q, Xhosa - X, Fingo - F, Zulu - Z, Sotho - S, Kwena - K, Kgalagadi - Kg, Bushmen - B).

Fore-arm Index, (Tables 36, 37, 43).— The fore-arm index contrasts the length of the hand with the length of the radius (Martin, 1928). The Negro, on account of a relatively long radius, has a low fore-arm index. The Bushman, on account of a relatively short hand, also has a low fore-arm index. On the other hand the Hamite and Hottentot, on account of relatively shorter radii, have higher fore-arm indices. The critical ratios in connection with the fore-arm index (Table 37) indicate that the tribes vary considerably.

A high percentage under Group A (Table 43) signifies Bushman or Negro affinity, while a high percentage under Group B signifies Hamitic or Hottentot affinity.

Hand Length, Hand Width, Length of the Middle Finger, (Tables 36, 37, 44, 45, 46).— The Bushmen have small hand dimensions. Smaller mean hand lengths and breadths in the Bantu indicate affinity to the Bushmen (Tables 36, 37). This is seen in the case of the Kwena, Kgalagadi and Sotho. Tables 44 and 45 show analyses of the hand dimensions. In both tables the Kwena and Kgalagadi show large percentages under group A. The length of the middle finger shows the same tendencies as the hand length in the Kwena and Kgalagadi.

#### SECTION 7 - SKIN COLOUR

As regards skin colour, the majority (77.4%) of the South African Bantu studied can be classed as brown (Nos. 22+18 on the Von Luschan colour scales). The Bushmen and the Hottentots are lighter in colour.

The Gqunukwebe are lighter in skin colour than the other tribes. The largest percentage of darker skins is seen in the Xhosa. The tribes studied are on the whole considerably lighter in skin colour than the Mozambique Bantu, who are mainly of the black-brown (No. 31) and reddish brown (No. 24)

categories. The lighter skin colour of the South African Bantu may be attributed to the Bushman and the Hottentot admixture.

## GENERAL DISCUSSION

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In Table 47 and 48 summaries are shown of the critical ratios of the differences between the means of the vault, facial, nasal, ear, trunk and limb dimensions and indices. The main points emerging from the comparisons in these two tables are:-

The Gqunukwebe correspond most with the Xhosa and differ most from the Zulu and the Kgalagadi; the Xhosa correspond most with the Gqunukwebe and the Fingo and differ most from the Kgalagadi and the Kwena; the Fingo correspond most with the Xhosa and differ most from the Kgalagadi; the Zulu correspond most with the Fingo and differ most from the Kwena, the Kgalagadi and the Gqunukwebe; the Sotho differ equally from all the tribes; the Kwena correspond most with the Kgalagadi and differ most from the Zulu; the Kgalagadi correspond most with the Kwena and differ most from the Zulu and Gqunukwebe. When the tribes are placed in relation to one another, the extremes are then the Zulu, the Gqunukwebe, the Kwena-Kgalagadi and the Sotho. The Fingo and Xhosa are somewhere between the Zulu and Gqunukwebe on the one hand, while the Xhosa on the other show greater affinity with the Kwena and the Kgalagadi than either the Fingo, the Gqunukwebe or the Zulu.

The Bushmen show greater affinity with the Kgalagadi, Kwena, Sotho and Xhosa, than with the Zulu, Fingo or Gqunukwebe.

The Gqunukwebe are a tribe of mixed Xhosa and Hottentot origin. A comparison of their features with those of the other tribes showed that they possess more Hottentot characteristics than any other South African Bantu tribe. On the other hand the critical ratios showed their affinity to the Xhosa.

The Xhosa are the largest Transkei tribe. They speak a language closely related to the Zulu language. It contains three clicks. The Xhosa in some Hamitic features show affinity to the Zulu. Their contact with Hottentots in the Eastern Cape Province is apparent from a few characteristic Hottentot features. The Xhosa also exhibit some Bushman features. When migrating from Central to South Africa, the Xhosa formed the Nguni vanguard and came into contact with large groups of Bushmen.

The Fingo came from Natal during the first quarter of the nineteenth century, and for a time stayed amongst the Xhosa. In some respects the Fingo still resemble the Zulu, but show more Xhosa than Zulu affinity. In the Eastern Cape Province the Fingo also acquired a few Hottentot features, either directly from the Hottentots, or through the Gqunukwebe or the Xhosa.

The Zulu tribe was formed from related Natal and Zululand Nguni clans between 1815 and 1835. The Zulu are the most Hamitic of the South African Bantu tribes. Some "Asiatic" east coast elements have also been absorbed by them, e.g., mesaticcephaly. No Bushman or Hottentot features are seen in the Zulu, although their language contains three clicks.

The Sotho tribe was formed more than a century ago by Moshesh from related Sotho clans. Nguni elements have also been taken up into the Sotho tribe, but a large section of these Nguni, while being looked upon by the tribe as Sotho, are still pure Nguni. The Sotho clans formed the Sotho-Tswana vanguard in their migration to South Africa. Their language contains one click. A few Hamitic features

are seen in the Sotho, but a large number of features show the affinity of the Sotho to the Bushmen.

The Kwena are a major Tswana tribe, living in the Bechuanaland Protectorate. They have for a long time been in close contact with the Kgalagadi, a dependant Tswana tribe, that preceded them into Bechuanaland. The Kwena have also been in contact with the Bushmen of the Kalahari Desert. The large number of Bushman features seen in the Kwena, show the effect of their long contact with the Bushmen. More Bushman features are seen in the Kwena than in the Sotho.

The Kgalagadi, living mainly in the Kalahari Desert, correspond with the Kwena in many of their Bantu features. The effects of a sustained and close contact with the Bushmen are seen in a large number of features. The Kgalagadi are more Bushmanoid than the Kwena.

In Figures 1 and 2 a reflection is seen of the general tendency when these South African Bantu tribes are compared.

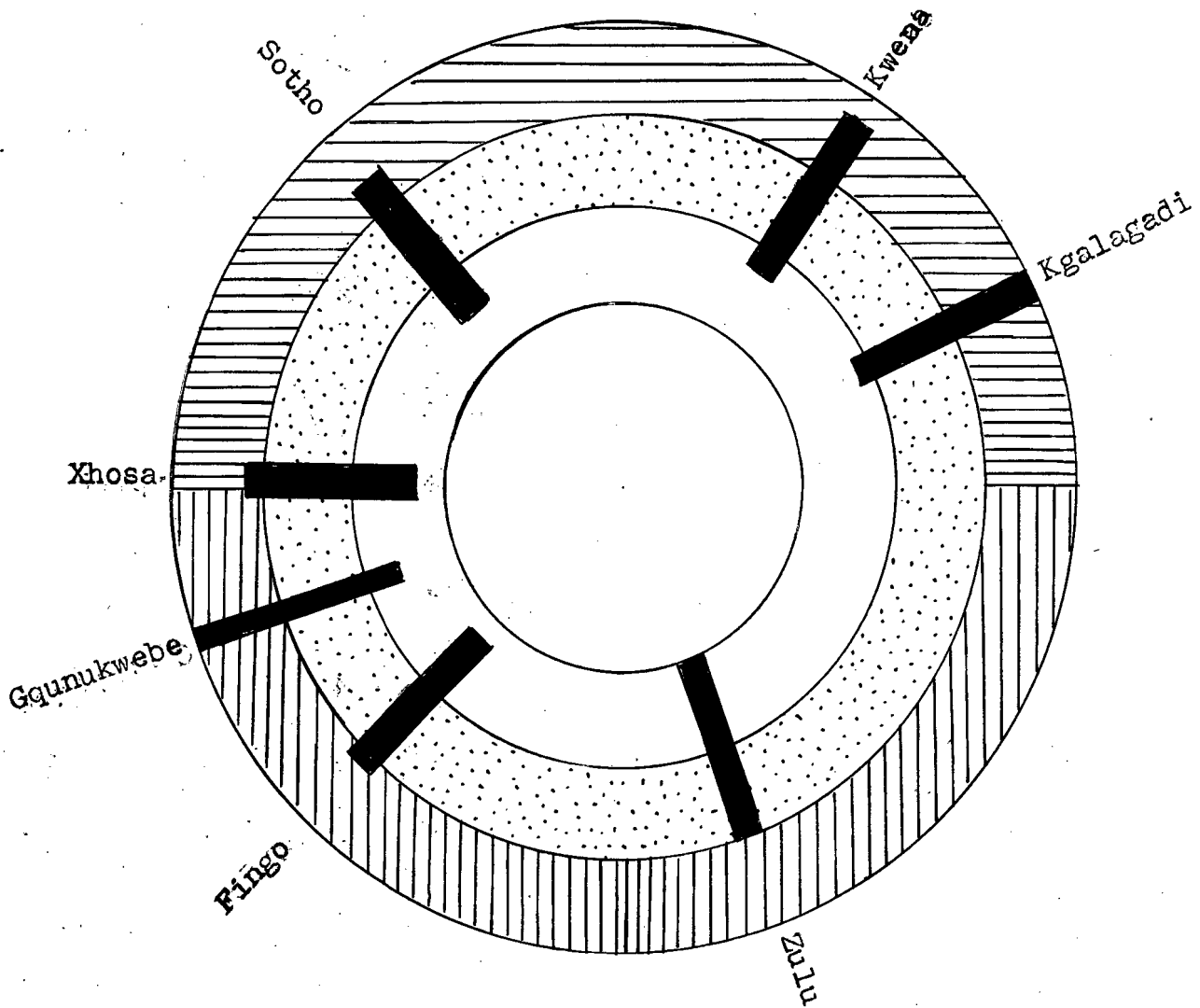


FIGURE 2, showing (a) the position of the seven South African Bantu tribes in respect of their affinity to one another, (b) the extent to which they exhibit Hamitic, Bushman or Hottentot features. Of the outer band the upper half (transversely shaded area) represents Bushman characteristics and the lower half (vertically shaded area) represents Hottentot affinity. The middle band (stippled area) represents the Negro affinity, and the inner band (left white) represents Hamitic genetic influence. The black strip for the Zulu stretches across the entire width of the Hamitic band, and this demonstrates that they show the maximum amount of Hamitic influence among the South African Bantu tribes. Similar observations apply to the Gqunukwebe and Kgalagadi in respect of Hottentot and Bushman influence respectively.

## CONCLUSIONS

The high-medium statures of the 7 Bantu tribes studied are exceeded mainly by those of the Nilotes and the West African Negroes. The lighter skin colour of these tribes in comparison with the Bantu as a whole, may be attributed to Bushman-Hottentot admixture.

GQUNUKWEBE.— The Gqunukwebe are a tribe of mixed Xhosa and Hottentot origin. The following characteristics show their Hottentot affinity :-

- (1) Mean maximum head width, slightly wider than the head widths of the other tribes.
- (2) High percentage of tapeinocephaly, resulting from the smaller head height of the Hottentot.
- (3) High percentage of aristencephals, as the Hottentot has a relatively large head.
- (4) Large mean minimum frontal width.
- (5) Large mean bi-mastoid width.
- (6) Large mean width of the eyebrow ridges - an australoid feature acquired from australoid Hottentots; also a large percentage of individuals with prominent eyebrow ridges, likewise acquired from the australoid Hottentots.
- (7) Large mean maximum bi-zygomatic width.
- (8) Small mean upper and total facial heights.
- (9) Large mean gonion-gnathion length.
- (10) Large mean bilabial index.
- (11) Large percentage of individuals with the Bushman-Hottentot nasal type.
- (12) Large mean for the orbito-nasal index.
- (13) Small mean nasal root elevation and index.
- (14) Large percentage of hyperchamaerhine noses.
- (15) Similar means for the ear heights and ear widths; large

mean for the ear index.

- (16) High percentage of lobeless ears.
- (17) Large mean for the ear base index.
- (18) Light skin colour.

XHOSA.— The Xhosa are an Nguni tribe, and numerically the largest tribe in the Transkei. In some features the Xhosa show affinity to the Natal Nguni, i.e. the Zulu, in some features to the Hottentots, and in some to the Bushmen. The following characteristics show the affinity of the Xhosa to the Zulu :-

- (1) Large mean supra-auricular head height.
- (2) Large percentage of Hamitic noses, common to both.
- (3) Large mean in the sitting height/stature index, again a Hamitic feature common to both.

The following characteristics show the affinity of the Xhosa to the Hottentots :-

- (1) Large mean width of the eyebrow ridges.
- (2) Large percentage of individuals with prominent eyebrow ridges.
- (3) Large mean bi-zygomatic width.

The following features in the Xhosa show their Bushman affinity :-

- (1) Short, wide mandible.
- (2) Small mean nasal height.
- (3) Short upper face.

FINGO.— The Fingo came from Natal during the first quarter of the nineteenth century and for a time stayed amongst the Xhosa. They now show more Xhosa than Zulu affinity. In the Eastern Cape Province they also acquired some Hottentot features, either directly from the Hottentots, or through the Xhosa and Gqunukwebe. In the following respects the Fingo resemble the Zulu :-

- (1) Their heads tend towards brachycephaly.

- (2) Small mean bi-mastoid width, a Hamitic feature common to both groups.
- (3) Large percentage of Hamitic noses, again common to both groups.
- (4) Large mean nasal root elevation.
- (5) Large mean ear heights and widths.
- (6) The Hamitic type of ear lobules.
- (7) Large mean for the sitting height/stature index, - again a Hamitic characteristic common to both.
- (8) Large mean for the fore-arm index, - likewise a Hamitic feature.

The Fingo acquired the following characteristics from the Hottentots after they had settled in the Eastern Cape Province:-

- (1) Tapeinocephaly.
- (2) Large mean minimum frontal width.
- (3) Large mean of the eyebrow ridges and a large percentage of individuals with prominent eyebrow ridges.
- (4) Large mean maximum bi-zygomatic width.
- (5) Short upper face.

ZULU.— The Zulu tend towards brachycephaly more than any other South African Bantu tribe. This is an "Asiatic" feature. Further they show a high proportion of hypsicephaly and acrocephaly - more than the other South African Bantu tribes. The Zulu show their affinity with the Hamites in the following features:-

- (1) Small mean bi-mastoid width.
- (2) Long face.
- (3) Large percentage of Hamitic noses.
- (4) Small mean for the orbito-nasal index.
- (5) Large mean nasal root elevation and large mean for the nasal root index.
- (6) Large percentage of mesorhine noses.
- (7) Large mean ear heights and widths.
- (8) Large and well developed ear lobules.

- (6) Short and wide mandible.
- (7) Large proportion of noses of the Bushman-Hottentot type.
- (8) Small mean nasal height and width.
- (9) Small mean ear height and width.
- (10) High percentage of lobeless ears.
- (11) Large mean for the ear base index.
- (12) Small mean for the sitting height/stature index.
- (13) Small mean bi-acromial width.
- (14) Small mean bi-cristal width and a small mean for the bi-cristal/sitting height index.
- (15) Small mean foot dimensions and a small mean for the foot index.
- (16) Small mean hand dimensions.

KGALAGADI.— The Kgalagadi exhibit the following Bushman features :-

- (1) Small mean supra-auricular head height, with a corresponding high percentage of chamaecephals.
- (2) Large percentage of oligencephals.
- (3) Small mean minimum frontal width.
- (4) Large mean bi-mastoid width.
- (5) Small mean width of the eyebrow ridges.
- (6) Small mean maximum bi-zygomatic width.
- (7) Short upper face.
- (8) Short, wide mandible.
- (9) Large percentage of noses of the Bushman-Hottentot type.
- (10) Small mean nasal dimensions.
- (11) Large mean for the orbito-nasal index.
- (12) High percentage of lobeless ears.
- (13) Large mean for the ear base index.
- (14) Small mean sitting height.
- (15) Small mean for the sitting height/stature index.
- (16) Small mean bi-acromial width.

- (17) Small mean bi-cristal width.
- (18) Small mean for the bi-cristal/sitting height index.
- (19) Small mean foot dimensions and a small mean for the foot index.
- (20) Small mean hand dimensions.

S U M M A R Y

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A STATISTICAL COMPARISON OF THE PHYSICAL FEATURES OF  
THE ZULU-XHOSA AND SOUTH SOTHO-TSWANA PEOPLES OF  
SOUTH AFRICA

by

Frederick Wilhelm Strydom

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This thesis contains the results of an anthropometrical study of 970 South African Bantu males. The measurements were taken in the course of a lengthy journey by motor and trailer through the Ciskei and the Transkei in the Eastern Cape Province, Natal and Zululand, Basutoland and the Bechuanaland Protectorate.

The following is a list of the tribes studied :-

Gqunukwebe Xhosa	: 120)				
Gaika Xhosa	: 130)	250)	)		
Fingo	: 120)	270)	)		520 Nguni males
Zulu	: 150)		)		
South Sotho	: 150)		)		
Kwena Tswana	: 150)		)		450 Sotho males
Kgalagadi Tswana	: 150)		)		

TOTAL : 970 males between the ages of 21 and 75

Some living Bushmen were measured, and Bushman cranial data extracted from the literature, are compared with those of the Bantu.

Altogether 45 direct measurements were made of each individual. Five dimensions and 28 indices were calculated from these and added to the data. Photographs were also taken of suitable representatives of each group.

The thesis contains a historical introduction.

In the body of the thesis there are fifty tables, dealing respectively with the features of the cranium (vault), face, and especially of the nose and ear. There are also sections on the trunk, limbs and skin colour.

The data for each character have been analysed

statistically to show the range, mean, standard deviation and coefficient of variability . The critical ratios of the differences between the means of the different dimensions and indices are shown.

The author has come to the following general conclusions as regards the relationship of these tribes to one another:-

The Gqunukwebe, a tribe of mixed Xhosa and Hottentot origin, exhibited more Hottentot features than any of the other tribes. The Xhosa tribe showed affinity to the Fingo, the Gqunukwebe and the Zulu, but also exhibited some Bushman and Hottentot features. The Hottentot features were acquired by the Xhosa in the Eastern Cape Province. The Fingo, who migrated from Natal between 1815 and 1830 and then for a time lived amongst the Xhosa in the Eastern Cape Province, show affinity to the Xhosa, the Zulu and the Gqunukwebe. They acquired some Hottentot features in the Eastern Cape Province. They also retained some of the Zulu features acquired from the "Asiatic" east coast elements of Africa. The Zulu exhibit no Bushman or Hottentot features. They are the most Hamitic South African tribe, but some "Asiatic" African east coast elements have been absorbed by them, e. g. a tendency to brachycephaly. The Sotho are composed of Hamitic, Negro and Bushman elements. A large number of features show the Bushman affinity in the Sotho. The Kwena and Kgalagadi live in the Bechuanaland Protectorate, the Kgalagadi in the Kalahari Desert, where they have for a long time been in close contact with the Bushmen. In both the Kwena and Kgalagadi the effects of a sustained Bushman admixture are seen, in the Kgalagadi more than in the Kwena.

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