

Professor Osborn (of American fame) wrote a treatise on the development of elephants from prehistoric times, and the author (I am speaking from memory) depicts the earlier forms as animals somewhat resembling the present-day tapir (*Tapirus terrestris*). Evolution proceeded and the animal changed structurally in many ways, but during the continuance of many radical changes the same long-shaped, ovoid type of skull retained its essential characteristics, and the cervical vertebræ were antero-posteriorly much longer than is now the case in modern elephants. These two characteristics are very marked in the water-elephants, and M. Le Petit is most emphatic that the heads reminded him more of enormous tapirs than of any other existing animal.

REPORT ON A SKULL FROM BRITISH EAST AFRICA¹

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I. INTRODUCTORY

The skull and scapula to be described in the following paragraphs were submitted to me for examination by the Council of the East Africa and Uganda Natural History Society. I desire to tender my cordial thanks to the Society for their kindness, and in particular I must express my gratitude to H.M. Senior Provincial Commissioner, C. W. Hobley, Esq., C.M.G., who has interested himself in the matter not only by making the arrangements necessary for the transmission of the specimens, but also in providing detailed information relating to the circumstances of their discovery.²

Mr. Hobley has thus ascertained that the skull and scapula were found by an Italian missionary at an altitude of 8000 feet

¹ Reprinted from *Journal of Anatomy and Physiology*, vol. xlvi. by kind permission of Dr. Duckworth.

² Mr. J. W. T. McClellan kindly presented the specimen to the Society's Museum.

in Nyeri District, west of Kenya, and on the edge of the forest on the Aberdare Range. The Italian missionary who made the discovery relates that the bones were six feet below the surface, and that charcoal was found with them.

The peculiar features of the circumstances are that although the remains are almost certainly those of a Kikuyu native, yet the representatives of that tribe do not now usually occupy such elevated localities, and in fact are not known to live at an elevation higher than 7000 feet, i.e. 1000 feet lower than the site of the interment. The evidence in favour of assigning the bones to a Kikuyu skeleton is very strong, and is drawn from the characters of the lower jaw. From that bone the lower incisor teeth had been removed long before death. Artificial removal of these teeth is very characteristic of Kikuyu natives. But they do not usually inter their dead. As, however, an exception to this statement is to be made in respect of eminent persons and aged females, the skull in question (since it comes within the latter category) is still probably of Kikuyu origin.

Having regard to all these points, the inference is drawn that the bones have been interred for many years, and must be regarded as ancient in more senses than one. But the bones are stained by vegetable juices, and from what is known of the locality I consider that the antiquity of the remains is not extraordinarily great. The conditions would probably not admit of the preservation of such remains for any very protracted period. The fragile condition of the bones shows that no appreciable degree of mineralisation has been attained. These remarks are necessary in order to show that, although this may be described as an ancient Kikuyu skull, that designation is not intended to suggest a high degree of antiquity in a geological sense.

From such general considerations I now pass to the characters of the several bones.

II. DESCRIPTIVE

The specimens comprise (a) a cranium with the mandible, (b) a fragment of a left scapula.

A

The cranium is fairly complete, although the zygomatic arches have been broken. On the right side the malar bone is absent. In texture the bone is brittle, but not excessively so.

The form of the skull is very distinct. It is long, narrow, and low, thus representing the so-called 'cylindroid' type.

The individual was an aged female. The sex is indicated by the small size of the specimen, the lack of prominent ridges or processes, and the general smoothness of the surface. In particular, the inion cannot be defined with accuracy.

Advanced age is indicated by the loss of several teeth, and by the wide-spread synostosis of the bones forming the cranial vault. The positions of the bregma and lambda are therefore uncertain.

No evidence of artificial deformation is provided. There are no marks of wounds, nor of ulcerative disease. The bones are all stained with vegetable juices, as indeed is to be expected in the circumstances (cf. introductory notes).

The more important features will now be enumerated in detail.

The long ellipsoidal form of the cranium is most distinct in the *norma verticalis* (fig. 1). It follows that the parietal eminences are not specially distinguishable. The alveolar border of the maxilla is visible in this aspect, but the zygomatic arches were probably just concealed. The synostosis of the coronal and sagittal sutures is practically complete.

In *norma lateralis* (fig. 2), the deficiency in vertical height is a marked character. The brow ridges are not distinct, nor is there any special prominence at the glabella. The frontal bone rises steeply from the nasion, and the sagittal arc runs into a plateau at the vertex. From this, the descent commences near the obelion, and the squama occipitis bulges strongly. The *conceptacula cerebelli* are also full and rounded. No prominence corresponding to the inion could be detected.

The temporal ridges are visible, but not marked. The squamosal bone provides a flattened outline above. The

mastoids are feminine or infantile in their smallness, and expose part of the digastric groove. At the pterion, the parietal and alisphenoid seem to have articulated.

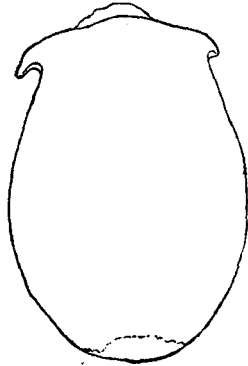


FIG. 1.—Ancient Kikuyu skull in norma verticalis. ($\times \frac{1}{4}$.)

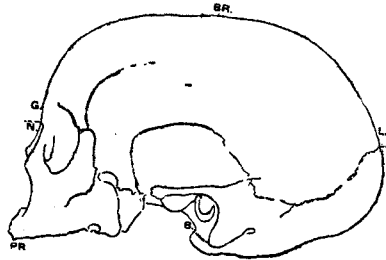


FIG. 2.—Ancient Kikuyu skull in norma lateralis. ($\times \frac{1}{4}$.)

The facial view (fig. 3) shows an evenly-rounded transverse arc. The orbits are rectangular: their axes are nearly horizontal. The outer orbital margin is bevelled.

The nasal bones are small and flat, but still they are slightly inclined towards each other, so that a slight median ridge

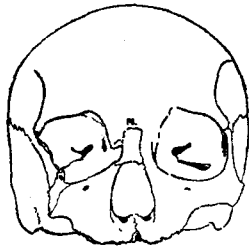


FIG. 3.—Ancient Kikuyu skull in norma facialis. ($\times \frac{1}{4}$.)

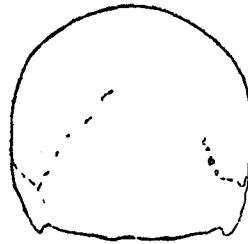


FIG. 4.—Ancient Kikuyu skull in norma occipitalis. ($\times \frac{1}{4}$.)

marks the line of contact (this is in contrast with the so-called typical nasal bones in the African negro races). The pyriform aperture is not tapered above. Its lower margins are absent, leaving the simian grooves.

Subnasal prognathism is present, but in a slight degree only. The canine fossæ are distinct below each orbit.

The palate is of relatively large size: no upper teeth remain (but some have fallen out post-mortem). The cranial base is flat. The foramen magnum occupies a central position in *norma basilaris*. This is due to the occipital elongation already remarked. The occipital condyles are small and round. The glenoid fossæ are of the shallow type.

In *norma occipitalis* (fig. 4) the transverse arc is less evenly rounded than in *norma facialis* (*q.v.*). The transverse (coronal) section of the cranium in the parietal region thus contrasts with a similar section in the frontal region. Yet this contrast is not great here. The deficient downward extension of the mastoid processes is evident from this point of view.

B

The mandible is small, with a rather remarkably pointed chin (fig. 5). The whole of the left ascending ramus is deficient and also part of the right side (figs. 5, 6). The lack of lower

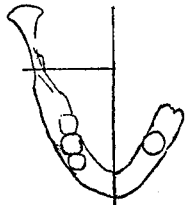


FIG. 5.—The mandible of the ancient Kikuyu skull, viewed from above. ($\times \frac{1}{4}$.)



FIG. 6.—The mandible of the ancient Kikuyu skull, viewed from the right side. ($\times \frac{1}{4}$.)

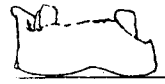


FIG. 7.—The mandible of the ancient Kikuyu skull, viewed from in front. ($\times \frac{1}{4}$.)

incisor teeth is not to be ascribed to senility; for, as already noted, these teeth are artificially extracted by the Kikuyu tribe. The remaining teeth are: on the right side pm_2 , m_1 , m_2 , on the left m_1 only. Taking the general dimensions of the skull into comparison, these teeth are relatively large, but not excessively so. Yet they are distinctly larger than in the majority of civilised jaws.

The pointed chin has been already noted. In this region of the bone, an irregularity just to the right of the middle line suggests a former but long-repaired fracture. The incisura submentalis (cf. fig. 7) is distinct. Posteriorly, well-marked digastric fossæ are observed, and above these two small spinous processes, one on each side of the mid-line. The mylo-hyoid ridge is not prominent. The sigmoid notch (fig. 6) is very shallow, even when allowance is made for the defect in the coronoid process. The angle is a large one in degrees. The condylar surface is transversely elongated, but is distinctly small in antero-posterior extent.

The left side bears evidence of an alveolar abscess in the socket of the third molar tooth, and the loss of this tooth receives its explanation hereby.

C

The fragment of scapula evidently belonged to the same individual as the skull and jaw. But beyond noting its small size, no further remarks are to be made on this fragment.

The more important cranial measurements are given in the first of the accompanying tables (Table I). The cephalic index (68) bears witness to the elongated form of the cranial part of the skull, as does the value (62.3) of the altitudinal index to its deficiency in vertical extent. The alveolar index is of the mesognathous order. This implies that the prognathism is mainly alveolar and subnasal.

With three exceptions, the remaining indices and angles provide no material for special comment. The exceptions are (1) the calvarial-height index, (2) the bregmatic angle, and (3) the lambda angle (fig. 8). The calvarial-height index expresses the degree of flattening observed in the sagittal arc of the cranium. A comparison with other data, and especially with those given by Mr. Shore and myself in a recent number of *Man* (September 1911; full references to the sources of information accompany the paper), shows that, as might be expected, this Kikuyu skull finds its associates among the lower types of cranium. In this lowly position, it is not, however, entirely isolated from even European crania. It is

nevertheless very definitely lower than the average European example, and below the range of variation met with in crania of the Dschagga (? Bantu) tribe of South-West Africa.

Remarks of an almost identical kind apply to the results of a study of the bregma and lambda angles. It may be noted that the bregmatic angle of the Kikuyu skull measures 50° . This places the specimen in a lowlier position than the Gibraltar skull (50.5°) and the Spy skull No. 2 (also 50.5°). The evidence of the lambda angle is less striking. For the various values of these angles, reference to the paper mentioned above (*Man*, September 1911) should be made. The cranial

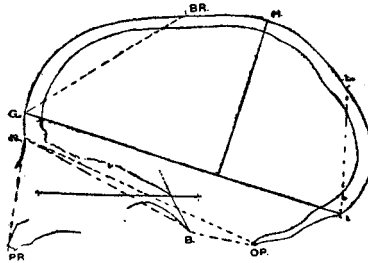


FIG. 8.—Contours of the exocranial and endocranial surfaces of the ancient Kikuyu skull, to show the various angles measured in the median sagittal plane. The contours were drawn with the writer's new form of craniograph. ($\times \frac{1}{2}$.)

capacity calculated by means of Lee's formula gives a value of 1275 c.c.

The chief features of the mandible have been mentioned in an earlier paragraph. In spite of the absence of the coronoid process, the appearances point to a form in which the coronoid does not surpass the condylar process in height. Taking into consideration as many points as can be examined, the whole jaw is peculiarly like that often found in the Bush natives of South Africa. Interest in the characters of the mandible has been greatly stimulated of late by the observations of such observers as Klaatsch, Frizzi, and Elliot Smith (to mention the most recent authors only). But in regard to these characters, Rolleston pointed out many years ago that in Africa a very marked contrast distinguishes the mandible of the Bush native (South Africa) from the corresponding bone

in the Bantu tribes. Yet this Kikuyu mandible, in spite of its Bantu origin, is of the Bush type, not of the Bantu type.

An exception to these remarks is presented by the chin. This is often curiously infantile and lacking in prominence in Bush mandibles. Yet again, the chins in two mandibles of Strand loupers (Bush natives of Cape Colony) at Cambridge are remarkably pointed. The absence of incisor teeth (already noted in the Kikuyu jaw) does not entirely account for the pointed and prominent chins actually observed in these cases.

III. SUMMARY

1. A review of the facts stated in the preceding paragraphs shows that the characteristic features of the Kikuyu skull are the small size and capacity, together with the cylindroid form. Of these characters, none is absolutely distinctive of crania of even lowly races. A comparison of this specimen with one described in the *Journal of Anatomy and Physiology* (vol. xlv. pp. 232 *et seq.*), as well as with others mentioned therein, will fully substantiate this statement. For really distinguishing characters, a closer examination is therefore necessitated. In my opinion, the following features will prove of most use in discriminating between this Kikuyu skull and those of Europeans presenting a superficial resemblance to it (more especially in respect of the 'cylindroid' proportions).

A. The markedly ellipsoidal contour (in norma verticalis), with the post-orbital compression, still recognisable even though of moderate degree.

B. The nasal bones and nasal aperture. Herein the shape and size of the bones, together with the lower margins of the aperture, are indicated specially.

C. The inter-orbital width, which is greater in the Kikuyu skull.

D. The indistinctness of the outer orbital margins.

E. The slight but distinct alveolar prognathism.

F. The large palate and macrodont dentition.

2. Having thus compared this Kikuyu skull with specimens

of European origin, it remains to compare or contrast it with others of a lowlier type.

(a) As regards the Kikuyu tribe, the only available material is the female cranium (Mus. Anat. Cant., No. 5418), presented to the University Collection by Mr. Hobley. In details, some marked points of contrast appear. But before mentioning these, it is important to note that changes associated with senility might prove amply sufficient to transform the young female skull (5418) into a fair likeness of the 'ancient' Kikuyu skull.

The points of difference remarked above are as follows: the younger Kikuyu skull (5418) is less elongated (cephalic index 73·5), less flat (altitudinal index 71·8), though more prognathous (alveolar index 102·6), while the nasal aperture is distinctly wider (nasal index 58·9).

(b) The A-Kamba or Wa-Kamba natives are a Bantu tribe, neighbours of the Kikuyu. Few crania of the Wa-Kamba are to be found in European collections. The Cambridge Museum contains, however, three specimens, presented by Mr. Hobley. These crania were described by me in *Man* (1909, No. 69). Although small, and presenting points of resemblance with South African Bush crania, the Wa-Kamba skulls are less dolichocephalic and less platycephalic than the ancient Kikuyu skull. But among five Wa-Kamba skulls in the Aberdeen Museum (described by Dr. James Adams in the *Proc. Aberdeen Anth. and Anat. Society*, 1902) one (No. II of that series) certainly presents a definite similarity to the ancient Kikuyu skull. The Wa-Kamba skull No. II is less dolichocephalic, but it is distinctly flattened, and in its maxillary and nasal characters it appears like the Kikuyu skull. Dr. Adams also remarks that No. II is the skull of an aged man, and that it resembles crania of Bush natives of South Africa. No detailed comparison is possible, owing to the abbreviated account provided by the memoir to which reference has been made.

(c) The Bush natives of South Africa have been mentioned in several places in the preceding paragraphs. The ancient Kikuyu skull resembles Bush skulls in respect of the lower jaw, and to some extent in the frontal region and face. But

its extreme elongation and narrowness provide points of distinct contrast.

(*d*) In these very characters the Kikuyu skull resembles the skull of a young female native of Somaliland. The specimen was presented to the Cambridge Museum by Mr. Drake-Brockman, but no details as to the locality or tribe are given.

(*e*) The small capacity and size as well as the marked elongation of the Kikuyu skull distinguish it from those commonly found in the Southern Bantu tribes. Its great length also prevents a just comparison with skulls of Central African pygmies.

(*f*) Great elongation, narrowness, and small capacity are distinctive of the Australian aboriginal cranium. Yet the Kikuyu skull lacks completely the carinate or scaphoid character of the transverse cranial arc, so marked in many Australian crania. The steeply-rising brow and the flat (not up-curved) nasal bones provide a further means of distinction.

(*g*) The resemblance of the ancient Kikuyu skull to the Somaliland skull has been mentioned (*cf.* para. *d.*) I should not be surprised to find similar specimens in the Sudan, nor in South-West Africa.

Beyond such general indications, I am not in a position to suggest any means of referring this specimen to one rather than another of the more clearly-distinguishable negro or negroid types met with in the African continent.

REPORT ON A KIKUYU SKULL

TABLE OF MEASUREMENTS, ETC.

Maximum length . . .	183	Parietal chord (vertical) . . .	89
Maximum breadth . . .	124.5	Maximum frontal width . . .	108
Basal height . . .	114		
Auricular height . . .	104	Basi-nasal length . . .	100
Horizontal circumference . . .	503	Basi-alveolar length . . .	98 (?)
Transverse arc (supra-auricular) . . .	270	Facial height (N-Pr.) . . .	65 (?)
Frontal arc . . .	120 (?)	Nasal height . . .	49
Parietal arc . . .	104 (?)	" width . . .	25.5
Occipital arc . . .	128 (?)	Orbital height . . .	36
Frontal chord . . .	105 (?)	" width . . .	42
Parietal " . . .	92 (?)	Palatal length . . .	54
Occipital " . . .	95 (?)	" width . . .	58
Parietal height (arc) . . .	104	Mandible: width at angle . . .	82
		Gonion to Symphysision . . .	74

AFRICA IN VERTEBRATE PALAEOLOGY 109

	Transverse.	Antero-posterior diameter.
Teeth. [Right side] \overline{M}_2	10·5	11
	\overline{M}_1	11·5
[Left side] \overline{M}_1	11	12
Cranial Capacity (Lee's formula, employing auricular height), 1275 c.c.		

Indices and Angles.	Indices and Angles.
Breadth index 68	Dental \overline{M}_1 (L.) 91·6
Altitudinal index 62·3	Frontal bone index 97·2
Alveolar " 98 (?)	Gonio-symphysial (mandible) 110·8
Orbital " 85·8	Bregma angle 50°
Nasal " 52	Lambda " 75°
Palatine 107·4	Facial (Frankfort) 84°
Calvarial height. 49·1	Basilar (Broca) No. 1 17°
Dental \overline{M}_1 (R.) 95·6	" " No. 2 13·5°
" \overline{M}_2 (R.) 95·4	Foramino-sellar 127°

ON THE IMPORTANCE OF AFRICA IN VERTEBRATE PALAEOLOGY

BY C. W. ANDREWS, D.Sc. F.R.S. (British Museum, Natural History).

In the history of the world perhaps no phenomenon is more striking than the rapid growth of our knowledge of the African continent during the last half-century. Within the last few years this advance has been especially marked in the case of Geology and Palaeontology, much light having been thrown on the former physical conditions and inhabitants of this region. It is a remarkable circumstance that although Africa has long been admitted to be one of the oldest land-areas in the world, portions of it not having been submerged since the Permian period or even earlier, nevertheless there has been, until quite recently, a strong and unreasonable tendency among Palaeontologists to deny that this continent had been the centre of origin of any important groups of animals. So recently as 1900 Professor H. F. Osborn referred to Africa as 'the dark continent of Palaeontology, for it has practically no Mammal history.' Although, at the time, this was true in the case of the Mammalia, it was by no means so in the case of the Reptilia, of which a great number of extraordinarily interesting forms had long been known from the Permian and