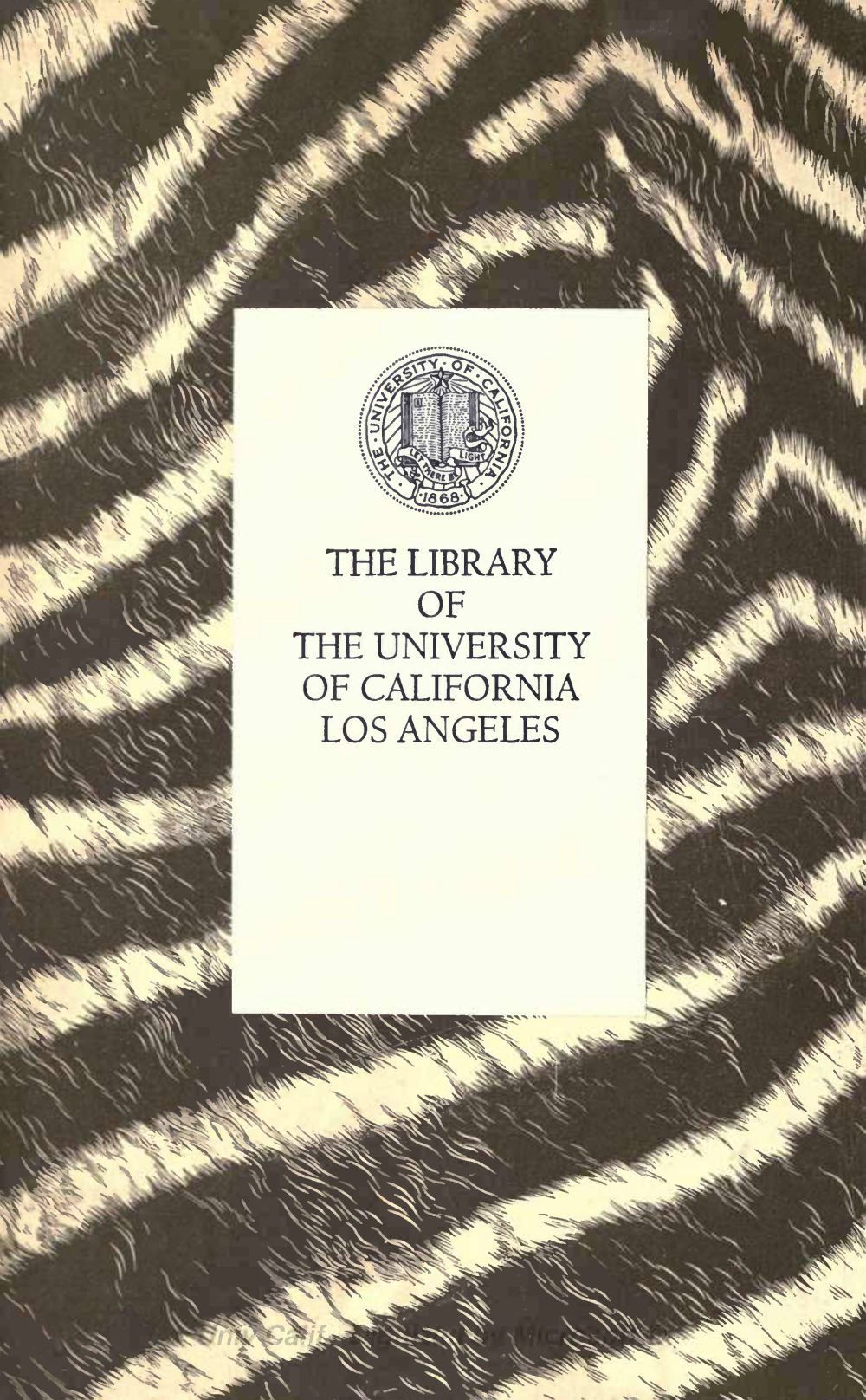
THE GAME ANIMALS OF AFRICA

R. LYDEKKER



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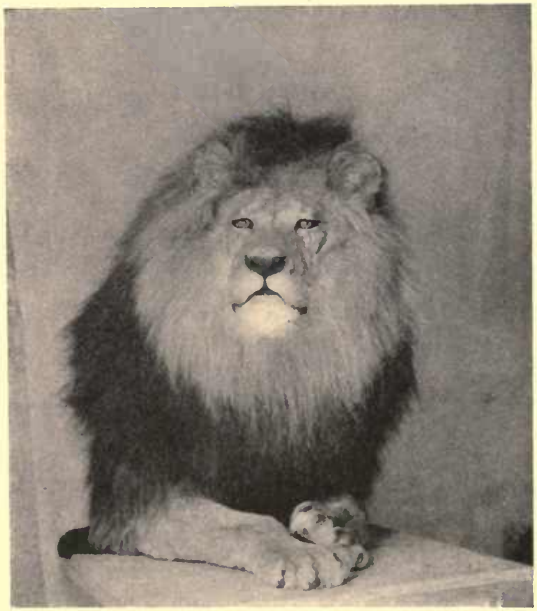
BY

R. LYDEKKER



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1908

TO THE

DUKE OF BEDFORD, K.G.

WHO HAS DONE MUCH TO INCREASE OUR KNOWLEDGE

OF THE BIG GAME OF THE WORLD

THIS VOLUME

BY HIS GRACE'S PERMISSION

IS DEDICATED

BY THE AUTHOR

PREFACE AND INTRODUCTION

In the present volume I have attempted to do for the big and other game of Africa what has been accomplished in *The Game Animals of India, Burma, etc.*, for those of the chief Asiatic dependencies of the British Empire. The task has, however, been one of far greater magnitude, not only on account of the much larger number of species and races to be dealt with, but from the imperfect state of our knowledge of no inconsiderable proportion of these, and the uncertainty still existing as to the limitations of species, in contradistinction to local varieties or races. In the main, species have been regarded in as wide a sense as possible; but in the case of many groups, such as the duikerboks, the time is not yet ripe for anything approaching a final classification, and there can be little doubt that several nominal species will in the future have to take a lower grade.

The plates have been reduced, with some amendments, from those in the quarto volume issued under the title of *The Great and Small Game of Africa*. I have also made use of such portions of my own contributions to that work as were suitable to the present; while I have likewise availed myself of the invaluable accounts of the distribution and habits of the various species given in the same volume by African sportsmen. These latter have, however, been condensed to a greater or less degree, and likewise slightly modified in other ways, in order to bring them up to date and to the requirements of this volume. In other respects the work is entirely new, although the accounts of some of the recently described species and races have been reproduced, with

more or less alteration, from the Zoological Society's *Proceedings*, the *Field*, and other journals.

The work in its present state can only be regarded as a preliminary attempt to give something like a complete account of the game-fauna of the African continent; and it is certain that many alterations—and, it is hoped, many additions—will have to be made in future editions.

Two points in connection with the African continent demand brief mention: firstly, its enormous area, about four times that of India; and, secondly, the marked distinction of the fauna of Africa north of the Sahara, or north of the tropic of Cancer, from that of all the vast region to the southward of the same. Northern Africa is, in fact, so far as its animals are concerned, a part of Europe. We have, for instance, in this area such groups as deer, sheep, goats, and bears, which are conspicuous by their absence from the rest of the continent, except so far as sheep and goats have penetrated some distance into the highlands of the north-eastern corner. On the other hand, what may be called the characteristic African animals are to a great extent wanting from the tract north of the Sahara.

Africa south of the tropic of Cancer is conveniently called Ethiopian Africa, or simply Ethiopia. The local differences in the Ethiopian fauna are chiefly dependent upon what naturalists call "station." One of the most marked of these local faunas is that of the great equatorial forest-zone. The Cape fauna likewise presented many peculiarities in the days of its prime; while the fauna of East Africa shows a certain approximation to that of India.

Except that a few occur in Syria and Arabia, the antelopes and most of the other herbivorous big game animals of Ethiopian Africa belong to types unknown elsewhere. Exclusive of the gazelles, the antelopes, for instance, are generically distinct from those of other lands; while giraffes, okapi, hippopotamuses, wart-hogs, bush-pigs, forest-hogs, and ant-bears are unknown elsewhere at the present day. Moreover, although the elephant, rhinoceroses, and zebras and quaggas

have near relatives in other parts of the world, the Ethiopian species belong to subgroups unrepresented elsewhere.

So far as can be ascertained, most of these animals, inclusive of the elephant, appear, however, to have been immigrants into Ethiopia from south-western Asia, where remains of many of the generic types are met with in a fossil condition.

R. LYDEKKER.

HARPENDEN LODGE, HERTS,
July 1, 1908.

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ADDENDA

A BOOK of the present nature must of necessity be to some extent out of date even before it is published. In the present instance I have been enabled to make the following additions as the text was passing through the press.

Kilimanjaro Bonte-Quagga.

In June of the present year Sir E. G. Loder sent me the photograph of a bonte-quagga shot in British East Africa which presents some approximation to the markings characteristic of the specimen in the Museum at Edinburgh to which the name of "Ward's zebra" has been given (see p. 65 of text). I was at the same time informed that this kind of zebra is exceedingly common in British East Africa. From the presence of a distinct "gridiron-pattern" and the alleged relatively large size of the ears, Professor Ewart seems to have regarded "Ward's zebra" as more nearly related to the true or mountain zebra than to the bonte-quagga. In Sir E. G. Loder's specimen, as shown in the figure on next page, the gridiron-pattern is much narrower than in the Edinburgh animal, and the transverse bars are detached from the median dorsal stripe. I find, moreover, that in the mounted specimen of the Kilimanjaro bonte-quagga (*Equus burchelli boehmi*) in the British Museum there occur what may be regarded as vestiges of the gridiron-pattern, thus indicating that Sir E. G. Loder's animal is not separable from that race, whatever may be the case with regard to "Ward's zebra," which apparently came from the same district. The presence of a gridiron-pattern both in the Kilimanjaro bonte-quagga and in "Ward's zebra" suggests that *Equus zebra* and *E. burchelli* are derivates from an ancestor that possessed this characteristic feature.

The Kilimanjaro Steinbok.

On page 40 of the mammalian section of the recently published *Sjöstedts Kilimandjaro-Meru Expedition* (Upsala, 1908) Dr. E. Lönnberg has separated the Kilimanjaro steinbok from the Nyasa *Rhaphiceros campestris neumanni* (see p. 181 of text) on account of the presence on the nose of a long triangular brown patch, as in the typical Cape *R. campestris*. If the absence of

this patch in the Nyasa race be constant, the Kilimanjaro steinbok (which Dr. Lönnberg regards as a subspecies of *neumanni*) may be known as *R. campestris stigmatus*.

The Kilimanjaro Thomson's Gazelle.

The representative of Thomson's gazelle inhabiting the Kilimanjaro district has been found to lack the dark nose-spot characteristic of the typical British East African animal. The name *Gazella thomsoni nasalis* has accordingly been proposed by Dr. Lönnberg (*op. cit.* p. 46) for the former race.

A male and female bushbuck from the Lake Mweru district

Kilimanjaro Bonte-Quagga shot by Sir E. G. Loder in British East Africa, showing gridiron-pattern on the loins.

The Mweru Bushbuck.

described by Dr. Lönnberg on page 48 of the work already cited differ from *Tragelaphus sylvaticus masaicus* by the absence of white stripes on the body and of a white spot on the front of the eye, although the two whitish spots on the cheek are retained. The general colour is dark reddish brown on the back and hind-quarters, passing into smoky brown on the shoulders and sides of the chest; the under-parts being smoky brownish grey with a white patch on the inner sides of the upper part of the legs. For this bushbuck Dr. Lönnberg suggests the name *T. s. meruensis*.

The head and neck of a male of *Giraffa camelopardalis tippelskirchi* from British East Africa presented to the British Museum by Captain Houblon in 1908, and bearing the number 8.7.5.1, presents features which aid in distinguishing that race. In the first place the median

horn is in the form of a low boss, not much taller than in *G. c. wardi*, but extended downwards in the form of a number of minor elevations. On the forehead, especially the median horn, the hair is dark iron-grey, quite unlike that of any other giraffe, and spotting of the rest of the front of the face is also greyish. This grey area is separated from the chestnut-spotted region by a broad white band passing through the line of the eye. Another peculiarity is the presence of faint spotting on the hair covering the main horns. The spots at the back of the head are likewise unusually small. In a presumably older bull shot by Sir E. G. Loder the grey areas on the head are nearly black. In other giraffes they are rufous, brown, or fawn.

The Kilimanjaro Giraffe.

For the wart-hogs of Natal and the Kilimanjaro district Dr. Lönnberg (*op. cit.* p. 55) has proposed the respective names of *Phacochœrus æthiopicus sundevalli* and *P. æ. masaicus*. In both, one pair of upper and either two or three pairs of lower incisor teeth are retained; and by this and their longer skulls (which also show certain structural differences) they are distinguished from the typical *P. æthiopicus*. The Kilimanjaro wart-hog differs from its Natal cousin by the much greater width of the frontal region of the skull.

Eastern Wart-Hogs.

On the evidence of two female specimens, the one with yellowish or rufous brown, and the other with greyish hair, Dr. Lönnberg (*op. cit.* p. 22) considers himself justified in regarding the Kilimanjaro lion as a distinct race, for which the name *Felis leo sabakiensis* is proposed. The grounds for this distinction are certain differences in the proportions of the skull and the relations of their constituent bones.

The Kilimanjaro Lion.

ADDENDUM

The species has been inadvertently omitted from the text.

FOA'S ZEBRA

(*Equus foai*)

To the zebra inhabiting the mountainous country opposite Teti, on the north bank of the lower part of the Zambesi, Messrs. Prazák and Trouessart in 1899 (*Bulletin Muséum d'Histoire Naturelle, Paris*, vol. v. p. 350) gave the name *Equus foai*. From all races of the bonte-quagga this zebra is distinguished by the larger number of main stripes on the body and hind-quarters, and by the circumstance that there is no backward bending (except in the last of the series) of the body-stripes as they approach the dorsal stripe, to which they run approximately at right angles. In this respect Foa's zebra approximates to the true zebra and Grévy's zebra, from both of which it differs by the stripes on the hind-quarters adjacent to the dorsal stripe running parallel with it in the direction of the tail, as in the bonte-quagga, instead of at right angles. Consequently, the "gridiron" pattern of *zebra*, and the concentric stripe-arrangement of *grevyi* in this region are alike wanting. In the general build, as well as in the shape of the head and ears, Foa's zebra is nearer to the bonte-quagga than to either of the other two species. This is borne out by the fact that the body-stripes meet the stripe traversing the middle line of the under surface. The legs are striped to the fetlocks, and the pasterns are black.

SUPPLEMENT TO THE GAME ANIMALS OF AFRICA

In the following pages I have endeavoured to bring the volume as nearly as possible up to date. Most of the matter in the "Addenda" issued with the volume has been incorporated, and the loose sheet relating to Foa's zebra has likewise been included.

R. Lydekker.

Harpenden, *November* 1911.

THE AFRICAN ELEPHANT

(Page 1)

It is stated by Mr. F. A. Knowles in the *Journal* of the East Africa and Uganda Natural History Society for 1911, vol. ii. No. 3, p. 21, that an elephant, locally known as the forest-elephant, and distinguished by its very long and slender tusks, is an occasional visitor to Uganda from the Semliki and the district west of the Albert Nyanza. This elephant is evidently *Elephas africanus albertensis* (*supra*, p. 8), described by myself on the evidence of a tuskless skull, and may now be known as the Semliki race. A pair of tusks from the Semliki received by Mr. Rowland Ward in 1911 were of the slender type described by Mr. Knowles.

The Unyoro elephant, which has been provisionally associated by myself with the Semliki race, is stated by Mr. Knowles to be perfectly distinct, and therefore seems to require a new name.

THE BLACK RHINOCEROS

(Page 25)

In a paper published in the *Proceedings* of the Zoological Society of London for 1909 (p. 198) Dr. E. L. Trouessart suggested that the type of horn described as *Rhinoceros holmwoodi* is referable to the northern race of the white rhinoceros (*R. simus cottoni*). In the *Field* for 1909 (vol. civ. p. 193) I have, however, given reasons in support of the opinion that the long and slender East African horns of the *holmwoodi* type are referable to a local form of the black rhinoceros; and since the publication of that notice I have obtained additional evidence in favour of the same view. The typical specimen was purchased at Zanzibar, but in a pair from British East Africa, presented by Dr. Ansorge to the British Museum, the front horn has the same general character, thereby indicating that this district is the habitat of *R. bicornis holmwoodi*.

In Count Joseph Potocki's *Sport in Somaliland* (1900, p. 82) the name *somaliensis* was applied to the Somali rhinoceros, and although no diagnosis was given, the fact that the name is accompanied by a plate of the animal entitles it to recognition. That the Somali rhinoceros should rank as a local race (*R. bicornis somaliensis*) has been demonstrated by myself in the *Proceedings* of the Zoological Society for 1911, p. 958, where it is shown that the skull, in comparison with an East African specimen, is distinguished—in addition to its inferior size—by its relatively narrow form.

THE BONTE-QUAGGA

(Page 50)

Specimens collected in 1910 by Messrs. Selous and McMillan show that the bonte-quagga, or zebra, inhabiting the Guasengishu plateau of East Africa is more or less completely maneless, lacking even the fore-lock. This gives a very remarkable appearance, the ears standing out from the head like horns instead of being connected by means of the mane and fore-lock. These Guasengishu bonte-quaggas cannot, however, be regarded as even racially distinct from *Equus burchelli granti*, since some examples from the Athi plains—the typical locality of that race—have the mane much less developed than in other representatives of the species.

In 1911, Mr. R. B. Woosnam, Game Warden of the East African Protectorate, sent home a photograph of the skin of a Grant's bonte-quagga in which a saddle-shaped patch on the hind part of the back is devoid of stripes. This unstriped area is situated just where the longitudinal stripes of the hind-quarters pass into the transverse stripes of the back, and occupies about half the interval between that point and the withers. The dorsal stripes are continued through it, and below it the belly-stripes have the normal development. In colour the pale unstriped area is dirty white. The animal, which is adult, was killed near Nakuru, and a few days later a second, but half-grown individual with a similar uniformly coloured area, was shot in the same place. Mr. Woosnam states that the natives are well acquainted with such abnormally coloured zebras, of which for many years there have been one or two among the herds, but never more. In *Nature*, vol. lxxxvi. p. 241, 1901, Professor Ridgeway proposed the name *E. burchelli goldfinchi* for these zebras which are, however, nothing more than abnormalities.

On page 97 of vol. xxiii. of the *Memoirs* of the Linnean Society of Normandy, 1910, Messrs. Brasil and Pennetier described a bonte-quagga as *E. burchelli pococki*. The specimen on which this determination is based is a stallion in the natural history museum at Rouen, obtained in 1882 from the menagerie of one Pézon. Nothing is known of its previous history, although from the type of marking it may be considered certain that it came from southern Africa. In the almost complete absence of barring on the limbs it agrees with the typical *E. burchelli*, but the shoulders and quarters are completely striped, and the body-stripes are continued downwards to join the longitudinal ventral stripe. In the latter respect the race resembles the Zulu *E. b. wahlbergi*, in which the legs are barred to some distance below the knees and hocks. The ground-colour of the coat is cream instead of white, as in the typical *burchelli*. Its describers consider that *E. b. pococki* is extinct, and to a considerable extent intermediate between *E. b. typicus* on the one hand and *E. b. chapmani* and *E. b. wahlbergi* on the other.

In the *Field* for 1909, vol. cxiv. p. 889, Mr. Pocock has given reasons for considering the so-called Ward's zebra (*supra*, p. 65) as a hybrid, born in Messrs. Barnum and Bailie's Menagerie, between the typical zebra and Chapman's bonte-quagga. This so-called species, to which Professor Ridgway inadvertently gave the technical name of *E. wardi* in the *Proceedings* of the Zoological Society for 1909, p. 798, must accordingly disappear.

The South Abyssinian bonte-quagga has been separated by Mr. Camerano (*Atti Ac. Reale Torino*, 1902, p. 10) from the Masai *Equus burchelli granti* as *E. b. jallæ*.

The zebra from North-east Rhodesia described as *E. annectans* (*supra*, p. 65) is regarded by Mr. R. I. Pocock ("Harmsworth Natural History," p. 789) as a bonte-quagga nearly allied to *E. b. crawshayi*, and specially characterised by the great width of the black stripes.

FOA'S ZEBRA

(*Equus foai*)

To the zebra inhabiting the mountainous country opposite Teti, on the north bank of the lower part of the Zambesi, Messrs. Prazák and Trouessart in 1899 (*Bulletin Muséum d'Histoire Naturelle*, Paris, vol. v. p. 350) gave the name *Equus foai*. From all races of the bonte-quagga this zebra is distinguished by the larger number of main stripes on the body and hind-quarters, and by the circumstance that there is no backward bending (except in the last of the series) of the body-stripes as they approach the dorsal stripe, to which they run approximately at right angles. In this respect Foa's zebra approximates to the true zebra and Grévy's zebra, from both of which it differs by the stripes on the hind-quarters adjacent to the dorsal stripe running parallel with the latter in the direction of the tail, as in the bonte-quagga, instead of at right angles. Consequently, the "gridiron" pattern of *zebra* and the concentric stripe-arrangement of *grevyi* in this region are alike wanting. In general build, as well as in the shape of the head and ears, Foa's zebra is nearer to the bonte-quagga than to either of the other species; this being borne out by the fact that the body-stripes meet the stripe traversing the middle line of the under surface. The legs are striped to the fetlocks, and the pasterns black. This species is probably related to Crawshay's bonte-quagga.

THE AFRICAN BUFFALO

(Page 67)

In the *Proceedings* of the Zoological Society for 1910, p. 993, I described a small buffalo from the left bank of the Kwilu river, in

Belgian Congo, as *Bos caffer simpsoni*. In their heavily fringed ears and the general form of the horns these buffaloes approximate to the small red *B. c. nanus*, but the horns are larger, the right one of a bull measuring 25⅜ inches along the outer curve and the left one 24½ inches; the basal girth of the former being 16½ inches, its maximum width 6⅜ inches, and the expanse from tip to tip 13½ inches. In a cow the left horn measured 15 inches in length, with a girth of 9½, and an expanse of 8¾ inches. In profile the horns incline upwards nearly in the plane of the face. The colour of cows and bulls is pure brown, much darker than the tawny red of *nanus*—the young only agreeing approximately in hue with the latter, and the cows being fully as dark as bulls. Usually the fringes of the ears are tinged with tawny, with one white lock.

In the same paper a pair of horns brought home by Dr. K. W. Kumm from the upper Shari valley, in the Lake Chad district, is provisionally referred to *B. c. thierryi*, a race typically from Togoland, German West Africa.

The Shari horns are deeper in the antero-posterior direction at their bases, where they are more expanded and flattened, and also more closely approximated in the middle line than in the type of *thierryi*; but since the latter is a female there seems no reason why they should not pertain to the same race.

The above paper also contains a note on two heads of red buffaloes from French Congo, which appear inseparable from *B. c. cottoni* of the Semliki.

Another, but at present unnamed race of dwarf buffalo inhabits the Yala district of southern Nigeria, and is characterised by the bulls being brownish black and the cows dun or khaki-coloured. Bulls stand from 3½ to 4 ft. at the withers, and are short-legged and heavily built animals. In the adults of both sexes the legs are light-coloured from the knees and hocks to the hoofs. Calves are dark grey.

Specimens of the Senegambian *B. c. planiceros* brought from the Gambia by Mr. Russell Roberts in 1910 show that this race is considerably larger than *B. c. nanus*, with the horns more laterally expanded and recurved, and the general colour brown.

It may be added that in the *Proceedings* of the Biological Society of Washington for 1911, vol. xxiv. p. 191, Mr. N. Hollister expresses the opinion that as the African buffalo is so distinct from the Indian species it ought not to be included in *Bubalus*; if this view be accepted, the name *Syncerus* is available as a subgeneric title.

THE LELWEL HARTEBEEST

(Page 107)

The statement that the typical race of this species, which was described by Heuglin on the evidence of a horn probably bought from Sudani traders, has a dark face-blaze is incorrect. A male and female believed to be from the Lado district were uniformly reddish tawny, with the tips of the horns inclining inwards.

THE KORRIGUM, TIANG, OR TOPI

(Page 116)

A topi from the Guasengishu plateau of British East Africa, lying to the eastward of Mount Elgon, is distinguished from *Damaliscus corrigum jimela* by the blaze on the face being whitish buff, or white instead of black. Although described by Prof. A. Cabrera on page 998 of the *Proceedings* of the Zoological Society for 1910 as a species, it may be regarded as a local race under the name of *D. c. phalius.* In old bulls the blaze is stated to be as white as in a blesbok.

THE BRINDLED GNU OR BLUE WILDEBEEST

(Page 134)

The typical form of the white-bearded race from Kilimanjaro is tawny-coloured, with the fore-quarters marked by transverse chocolate-coloured bands, and the greater portion of the front of the face as well as the sides of the lower part, together with the ears, nearly black. On the other hand, a dark phase is exemplified by a skin from the south of Lake Naivasha, British East Africa, presented to the British Museum by Mr. H. H. Tarn in 1907, by others from the Guaso Nyero valley given by Mr. R. J. Cuninghame in 1908, and by others from East Africa presented by the Master of Belhaven; in these the general colour of the coat of the neck, fore-quarters, and flanks is more or less uniformly blackish brown, passing into dark tawny on a larger or smaller area on the upper surface of the hind-quarters, this light area, which is traversed anteriorly by a dark stripe, extending in one

specimen as far as the mane, but in other examples being mainly confined to the rump. In one skin there is distinct brindling on the neck, but elsewhere both dark and light areas are almost free from bands, although a few indistinct bars occur on the sides of the chest in one skin. Other specimens show a gradual increase in the number and distinctness of the barrings, accompanied by a lightening of the colour of the coat, so that there seems to be practically a transition to the light-coloured and brindled Kilimanjaro gnu.

THE DUIKERBOK

(Page 141)

The more typical long-eared representatives of the species are found all over South Africa; the most northern form of these on the west being *Cephalophus grimmi splendidulus*, Gray, from Angola; farther east is the Matabili *C. g. flavescens*, Lorenz, which probably crosses the Zambesi into northern Rhodesia; the eastern representative is *C. g. altifrons*, Peters (= *ocularis*, Pet.) from southern Mozambique, which ranges south of the Zambesi to Tette and north to the Loangwa river, at least as far south as Angoniland. In the Shiré Highlands Mr. R. C. Wroughton has shown (*Annals and Magazine of Natural History* for 1910, series 8, vol. v. page 274,) that these long-eared races give place to short-eared types allied to the Abyssinian duikerbok, which is often reckoned as a species, but which may be regarded as a race of the southern one, under the name of *C. g. abyssinicus*. The Shiré race, which on this view will be known as *C. g. shirensis*, agrees in size with the other East African forms, but is distinguished by its brighter ochery coat, the general colour above being ochery buff; all the hairs have drab bases, those of the neck and shoulders are ochery buff to their tips, those of the back shortly tipped with black. Below the colour is the same as in the next race, but much paler.

The second race described by Mr. Wroughton, *C. g. hindei*, is from Nyasaland and characterised by its bright colouring. In size it is about the same as *C. g. nyansae*; its general colour above being tawny ochre, bright on the neck and shoulders, duller on the back and loins, but the yellow tinge is never absent, even on the rump, as it is in *nyansae*; individual hairs of the neck are drab-grey, with ochery tips, but posteriorly the ochery tip becomes a sub-apical ring and the tip black. The chin and insides of the upper part of the limbs are

whitish; the throat ochery buff, with the hairs the same colour throughout, but on the flanks the hairs are coloured like the neck although with drab bases. The grizzling characteristic of the more northern forms in *C. g. shirensis* is so fine and faint that, at a short distance, the coat seems to be uniformly coloured—this and the pale bright ochery colouring serving to distinguish this race from all the rest.

NYASA BLUE DUIKER

(Page 164)

The Congo representative of this species has been described by Dr. E. Lönnberg (*Arkiv för Zoologi*, vol. iv. No. 16, p. 12, 1908) as *Cephalophus nyasae congicus*. It is distinguished from the typical race by colour. In the latter the back is described as being of a darker brown than in *monticola*, with a more distinct rufous suffusion, while the rump is dark chocolate-brown. In the Congo race the back is warm sepia, of nearly the same tint from neck to rump. Towards the flanks this shades off into light smoky grey, with a slight buffy tinge, due to the tips of the hairs being of that colour, while the under surface is white. On the hams the hairs are sufficiently rufous at the tips to communicate a tinge of this colour, although the rest of the hairs are of the same grey as the flanks. The rufous tinge of the hams is sharply defined from the dark sepia-brown of the rump, but shades into that of the back. The legs are rufous, with a smoky brown mark above the sides of the hoofs; the face is nearly black, with a dull rufous brown stripe; and the tail is black above and white beneath.

The skull of both races of *nyasae* differs from that of *monticola* by the great relative length and narrowness of the muzzle.

THE RED DUIKER

In the *Annals and Magazine of Natural History* for 1911 (ser. 8, vol. viii. p. 278) Mr. R. C. Wroughton recognises four races of this species, two of which are named for the first time. Of these the Transvaal *Cephalophus natalensis amaenus* is distinguished by its richer colouring, which is redder on the back and yellower on the flanks, with the nape nearly black, whereas in the typical race the upper-parts

are tawny and the nape slatey grey. The so-called *C. robertsi* of Mozambique (p. 153 of the text), with which, as I have suggested, *C. n. vassei* is identical, forms the third race (*C. n. robertsi*), distinguished by its larger size, paler colouring, and larger ears; the general colour being tawny ochre, with the under-parts paler. Lastly, the Nyasa *C. n. bradshawi*, while agreeing in size with the preceding, differs by the still greater paleness of the colouring, the under-parts being dirty white.

THE KLIPSPRINGER

(Page 166)

The Masai race of this species (*Oreotragus saltator schillingsi*) is distinguished by the general presence of horns in the female. In 1911 Capt. W. H. Wilkin forwarded to the British Museum the skin and skull of an immature horned female of this race killed by himself the preceding September on the Anala river, in British East Africa, about twelve miles from the German boundary (about 1° 45′ S. × 35° E.). Capt. Wilkin, who also shot a second and older female, states that on the Anala all the female klipspringers appeared to have horns, so that he gave up shooting them on account of his inability to distinguish bucks from does. On the other hand, he states that a sporting friend shot a female klipspringer near the junction of the Guaso Nyero and the Guaso Narok which was hornless. This, however, was not improbably an individual variation, as the locality is too near the centre of the range of *schillingsi* to make it likely that a second race should occur there, and it is only reasonable to suppose that some females of that race may be destitute of horns.

Our knowledge of the range of the klipspringer was extended in 1911 by the discovery that the species inhabits the mountains of Northern Nigeria. The first information on this point was afforded by Dr. Porteus, who presented the skull of a buck to the British Museum; but this was supplemented by a letter from Mr. M. Hyatt, in which it was stated that the writer had killed three specimens in the Naraguta district.. I have named the Nigerian race *O. a. porteusi* (*Proc. Zool. Soc.* 1911, p. 960). The skull is characterised by its great width.

According to information supplied by Mr. E. A. Hamilton klipspringers inhabit the mountains of Angola.

THE GUASENGISHU ORIBI

(*Oribia microdon*)

The skull of a male oribi from the Guasengishu plateau of British East Africa is described by Mr. N. Hollister (*Smithsonian Miscell. Collections*, vol. lvi. No. 2, p. 4, 1910) under the above name. It indicates a large species characterised by the relatively small size of the cheek-teeth, which occupy a smaller space than those of species with absolutely smaller skulls. A skull from the Lake Region which came under my own notice in 1911 presented a similar feature; its horns measured $5\frac{3}{4}$ inches in length, or rather more than in the type specimen.

LANG'S DIK-DIK

(*Madoqua langi*)

This species, which was named by Dr. J. A. Allen in the *Bulletin* of the American Museum of Natural History for 1909 (vol. xxvi. p. 153), is described as being indistinguishable in the colouring of the upper-parts from Kirk's dik-dik (*supra*, p. 192), but with the lower surface pale fawn instead of clear white in front and dirty white behind, while the cheeks and the sides of the neck are tawny instead of yellowish grey, and the crown of the head is more strongly varied with yellowish rufous. The two species are, however, best distinguished by the characters of the skull; that of *M. langi* being much the larger of the two, with bigger teeth, relatively as well as absolutely. The lower line of the muzzle of the skull is straight instead of arched, as in *kirki*, and the nasal bones are nearly three times as large as those of the latter, thus leading to the elongation of the fore-part of the skull generally. The type specimen was obtained at Elmenteita, British East Africa, at no great distance from the habitat of *M. cavendishi*. Although the type of the latter indicates an immature individual, yet the skull is much larger than that of the present species, while the skin is differently coloured, being dark fawn above in place of yellowish grey.

THE BEIRA

(Page 278)

Mr. Pocock (*Proc. Zool. Soc.*, 1910, p. 878) regards the beira as related to the dik-diks, and not to the gazelles.

To face page 10 *of Supplement.*

OTHER DIK-DIKS

In the *Ann. Mag. Nat. Hist.* for 1909 (ser. 8, vol. iv. p. 49) Dr. Drake-Brockman described a new race of Phillips's dik-dik from the Guban district of Somaliland, as *Madoqua phillipsi gubanensis*, and a new species from Abyssinia as *M. cordeauxi*. The former differs from the typical representative of the species by its thinner and shorter hairs, which give to the coat a sleeker appearance. The Harar dik-dik (*supra*, p. 190) is relegated by Dr. Brockman (*Proc. Zool. Soc.* 1911, p. 979) to a race of *phillipsi* characterised by its darker colour and thicker coat; it inhabits high ground. The name *M. placentinii* has been given by the same writer (*Proc. Zool. Soc.* 1911, p. 981) to a Somali dik-dik allied to *swaynei*, but distinguished by the much greater development of the grizzling of the hairs, so that the whole of the upper-parts, with the exception of a clay-red nose-patch and the crest, appears grey; the buff ears have black margins.

Cordeaux's dik-dik, on page 983 of the journal last cited, is referred by its describer to *Rhynchotragus*. Having the distinctive head-characters of that group, it much resembles *M. phillipsi gubanensis* in general appearance, but is considerably larger.

Yet another local race, *M.* [*R.*] *guentheri wroughtoni*, from the north bank of the Wabi River, in the foot-hills of Mt. Abu-el-Kassim—far away from the typical locality of the species—has been described by Dr. Brockman (*Ann. Mag. Nat. Hist. op. cit.* p. 51). It is specially distinguished by its larger ears and darker colour. Lastly, *M. erlangeri* (*supra*, p. 190) is referred by Dr. Brockman (*P.Z.S.* 1911, p. 983) to *Rhynchotragus*.

THE WATERBUCK

(Page 194)

In a paper on the waterbucks in the collection of Major Powell-Cotton at Quex Park, Birchington, Dr. Paul Matschie (*Sitz.-Ber. Ges. naturf. Freunde*, Berlin, 1910, p. 409) describes two new races of the typical species. The first of these, *Cobus ellipsiprymnus pallidus* (p. 410), is from the Webbe Shebeyli, Somaliland, and is distinguished from the typical race of the species by the general colour being very light brown, without any tendency to rufous, instead of a mixture of grey and russet brown. The white rings round the eyes are also much narrower; and the hair on the forehead and nasal region is a mixture of pale and sepia brown instead of dark brown. The strong curvature of the horns is likewise a distinctive feature.

In the second race, *C. e. thikae* (p. 411), from the Thika valley, N.E. of Nairobi, the forehead is burnt umber, the nasal region blackish grey-brown, the white band above the muzzle very narrow, and the light rings round the eyes of medium width, with brown hairs amid the white. The sides of the face are bright brownish grey mingled with sepia; the white of the chin ascends as high as the gape of the mouth. The throat and chest are warm sepia or russet mingled with grey; all the hairs being grey with rufous sepia tips; and there is a large white patch in the centre of the chest. The back is reddish sepia, and the flanks are but slightly tinged with grey. Above the hoofs is a white band about an inch in depth, broken by a narrow interval behind; and while the upper surface of the tail is coloured like the back, the under side is white.

In the Lorian Swamp and the neighbouring part of the Guaso Nyiro valley, British East Africa, are found light-coloured or semi-albino waterbucks, with eyes of the normal hue. They are referred to by Col. W. H. Brown in the *Proceedings* of the Zoological Society for 1905, p. 297, and by Lord Gifford in the *Field* of August 10, 1910. The light individuals generally go about with normally-coloured waterbuck.

THE DEFASSA WATERBUCK

(Page 199)

In the paper cited under the heading of the preceding species Dr. Matschie has named and described eleven local races of the

defassa, based on the specimens in the collection of Major Powell-Cotton. These are *Cobus defassa hawashensis*, Hawash river, p. 413; *d. powelli*, Laikipia, p. 415; *d. angusticeps*, do., p. 416; *d. nzoiae*, Guasengishu, p. 417; *d. fulvifrons*, e. of Kitosh, p. 418; *d. avellanifrons*, Lake Albert district, p. 419; *cottoni*, do. ,p. 420; *dianae*, do., p. 421; *d. breviceps*, Pembe on the Nile, p. 424; *d. ladoensis*, Lado district, p. 426; *d. griseotinctus*, n. of Lado, p. 427. Their main points of difference are based on colour.

VAUGHAN'S KOB

(Page 206)

From observations made by Mr. Selous in the Bahr-el-Ghazal (see the *Field*, September 2nd and 9th, 1911) it appears that Vaughan's kob is restricted to the east central, central, and northern districts of that province, and that in summer it turns blackish. On the other hand, the kob of the south and south-western districts is a yellow-eared animal apparently related to the Uganda race of Buffon's kob. The observations, supplemented by heads in the dark dress brought home by Mr. Selous, indicate that Vaughan's kob is merely a local race of the white-eared species. For the present I do not propose so to name it, since, as I have suggested in the text, all the above forms may prove to be local races of Buffon's kob.

ROBERTS' LECHWI

Cobus robertsi

On page 222 of the text this lechwi was stated to have been founded on immature specimens of *C. smithemani*. Mr. Rothschild, who owns the type specimen, informs me, however, that this is not the case. *C. robertsi* appears, indeed, to come closer to *C. leche* than to *C. smithemani*; and is found in company with the former, from which it differs by the black patches on the sides of the lower part of the neck and part of the shoulders, as well as by the admixture of black on the cheeks and the sides of the throat and neck. The horns are also stouter, with the ridges closer together and wider.

This species is a native of northern Rhodesia.

HAY'S GAZELLE

(*Gazella hayi*)

Native name, *Rhazalrim*

This species was named by myself in 1911 (*Proc. Zool. Soc.*, p. 961) on the evidence of a mounted specimen in the British Museum, killed by Mr. M. V. Hay in Algeria, between Constantine and Biskra. Of the size of the dorcas, it is distinguished from that species by the absence of a distinct lyrate curvature to the horns, which carry only about twelve rings in place of twenty-four or twenty-five. The face-markings approximate to those of the edmi, the middle stripe being darker than in the dorcas, with a distinct nose-spot; the eye-stripes are less conspicuous, and the forehead is not chestnut. There is no faint light stripe above the flank-band; the knee-tufts are larger and blacker than in the dorcas; and the tail is brown, in place of black, with a smaller amount of fawn at the root. Apparently the ears are longer than in the dorcas.

THE RED-FRONTED GAZELLE

(Page 258)

The range of the Mongalla (not Mongola) race extends from Gondokoro, in Uganda, northwards to Ber, in the Mongalla district of the Sudan on the Abyssinian side of the Bahr-el-Gebel. The skull of the Libyan race of *G. rufifrons* differs from that of *tilonura* by the greater length of the portion in front of the teeth. In *rufifrons* the length of the tooth-row is $2\frac{7}{16}$ in., and that of the part in front $2\frac{1}{8}$; in *tilonura* these measurements are $2\frac{6}{16}$ and $1\frac{7}{8}$. In the much smaller *isabella* they are $2\frac{1}{8}$ and $1\frac{9}{16}$. Skulls and horns of the three species are figured on page 27.

THOMSON'S GAZELLE

(Page 259)

As mentioned in the "Addenda" issued with the original volume, Dr. E. Lönnberg ("Sjöstedt's Kilimandjaro-Meru Expedition," Upsala, 1908, p. 46) gave the name of *Gazella thomsoni nasalis* to the Kilimanjaro race of this species on account of the absence of a black nose-spot.

Ignoring this, Mr. T. Knottnerus-Meyer, who refers the species to

a separate genus (*Eudorcas*), recognises (*Sitz.-Ber. Ges. naturf. Freunde*, Berlin, 1910, pp. 106-124) no less than thirteen local forms, which are regarded by him as species, although they are, at most, no more than races. Their names are (1) *G. t. baringoensis*, Lakes Baringo and Solei; (2) *t. nahuroensis*, Lakes Nakuro, Naivasha, and Elmenteita; (3) *t. biedermanni*, Shirati district; (4) *t. langheldi*, Usukuma; (5) *t. schillingsi*, from Lake Natron to Kilimanjaro; (6) *t. njiriensis*, west side of Njiri Swamp; (7) *t. sabakiensis*, east side of same; (8) *t. bergeri*, Nairobi; (9) *t. mundorosica*, Mundorosi plains; (10) *t. typica*, south of Kilimanjaro; (11) *t. wembaerensis*, Wembare plains; (12) *t. manyarae*, Lake Manyara; (13) *t. ruwanae*, Ruwana plains. Of these either No. 5 or No. 10 is probably identical with Dr. Lönnberg's *nasalis*; Mr. Meyer regarding British East Africa as the typical locality of the species, whereas Dr. Lönnberg considers that this position is occupied by the Kilimanjaro race.

Apart from certain skull-characters, the races recognised by Dr. Meyer are mainly distinguished by slight differences in the colour of the hair and shape of the horns. As it would occupy too much space to record their differences, and as the number of races may prove to be excessive, the quotation of the names must suffice.

THE BEISA

(Page 284)

The beisa of the Laikipia plateau, British East Africa, has been described by Mr. N. Hollister (*Smithsonian Misc. Collections*, vol. lvi. No. 2, p. 7, 1910) as *Oryx annectans*, as it appears to form a link between the typical representative of the species and the fringe-eared Kilimanjaro race. It is, however, only a local race, and should be known as *O. beisa annectans*.

THE SABLE ANTELOPE

(Page 290)

On page 35 of Dr. J. E. Gray's "Catalogue of Ruminant Mammalia in the British Museum," 1872, reference is made to a variety of the sable antelope, for which the name *kirki* was suggested. Its supposed distinctness was based on a statement by Sir John Kirk in the *Proceedings* of the Zoological Society for 1864, that in the Batoka Hills, to the north of the Zambesi, all the sable antelope are rufous.

In 1910 Mr. E. Heller (*Smithsonian Misc. Collections*, vol. liv. No. 6, p. 1) proposed the name *Ozanna roosevelti* for the sable antelope of the Shimba Hills, British East Africa, basing his description on a female skin. Compared with the typical South African animal, the specimen is stated to have the upper-parts much lighter, only the dark head-stripes, throat, and fore-legs being black, while the general body-colour is light chestnut. There is also less marked contrast between the dark and light face-stripes, the light ones being buffish yellow in place of white. The head of a male from the same region in the British Museum, presents, however, no appreciable difference in colour from Mashonaland bucks; and it is thus quite clear that the East African animal is, at most, nothing more than a local race of the sable antelope, which may be characterised by the paler colouring of the female, and perhaps by the relatively late age at which the dark livery is assumed. At present there is nothing to distinguish the British East African animal from *Hippotragus niger kirki* of the Batoka Hills; but if it should eventually be proved distinct, it should be known as *H. n. roosevelti.*

THE ELAND

(Page 305)

In the sixth edition of Mr. Rowland Ward's "Records of Big Game," 1910 (p. 328), I have proposed the name *Taurotragus oryx selousi* for the Mashonaland eland, as typified by the heads figured in Mr. Selous's "A Hunter's Wanderings," one of which is reproduced in plate xii. of the volume to which the present contribution is a supplement. Mashona eland have an incomplete white chevron on the forehead, with a large frontal tuft of brown hair.

LORD DERBY'S ELAND

(Page 314)

The first paragraph in the text should read as follows:—

This magnificent eland, of which a bull from the Bahr-el-Ghazal stood 5 ft. 8 in. at the shoulder, was first known in this country from Senegambian horns and skins sent home by Whitfield, collector for the menagerie then maintained at Knowsley by the 13th Earl of Derby. The name was given in 1847 by Dr. J. E. Gray on the evidence of a pair of horns.

THE BUSHBUCK

(Page 323)

As stated in the "Addenda" to the original volume, the Mweru bushbuck has been described by Dr. Lönnberg ("Sjöstedt's Kilimandjaro-Meru Expedition," 1908, p. 48) as *Tragelaphus scriptus*[1] *meruensis*. It is distinguished from *masaicus* by the lack of white body-stripes, and of a white spot below the eye, although the two cheek-spots are present. The general colour is dark reddish brown on the back and hind-quarters, passing into smoky brown on the shoulders and sides of the chest, while the under-parts are smoky brownish grey, with a white patch on the inner side of the upper part of the legs.

A bushbuck from Nakuru, British East Africa, was described in 1909 by Dr. J. A. Allen (*Bull. Amer. Mus. Nat. Hist.* vol. xxvi. p. 148) as *T. tjaederi*, but may be regarded as a race, with the name of *T. s. tjaederi*. It is stated to be allied to the imperfectly known *T. s. delamerei* of Somaliland, but differs in having the under-parts darker instead of lighter than the back, by the larger size of the white patches on the fore-part of the neck, and by the presence of a long white stripe on the front of each hind-leg corresponding to a black stripe on the fore-leg, instead of white stripes on both pairs. There is also a distinct crest along the back which is wanting in the type of *delamerei*.

The locality of *T. s. meneliki* (*supra*, p. 325) is Arusi-Gallaland near the sources of the Webbe Shebeyli, at a height of about 9000 feet. *L. t. multicolor* also occurs in the neighbourhood of Lake Zwei.

THE NYALA

(Page 331)

On page 333 of the original volume there is stated to be a gap in the distributional area of the nyala, which occurs in the Gaza country of Portuguese East Africa, to the southward of the Sabi river, whence it extends to St. Lucia Bay, but is unknown in the great tract lying between that river and the Zambesi, although it reappears to the north of the latter in the Nyasa district. In 1910 I received a letter from a correspondent at Pretoria, who informed me that he has killed nyala to the south of Zambesi between that river and the Pungwe, although, for

[1] Originally given as *sylvaticus*.

obvious reasons, he is not at present desirous of revealing the exact locality. The only gap now remaining in the distributional area is formed by the tract between the Pungwe and the Sabi, and if the species does not exist there at the present day there can be little doubt that it did so formerly.

THE MOUNTAIN NYALA

Tragelaphus buxtoni

By far the most important addition to the big-game fauna of the continent made since the publication of the "Game Animals of Africa," is the mountain nyala, typified by a specimen shot by Mr. Ivor Buxton in the Sahatu Mountains of Arusi-Gallaland, at a height of about 9000 feet; this and other specimens being described by myself in the Zoological Society's *Proceedings* for 1911 (p. 349).

The conformation of the horns affiliates this antelope to the bushbuck group, from the other members of which it is distinguished by its superior size. From the nyala, which makes the nearest approach in this respect, *Tragelaphus buxtoni* differs in the reported identity of the colour in the two sexes, in the shorter coat and less bushy tail of the male, the presence of two white gorgets on the throat and chest, the absence of any marked difference in the general colour of the lower part of the legs from that of the body, and in the more open spiral formed by the more massive horns. In the type specimen, which is an approximately full-grown but young buck, the horns form about one complete turn, and have the general characters of those of the nyala, but are relatively heavier, and diverge more outwardly with an open spiral. They are obliquely ridged at the base, and the smooth terminal portion is worn yellow at the tip. The length along the outer curve is 37 inches, the basal girth $9\frac{1}{4}$ inches, and the tip-to-tip interval 21 inches.

In general colour the coat, which is rather long and coarse, is speckled brown-fawn, passing into dull tan on the sides of the face, and becoming darker on the front surface of the muzzle, and chocolate-brown on the forehead above the white chevron. The under-parts are lighter, but on the front of the fore-legs and the lower portion of the hind pair the tint becomes darker. There is a short dark brown mane on the neck, continued backwards as a mingled brown and white dorsal crest. The bushy tail is white beneath. The ears, which are much of the same type as those of the nyala, are of moderate width,

bluntly pointed at the tip, and tubular for a considerable distance at the base; most of the long hairs on the inner edges being white, as is also much of the inner surface of the outer margin. The white markings include a not very distinct chevron between the eyes, the usual patches on the sides of the muzzle and chin, a pair of spots on each side of the face below the eye, and a smaller and fainter one behind the same, a narrow but deep gorget on the throat, and a wider but less deep one of a more lunate shape on the upper part of the chest. A curved row of nine spots—some of which are fainter than the rest—extends from a point about over the head of the thigh-bone to the back of the lower part of the shoulder. There is another white spot on each side of the buttocks. The inner surface of the thighs and of the upper portion of the fore-legs is dirty white. A white area occupies the back of each fore-leg below the knee, extending on to the outer and inner surfaces of the limb, but not reaching the pastern; and a somewhat similar area occurs on the hind-leg, extending slightly above the hock. There is a pair of white oval spots on each fetlock some distance above the hoof.

Rowland Ward Copyright.

Head of Mountain Nyala.

In the second head, of an older buck, the horns are of greater length, and much battered on the front surface, and worn away at the tips, of which the left one is broken. They form about one turn and a quarter, and have a more upright direction than in the type specimen, in both of which respects they are more nyala-like. Although the buck to which this head belonged was a member of the same herd as the type, the coat is longer and looser, especially on the throat, where it forms an incipient fringe. The colour is darker and

greyer, being a greyish brown like that of a waterbuck. The face is also darker, the whole of the lower portion being chocolate-brown like that of the forehead, and the tan restricted to the area round the eye, behind which is a small white patch. There is a tendency to rufous in the hair round the muzzle and between the horns. In consequence of the darker colour of the face, the frontal chevron is more conspicuous than in the type; and the upper gorget is very distinct, and continued by means of scattered white hairs almost to the lower one.

Another head of an old buck agrees in essential characters with the one last mentioned; but the body-skin of the same animal differs from that of the type not only in its longer and darker hair and the greater development of the dorsal crest, but in the presence of two indistinct vertical white stripes—one considerably longer than the other—on the hind-quarters, with faint traces of a still shorter third one; a feature in which the specimen makes a further approximation to the nyala.

Although the mountain nyala comes nearest to the species from which it takes its name, in the general form of the head and the character of the tail it is distinctly kudu-like; and it tends to connect the bushbuck group so closely with the kudus as to render the generic separation of the latter from *Tragelaphus* (in which *Limnotragus* may be included as a subgenus) no longer advisable.

THE GIRAFFE

(Page 350)

In part 2 of a paper entitled "Recherches sur l'Okapi et les giraffes de l'Est africain," published in the *Annales des sciences naturelles, Zoologie* (Paris, sér. 9, vol. xiii. 1911), Messrs. Maurice de Rothschild and H. Neuville have described and figured certain East African giraffes which they regard as serving to connect *Giraffa camelopardalis rothschildi* with *G. c. tippelskirchi*. The giraffe of which they give a coloured plate and refer to *rothschildi* is, however, *tippelskirchi*. If its identification with the former were correct *rothschildi* would have to be included in *tippelskirchi*.

A mounted adult bull giraffe from north-east Rhodesia, the skin and bones of which were presented to the British Museum by Mr. H. S. Thornicroft, has been described by myself in *Nature* for 1911 (vol. lxxxvii. p. 484) as *G. c. thornicrofti*. Related, apparently, to *tippelskirchi*,

it differs by the low frontal horn forming a distinct compressed cone instead of an irregular mass, by the forehead and bases of the horns being brown in place of grey, and the uniformly tawny colour of the lower part of the legs; the latter having these either whitish (? old bulls) or tawny and profusely spotted (females and? young bulls). The bull of the Rhodesian giraffe is characterised by the low and conical frontal horn, the grey ground-colour and sparse spotting of the sides of the face, the chestnut-brown forehead, deepening into black on the tips of the horns, the absence of a distinctly stellate pattern on the neck and body spots, which are light brown on a yellowish tawny ground, and the uniformly tawny lower portion of the legs.

A male giraffe from Barotsiland, to the north of the Zambesi, and a female from the same district to the south of that river, have been described by Prof. P. Noack (*Zool. Anzeiger*, vol. xxxiii. p. 354, 1908) as a new species under the name of *G. infumata*. It is stated to be allied to *capensis*, from which one of its points of difference is the rosette-like arrangement of the spots on the hind-legs, which are described as resembling those of a leopard. In the absence of photographs or figures it is difficult to appreciate the other characters given by Prof. Noack; but the animal is certainly not more than a local race, and should therefore, if distinct, be known as *G. c. infumata*.

In 1910 Mr. Knottnerus-Meyer (*Zool. Anzeiger*, vol. xxxv. p. 800) gave the name *giraffa hagenbecki* to an immature female giraffe about six years of age from Gallaland, then living in Mr. Carl Hagenbeck's menagerie at Stellingen. It was at first regarded as referable to *G. reticulata*, but its describer points out that the blotches, which are largest on the body and neck, are dark lustreless brown, separated by a network of white, fairly regular in these regions. On the outside of the thighs, limbs, and head the markings are broken up, and are very small on the forehead and occiput. The hind-limbs and the posterior parts of the fore-limbs are spotted, but the anterior parts of the latter from the knee downwards are white, so that the cannon-bones appear to be marked out. The pubic region and the inside of the thighs are also white.

Messrs. Rothschild and Neuville point out, in the memoir cited that this giraffe, which is certainly not a species, may be a local form of *G. reticulata*, but that, owing to the immaturity of the type specimen, its true affinity cannot at present be determined.

THE NETTED GIRAFFE

(Page 374)

This species was named by Mr. de Winton in the *Annals and Magazine of Natural History* for 1899 (ser. 7, vol. iv. p. 211), and not, as stated in the text, in the *Proc. Zool. Soc.* for 1897.

A piece of skin from the fore-part of the body of an East African giraffe, now in the British Museum, has been described by myself (*Nature*, vol. lxxxvii. p. 484, 1911) as the type of a new race under the name of *Giraffa reticulata nigricans*. It differs from the typical race by the white lines being rather narrower, and the dark areas smaller and brownish rufous, with a tinge of blackness, and a distinct blackish streak or star in the centre. The home of this race is not improbably the Kenia district. To a certain extent it connects the typical *reticulata* with *G. camelopardalis rothschildi*.

THE BUSH-PIGS

(Pages 391-396)

The classification of the bush-pigs (*Potamochoerus*) has been revised by Dr. E. Lönnberg in the *Arkiv för Zoologi* for 1910 (vol. vii. No. 6). In this paper four African species of the genus are recognised, viz., (1) *P. choeropotamus*, typically from the Cape and Natal, but represented in Portuguese E. Africa, Mashonaland, and N.E. Rhodesia by *P. c. mashona*, in the district to the west of Lake Nyasa by *P. c. johnstoni*, in the Mweru district and southwards to the Zambesi by *P. c. nyasae*, and in the Kilimanjaro region by *P. c. daemonis*. (2) *P. hassama* of Abyssinia. (3) *P. intermedius* of the Ruwenzori district of Uganda. (4) *P. porcus*, typically from Liberia to the interior of the Cameruns, but represented in the coast district of the Cameruns by *P. p. pictus*; in the northern part of the western French Congo and southwards by *P. p. albifrons* of du Chaillu; and in the Ubangi district, dividing French from Belgian Congo, by *P. p. ubangensis*, characterised by its white muzzle.

The chief difference from the classification followed in the text of "The Game Animals of Africa" is the relegation of Johnston's bush-pig (p. 395) to the grade of a local race of *P. choeropotamus*, and the recognition of the Uganda *P. intermedius* as a species by itself. The

latter is a very interesting animal, since, as its name indicates, it serves to connect the south-eastern *P. choeropotamus* with the western *P. porcus*.

The face below the eyes and the muzzle are white, with the sensory bristles and a narrow cheek-band above them black. A broad blackish band, blending superiorly into a brownish patch towards the otherwise whitish crown of the head, extends across the forehead between the eyes. The black ears have whitish margins near the tips and some white hairs in the terminal tufts. In the dorsal crest the black bristles have long whitish tips which communicate the dominant colour to the whole. The back and flanks are pale rufous, with a few black bristles; but, with the exception of the whitish chin, the under-parts and limbs are black. The whole coat is long and bristly, as in *P. choeropotamus*, and affinity with that type is indicated by the strong development and mixed colour of the dorsal crest. On the other hand, the general colour and colour-pattern are of the *P. porcus* type, especially as represented by the white-snouted *P. p. ubangensis*.

THE FOREST-HOG

(Page 396)

In the *Proceedings* of the Biological Society of Washington for 1910, vol. xxiii. p. 49, Mr. G. M. Allen shows that in colour and general character the West African forest-hog is identical with the typical *Hylochoerus meinertzhageni*. The Washington specimen shows no very definite warts on the face with the exception of one below each ear; but this is doubtless a feature peculiar to the female. The forest-hog of the Ituri is also regarded by Mr. Allen as not more than a race of the same animal. It is added that the term "giant pig," sometimes applied to these black swine, is a misnomer, for in reality they are not particularly large, although standing high. In the Florentine journal, *Pubblicazioni del R. Istituto di Studii superiori, Sezione di Scienze Fisiche e Naturali* for 1909, Dr. E. Balducci describes a forest-hog from the upper Congo as a new species under the name of *H. gigliolii*. This, however, is probably inseparable from the Ituri *H. m. ituriensis* (*supra*, p. 398) with which the author of the paper appears to have been unacquainted.

The forest-hog figured on p. 397 of the text was shot by Captain W. R. H. Dunn.

THE WART-HOG

(Page 399)

Six local forms of wart-hog are recognised by Dr. E. Lönnberg in the *Proceedings* of the Zoological Society for 1909 (p. 936), namely, the typical Cape *Phacochoerus aethiopicus*, *P. ae. sundevalli* of Natal, *P. ae. masaicus* of the Kilimanjaro area, *P. ae. africanus* of Cape Verd and Senegambia, *P. ae. aeliani* of Abyssinia, and *P. ae. delamerei*, probably from Somaliland. The typical Cape form is distinguished by the shortness and width of the post-orbital portion of the skull; in *aeliani* and *africanus* the same region is much longer, but whereas in the former it is narrower, in the latter it is broad. The post-orbital region is also long in *sundevalli* and *masaicus*, the Natal race having a broader frontal region than its Kilimanjaro cousin: both retain one pair of upper and either one or two pair of lower incisor teeth. Curiously enough, the presumably Somali *delamerei* resembles the Cape animal in the shortness and breadth of the post-orbital region of the skull, and the absorption or loss of all the incisors, although it differs in certain details of skull-structure. Similarity in the above respects in these two races may, it is suggested, have been brought about by similarity of environment.

THE HIPPOPOTAMUS

(Page 403)

In vol. liv. No. 7, of the *Smithsonian Miscellaneous Collections*, 1910, Mr. G. S. Miller describes the skull of a hippopotamus from Angola as representing a distinct species, although it is of course a local race, and should be known as *Hippopotamus amphibius constrictus*. From that of the typical *H. amphibius* of the Nile and north-eastern Africa generally, the Angolan skull differs by the more marked flattening of the upper surface, the much deeper lateral constriction behind the muzzle, the shorter union at the chin of the two halves of the lower jaw, and the proportionately smaller size of the cheek-teeth. In the hippopotamus of the Cape, which was named by the French naturalist Duvernoy so long ago as 1846, and may now be known as *H. a. australis*, the flattening of the skull is carried to a still greater degree, the socket of

the eye is peculiar in having its transverse diameter in excess of the vertical, and there are certain distinctive peculiarites in connection with the teeth.

THE LION

(Page 413)

A pair of lion cubs brought to England by Mr. H. G. Barclay in the spring of 1911 from British East Africa retained the spots—in a more pronounced degree in the female than in male—when about ten months old, and accordingly indicate that the lion of that district is either identical with or closely related to the Masai race of German East Africa.

As the name *Felis capensis* was used in 1781 by Forster, and again by Gmelin in 1788, for the serval, Mr. N. Hollister suggests (*Proc. Biol. Soc. Washington*, vol. xxiii. p. 123) that the Cape lion should be known as *F. leo melanochaetus*, a name given (as *melanochaitus*) by Colonel Hamilton Smith in 1858.

THE SERVAL

(Page 434)

In the *Annals and Magazine of Natural History* for 1910 (ser. 8, vol. v. pp. 205, 206), Mr R. C. Wroughton, who employs for the species the name *Felis capensis*, as being earlier than *F. serval*, described three new races of the serval, namely, *F. s. hindei* from East Africa, *F. s. kempi* from the Elgon district, and *F. s. beirae* from Beira. The first of these (*hindei*), typically from Mashakos, is characterised by its long silky fur, heavy, broad markings, and small size, the length of the head and body being about 25½ inches; *kempi* is darker-coloured, with finer markings, and of rather larger size, the length being about 30½ inches; *beirae* is largest of all, measuring about 33 inches in length, and is further characterised by the narrowness of the lines down the middle of the back, which are much broken up, and also by the small size and abundance of the black spots. The skull and teeth are relatively stout.

THE SPOTTED HYÆNA

(Page 449)

Several new forms of the spotted hyæna—here regarded as races—have been described since the publication of the original volume, in which a previously named race was omitted; Prof. Cabrera has also pointed out, *Proc. Zool. Soc.* 1911, p. 94, that the typical race of the species is probably from Senegambia. The omitted race is *Hyaena*[1] *crocuta leontiewi*, from Abyssinia, described in 1905 by Dr. Satunin in the *Zoologischer Anzeiger*, vol. xxix. p. 556. In 1908 Prof. Lönnberg described, on pp. 16 and 17 of the section on Mammals in "Sjöstedt's Kilimandjaro-Meru Expedition," two East African hyænas, namely, *H. c. kibonotensis* from the Kibonoto plains and *H. c. panganensis* from the Pangani valley. In the *Proceedings* of the Zoological Society for 1911, pp. 97-99, Prof. Cabrera added three other local forms, *viz.*:—*H. c. rufopicta* from the Boran country, *H. c. thomasi* from the Ankoli district of Uganda, and *H. c. nyasae* from southern Nyasaland. Later on the same naturalist (*Bol. R. Soc. Espaň. Hist. Nat.*, 1911, p. 200) named a fourth race, *H. c. nzoyae*, from the Guasengishu plateau of British East Africa. Of these races it must suffice to mention that *rufopicta* is a pale reddish and red-spotted hyæna, very different in appearance from the grey ones of Abyssinia and Uganda; *thomasi* is a pale grey, black-spotted animal; *nyasae* is pale yellowish in general colour, with large dark spots and pale feet; while *nzoyae*, is allied to *thomasi*, but is of a dull yellowish colour without any trace of grey. All these four races, together with Satunin's *leontiwei* (described from the skull alone), and Matschie's *wissmani*, are characterised by the relatively narrow palate of the skull, whereas in *capensis* the same region is much broader.

A spotted hyæna, brought home by Mr. David Davies from British East Africa, probably referable to the Kilimanjaro *Hyaena crocuta germinans*, is characterised by the number, large size, and blackness of the spots, the ground-colour being orange. In these respects it presents a marked contrast to a specimen from Zomba, Nyasaland, in which the spots are comparatively few, small in size, and pale in colour, the ground-colour of the coat being tawny-yellow.

[1] The authors cited separate the spotted hyæna generically from the striped species as *Crocuta* or *Crocota*.

THE AARD-WOLF

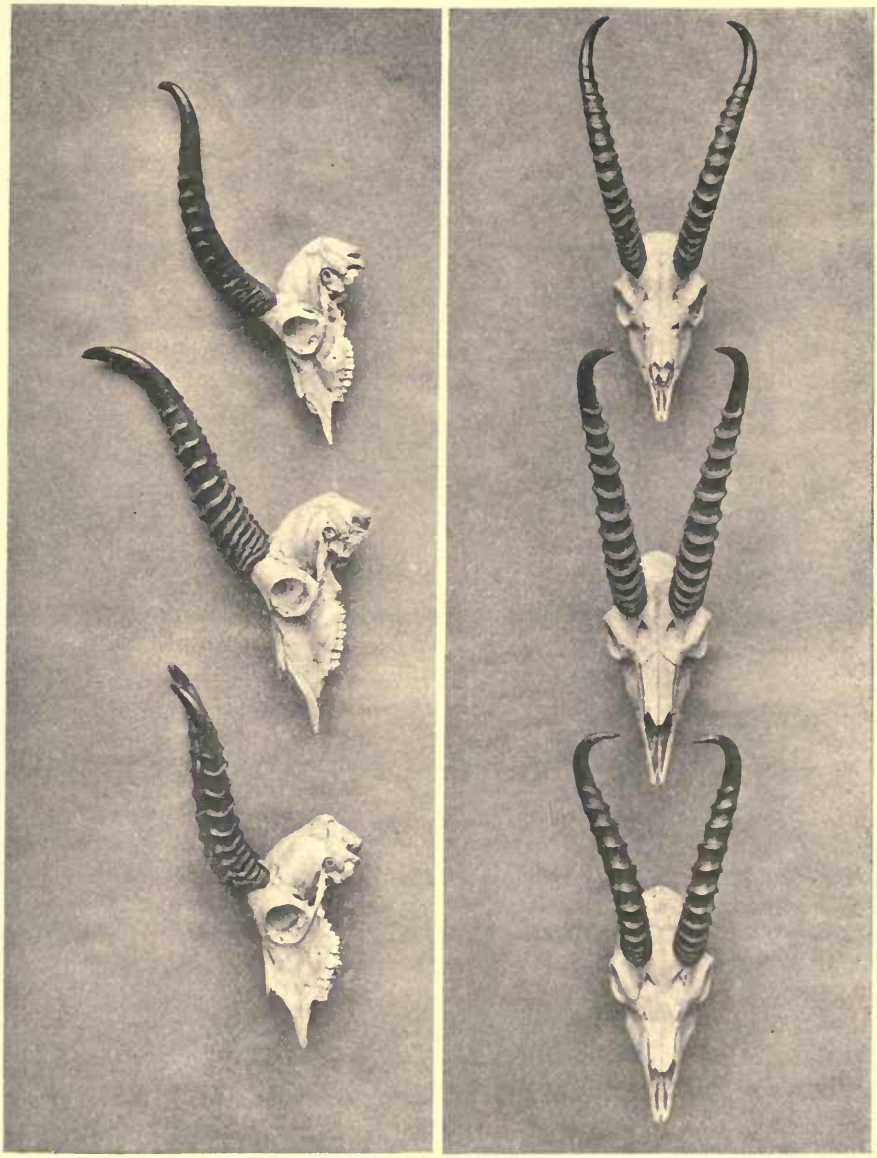
(Page 454)

The representative of this species inhabiting the Suakin district has been described by Prof. A. Cabrera (*Ann. Mag. Nat. Hist.* ser. 8, vol. vi. p. 464, 1910) as a new race, under the name *Proteles cristatus pallidior*. It is stated to be nearly allied to the Somali *P. c. septentrionalis*, but paler-coloured, with less black on the mane and tail, and the feet brownish in place of black.

THE CUBEROW

(Page 462)

In a memoir on the domesticated animals of the Mediterranean Islands published at Zurich (*Neue Denkschrift. Schweiz. naturf. Ges.* vol. xlvi. pp. 115 *et seq.*), Dr. C. Keller shows that the skull of the cuberow presents a remarkable resemblance to that of the prick-eared Ibiza greyhound of the Balearic Islands. So marked, indeed, is the resemblance that the author believes the Ibiza greyhound, which was once represented by an allied breed in Egypt, to be the domesticated descendant of the cuberow. The skull of the former shows a great elevation in the profile of the forehead, but this is evidently a feature due to domestication.



Skulls and Horns of Sudani Gazelles collected by Mr. W. B. Cotton.

A. *Gazella isabella.*
B. ,, *rufifrons.*
C. ,, *tilonura.*

THE GAME ANIMALS OF AFRICA

THE AFRICAN ELEPHANT

(*Elephas africanus*)

Oliphant, CAPE DUTCH ; *Nothlovu*, ZULUS ; *Ncuba*, MATABILI ; *Thlu*, BECHUANA ; *Mbaus* OR *Elkanjauwini*, NDOROBODO ; *Tembo* AND *Ndovu*, MOMBASA ; *Marodi*, SOMALI.

THE African and Indian elephants are the sole existing representatives, not only of the genus and family to which they belong, but likewise of the suborder Proboscidea, which forms a peculiar section of the Ungulata, or Hoofed Mammals. In addition to their huge bodily size and clumsy build, elephants are characterised by the trunk, or proboscis, into which the muzzle is produced, the presence of tusks in the upper jaw, and the peculiar nature of the cheek-teeth. These latter are six in number on each side of both the upper and lower jaw, but only one, or portions of two, are in use at any one time, the series increasing in size from front to back, and the larger hind ones coming up into use as the smaller front ones are worn away and taking their place. Each tooth consists of a number of parallel transverse vertical plates of ivory overlaid with enamel, and united together by a third substance known as cement, which completely fills the intervening spaces ; the number of such plates being least in the first and greatest in the last tooth of the series. When worn down by use, the crowns present a number of narrow ellipses or lozenge-shaped areas of ivory surrounded by a border of enamel, between each of which are masses of cement. The massive cushion-like feet have the position of the toes indicated by broad flat nails, of which there may be either three or four in the hind-limb, and usually five in the fore-limb. The bones of the limbs are placed almost vertically above

one another, as in the human leg, in consequence of which the upper portion of each limb is largely free from the body, instead of being partially enclosed in the same, as in the great majority of Hoofed Mammals. There are, of course, many other striking peculiarities in the structure of elephants, but the above are sufficient to distinguish them from all other living animals.

Externally the African species is characterised by its enormous ears, convex forehead, concave back (of which the shoulder forms the highest point), the presence of tusks in both sexes, the reduction of the nails on the hind-foot to three, and the existence of a finger-like process on both the front and hind margins of the tip of the trunk. The trunk, too, is of a peculiar type, looking as if composed of a number of rings decreasing in calibre towards the tip, instead of forming a continuous indiarubber-like tube. Another distinctive feature is the great freedom of the upper part of the hind-leg from the body. More important than all is the comparatively small number of plates entering into the composition of each molar or grinding-tooth; the worn surface of each of these plates showing a lozenge-shaped ellipse of ivory surrounded by a raised band of the harder enamel.

In common with other species of big game whose range comprises the greater part of the continent south of the northern tropic, the African elephant displays marked local variation; such variations being apparent alike as regards bodily size and shape, the form and proportionate dimensions of the ears, and the length, calibre, and curvature of the tusks. As regards bodily size, adult males from East Central Africa (as exemplified by specimens in the British and Royal Scottish Museums) not uncommonly attain a height at the shoulder of 11 feet 3 or 4 inches; while an elephant from Wadelai is stated to have stood 11 feet 6 inches, and the stature of a specimen from Abyssinia has been given as 11 feet $8\frac{1}{2}$ inches. That monsters may occasionally reach a dozen feet in height is, therefore, by no means improbable, although we have no definite record of such stature being attained; and, indeed, owing to the difficulty of taking measurements, records of large specimens are comparatively few. On the other hand, there seems little doubt that in some part of the Congo territory there exists a relatively pigmy race of elephant, although, as the only definitely known example was not adult when described, details on this point are not yet available.

The largest tusk in England is one from East Central Africa in the collection of Sir E. G. Loder, which measures 10 feet 4 inches in length, with a girth of 26 inches, and weighs 235 lb.; next comes

one in the British Museum, which weighs 228 lb. and measures 10 feet 2½ inches long. Its fellow is reported to have been of the same approximate dimensions. Mr. Rowland Ward had a pair of East African tusks, of which one measured 11 feet 5½ inches and the other 11 feet in length, but their united weight was only 293 lb. Of a pair of tusks from the White Nile, described by Sir William Garstin in the *Field* of December 5, 1905, one weighed 159½ lb. and measured 7 feet 11 inches in length, while the weight of the other was 135½ lb. and its length 8 feet 3 inches. In No. 6 of the *Bulletin* of the Paris Museum of Natural History for 1907 (p. 402) Mr. G. Vasse, an African traveller, gives a photograph of a tusk brought to Zanzibar in April of that year, the weight of which was 97 kilogrammes (about 205 lb.). It is stated at the same time that a tusk from Dahomey exhibited in 1900 weighed no less than 117 kilogrammes (about 250 lb.).

That tusks from different parts of Africa possess distinctive characteristics of their own is a fact well known to ivory merchants and brokers; and it would no doubt be possible to divide the species into local races upon this evidence. Tusks, at any rate with authenticated localities, are, however, by no means common in museums, and it has accordingly been found more convenient to take the ear as the basis for the definition of local races, although in one instance reliance has been placed for this purpose on skull-characters. In the Zoological Society's *Proceedings* for the year 1907 the writer has attempted to classify by ear-characters such specimens of African elephants as were at the time available; but it is practically certain that the local varieties recognised in this communication by no means exhaust the list, and that there are other forms still to be identified.

An important feature in the ear of the species is the point or "lappet" formed by the lower extremity, which varies greatly in shape in the different races; but in addition to this, there is a large amount of local variation in regard to the contour of the ear as a whole, and, likewise, in respect to its relative size.

The four most diverse types of ear are respectively presented by the West African, or South Cameroons, race, in which these organs are nearly oval; by the Addo Bush, or East Cape, race, in which they present a squared form; by the Masai elephant, in which they are small and form an almost equilateral triangle; and by the Abyssinian, or Sudan, race, in which they are very large, and form a long and acutely pointed triangle.

Taking the various races according to their geographical distribution,

we find that in the Addo Bush, or East Cape, elephant (*Elephas africanus capensis*), which now remains only in a protected condition near Port Elizabeth, the ears are rather small, somewhat square in shape, with rounded corners, and a small, sharply pointed angular lappet at the lower angle (fig. 1). The forehead falls away towards the temples, so as to appear highly arched; the fore-legs are relatively short, and the ventral line of the body is stated to be nearly straight, in place of highly convex. A very characteristic feature of this race is a comparatively abundant coat of hair on many parts of the body. The tusks, like those of the next race, are relatively small. In former days this elephant had, no doubt, an extensive range on the east side of the Cape, reaching at least as far north as the Orange River Colony.

Next comes the West Cape elephant (*E. a. toxotis*), now existing only under protection in the Zitzikama forest near Mossel Bay, in which the ears are much larger (4 feet 5 inches in a female 8 feet 8 inches high), long, and semi-oval in shape. In the Matabili or Mashonaland race (*E. a. selousi*) the ear is much less elliptical than in the West Cape elephant, and approaches more to that of the Cameroons race, although less completely oval. This race formerly inhabited all Matabililand and Mashonaland, and is represented by a mounted head in the Imperial Institute shot by Mr. J. Sligo Jameson, the companion of Mr. F. C. Selous. The tusks are of medium size.

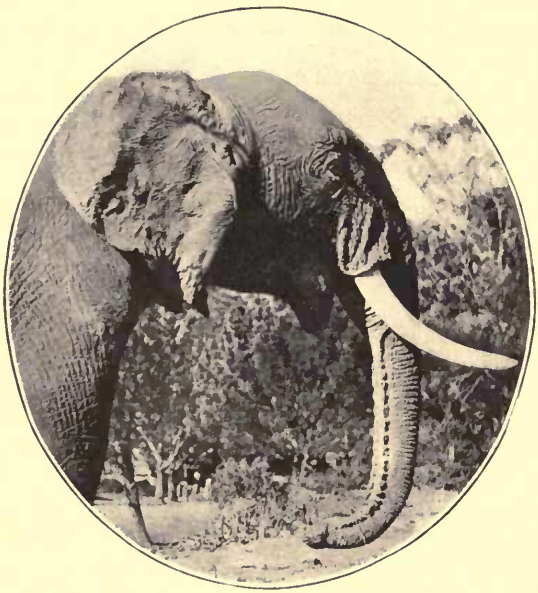


FIG. 1.—Head of East Cape Elephant from the Addo Bush.

Very distinct is the West African elephant (*E. a. cyclotis*), typically from South Cameroons, in which the ears are very large, but of quite different shape, the contour being a regular, short oval, and the lappet

in the form of a half-ellipse. The skin presents a mosaic-like appearance, and its colour is of a paler grey than in most other races. This race was named on the evidence of a young specimen in the Berlin Zoological Gardens, the head of which is here shown (fig. 2). The Congo elephant (*E. a. cottoni*) apparently comes very close to this type, but has the ear less regularly oval. Its tusks are very long and slender.

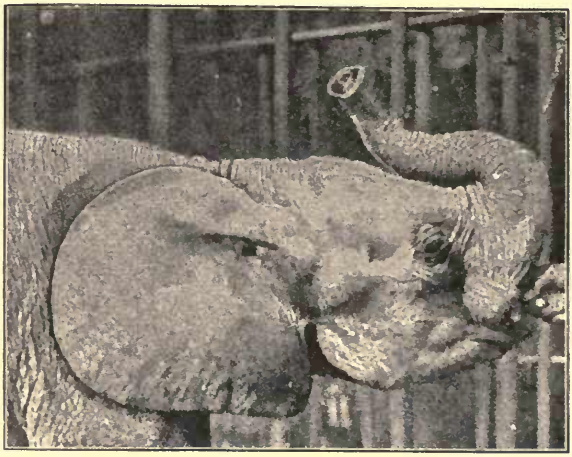


FIG. 2.—Head of the West African or South Cameroons Elephant, from Heck, *Lebende Bilde aus dem Reiche der Tiere.*

The Masai race (*E. a. knochenhaueri*), typically from German East Africa, is a very large elephant, with small, regularly triangular ears, with the lappet angulated and pointed. A mounted specimen in the British Museum (fig. 3) from near Fort Manning, north-east Rhodesia, standing 11 feet 4 inches in height, with ears measuring 4 feet $2\frac{1}{2}$ inches by 3 feet 5 inches, either belongs to this race or indicates a closely allied type. Although a male in the prime of life, that is to say, with the last molar tooth just come into use, it has relatively very small tusks.

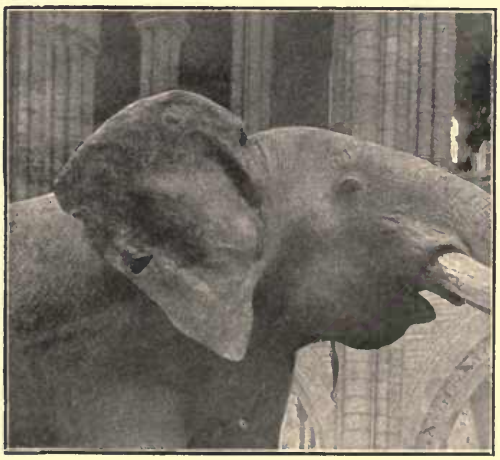


FIG. 3.—Head of the North Rhodesian Elephant in the British Museum.

In the Aberdare elephant (*E. a. peeli*), typically from the Aberdare Mountains, British East Africa, the ears are pear-shaped, with the

lappet much elongated, although somewhat rounded at the tip; and the tusks are very long and slender. The type specimen of this race

FIG. 4.—Male Elephant, probably belonging to the Lake Rudolf race, in the Royal Scottish Museum, Edinburgh. Mounted in the Rowland Ward Studios.

is preserved in the private museum of Mr. C. V. A. Peel at Oxford, but an elephant's head from south-east Africa in the Hon. Walter Rothschild's museum at Tring (fig. 5) apparently belongs to the same type.

Somewhat farther to the north-east we have the Lake Rudolf elephant (*E. a. cavendishi*), which is nearly allied to the last, but has broader ears, with a shorter lappet. In the type specimen, which was killed by Mr. H. S. H. Cavendish to the east of the Lake, and is in

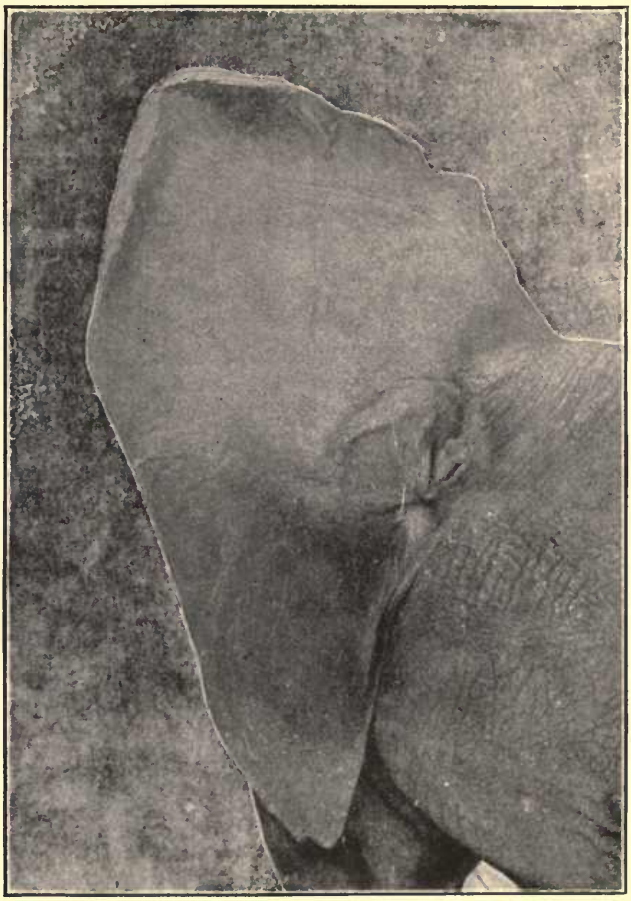


FIG. 5.—Part of the head of the Aberdare Elephant, from a specimen in the Tring Museum.

the British Museum, the ears, inclusive of the fold, measure 4 feet 10 inches in depth by 2 feet 11 inches in breadth, and the tusks are of medium size. An elephant in the Royal Scottish Museum at Edinburgh, killed by Major Powell-Cotton in the Lado enclave, about five degrees north of the equator, may be provisionally assigned to this race. The ears in this specimen (fig. 4) measure, exclusive of

the fold, 4 feet 6 inches in depth, or practically the same as in the type.

The race most commonly seen in European menageries is the Abyssinian, or Sudan, elephant (*E. a. oxyotis*), in which the huge ears form an elongated triangle, with the upper border rounded and the lappet very sharply pointed and angular. This elephant attains very large dimensions, specimens of the ears (fig. 6) measuring as much as 6 feet 5 inches in vertical diameter; but the tusks do not attain the enormous length of those of the Aberdare and, perhaps, some other East Central African elephants. The elephants of the Blue Nile belong to this race.

A remarkable contrast to the preceding is presented by the North Somali elephant (*E. a. orleansi*), which is a small race, with the upper border of the small ears straight, and the lappet short and distinctly defined. It is represented by a head in the collection of the Duke of Orleans at Wood Norton.

The last of the races named on the evidence of the ear is the West Sudan elephant (*E. a. rothschildi*), in which the ears are in some respects intermediate between those of the Abyssinian and those of the West African race, although approximating to the former in the shape of the lappet. This race was represented by the well-known "Jumbo," formerly living in the London Zoological Gardens, and by "Sahib," of the Paris Gardens, both of which were imported at the same time. The race attains very large dimensions, but the tusks do not seem proportionately big.

The Albert Nyanza elephant (*E. a. albertensis*) is characterised by the short broad skull, and the concavity, or emargination, of the hind border of the ear. A head from Unyoro, Uganda, presented to the British Museum by Mr. G. M. Norrie, apparently belongs to this race. In addition, there is the above-mentioned dwarf elephant from the Congo (*E. a. pumilio*).

The following account of the history and habits of elephants in Southern Africa is abbreviated from one furnished by Mr. F. C. Selous:—

"With the exception of a limited number [of the West Cape race] preserved in the Zitzikama forests near Mossel Bay and [of the East Cape race] in the Addo bush near Port Elizabeth, together with a couple of herds wandering some years ago in the neighbourhood of the Maputa river, south of Delagoa Bay, elephants have been exterminated to the southward of the Limpopo. In Khama's country, if we except a few herds which may enter its northern fringe during

the rainy season from the district between the Chobi and Okavango, the elephants twenty years ago were reduced to a single herd frequenting the dense thorn-jungles between Sode Gara and the chain of permanent springs known as Umthlabahanyana. These elephants [which belong to the Matabili race] used sometimes to live together in one large herd, and at others to break up into several

FIG. 6.—Part of the head of the Sudan Elephant, from Heck, *Lebende Bilde aus dem Reiche der Tiere.*

parties. In 1884 the entire herd numbered at least a hundred, among which were four huge bulls. Between the Chobi and the Zambesi there were numbers of elephants thirty years ago, and some may still survive. In 1891 I saw tracks of several large herds in the country between the Buzi and Pungwi rivers; while in 1892 I came across some elephants between the latter river and Lake Sungwi. In northern Rhodesia, among the hills and forests lying between

the high plateaus and the Zambesi, there was at the same date a good number of elephants, especially in the dense wait-a-bit-thorn jungle to the west of the Gwai river. In these vast areas of country, which can never be inhabited by Europeans, elephants will probably continue to roam for centuries, even without special protection, as the natives of Matabililand and Mashonaland, if not completely disarmed, can do but little harm; while in a country where the big tuskers have been shot and the survivors rendered wild and cunning, with an enormous extent of country over which to roam, it will not pay Europeans to hunt them for profit.

"The average height at the shoulder of full-grown male elephants in southern Africa ranges from 10 feet to 10 feet 6 inches. This appears somewhat less than the average in the neighbourhood of Lake Rudolf, where Mr. A. H. Neumann ascertained by measurement that old bulls usually stand about 10 feet 8 or 9 inches at the shoulder. The average size of the tusks is, I believe, always less in southern than in equatorial Africa. No large tusks have been obtained in the Addo bush or the Zitzikama forest, where the bulls seldom grow tusks exceeding 45 lb. in weight. When I first visited Matabililand, in 1872, although the elephants inhabiting those parts of the country where there was no tsetse-fly had been much harried by English and Boer hunters, the greater part of the fly-infested districts had scarcely been touched; and there were still many parts of the vast area between the plateaus of Matabililand and Mashonaland and the Zambesi where the elephants had never been molested. During the next few years, however, swarms of Lo Bengula's hunters, besides a small number of Europeans, waged constant war on the elephants, and killed most of the big tuskers. Between 1872 and 1874 not less than 60,000 lb. weight of ivory was sold to traders by Lo Bengula; and if we add to this amount 40,000 lb. (which is a low estimate) for the ivory obtained by Europeans and their native hunters in Matabililand during that time, we have a total of 100,000 lb. of ivory obtained in this district in the three years preceding 1875. Most of this ivory I saw, and I also heard of all the exceptionally large tusks either traded from Lo Bengula or obtained from elephants shot by Europeans; while in 1874 I saw many tons of ivory obtained from Sipopo, then paramount chief of the Barotsi. I think, therefore, that I am justified in expressing an opinion as to the average size of elephant-tusks in the interior of South Africa, before the herds had been decimated and the finest tuskers destroyed. The ivory brought from the country immediately north of the central Zambesi averaged somewhat larger

than that from Matabililand, where the tusks of big full-grown bulls weighed, as a rule, from 40 lb. to 60 lb. Tusks weighing over 60 lb., though not numerous, were, however, by no means uncommon; but those over 70 lb. were few, while a weight of over 80 lb. was very uncommon.

"Many thousands of bull elephants have been killed in South Africa during the last seventy years, but out of that number probably less than fifty carried tusks weighing 100 lb. each, although a few of abnormal size have been recorded. One such large tusk was, for instance, brought to Bamangwato from the Lake Ngami district in 1873 by a Boer hunter named Bauer, which weighed 174 lb. This was a single tusk bought from the natives; and whether it originally belonged to a one-tusked elephant, or whether its fellow was broken or disposed of elsewhere, is unknown. An elephant carrying enormous tusks was wounded and lost in 1868 or 1869 by a Boer hunter named Potgeiter in the bush between the Vungo and Gwelo rivers within seventy miles of Bulawayo. It was found dead a few days later by a native hunter, and its tusks, which came into the possession of a trader at Bulawayo, measured 9 feet in length, and weighed, together, a little over 300 lb. A pair of tusks of about the same weight was obtained from Umzila, king of the Gaza Zulus, in 1874 by Mr. R. Benningfield of Durban. The elephant with the largest tusks shot by a European in South Africa is, however, apparently one killed on the Zouga river in 1849 by Oswell, who recorded the aggregate weight of the tusks at between 230 lb. and 240 lb., and their length rather less than 8 feet. The elephant itself was the smallest of all the old bulls shot by Oswell.

"Cow elephants in South Africa, when full grown, carry tusks weighing on an average from 10 lb. to 14 lb.; tusks of 20 lb. weight were always rare, though I saw one which weighed 39 lb., while its fellow was nearly as heavy. Although, as a rule, both sexes of African elephants carry tusks, in every herd there used to be one or two, or sometimes more, tuskless cows; but in all my experience I have seen only one tuskless bull. Both cows and bulls occasionally have but one tusk, and when that is the case there is no rudimentary tusk on the opposite side, the tusk-sheath being filled with solid bone. More than once I have noticed the calf of a tuskless cow with well-developed tusks. Nowhere in South Africa have I observed the tusks of either bull or cow elephants to be of unequal size owing to the fact of one having been exclusively used for digging; neither do I believe that in this part of the country are the tusks commonly used for such

a purpose. I have, indeed, frequently seen acres of sandy ground dug into holes by a herd of elephants in search of roots, but the digging was not done with the tusks. On the contrary, the *modus operandi* was as follows:—The position of a root underground having been ascertained with the outstretched trunk by means of smell, the elephant would dig down with its fore-foot, scraping out and throwing backwards the sand, just as a dog does when trying to unearth a rat. When the root—usually one growing horizontally—was laid bare, the elephant would stoop down, and, getting its tusk underneath, prise it up, break it in two, and pull the tapering end from the ground with its trunk, when it would chew the piece for the sake of the sap and the bark, and finally spit out the wood. On three occasions I have, however, found a freshly broken piece of a tusk about a foot in length jammed under a root, which it had not been strong enough to break. Two of these broken tusks were those of cows, but one belonged to a big bull, the fragment broken off weighing at least 10 lb. When an elephant has broken the end off one tusk, the rough edges of the broken surface are soon worn away, when the owner is known as a stump-tusked elephant. Old cow elephants often have both tusks much worn, with their tips flattened at the sides, so as to form a wedge-shaped point, and I at one time attributed this wearing away, not so much to actual work in obtaining food, as to rubbing against trees.

"Be the reason what it may, it is, however, noticeable that, while elephants living in districts where the soil is soft and sandy usually carry perfect tusks, those frequenting broken, hilly country, where the soil is hard and stony, scarcely ever have both tusks perfect, whilst both are frequently more or less broken. How the tusks become broken I do not know, as I cannot recall much evidence of elephants digging in hard ground.

"Elephants in South Africa feed upon leaves, bark, roots, palm-nuts and wild fruits of various kinds, rarely eating grass. In the Zambesi district elephants are very fond of the bark of a tree known to the Matabili as machabel. These trees often grow to a height of 30 or 40 feet, with stems over a foot in diameter. Using their tusks like blunt chisels, elephants will cut through the bark at a height of 4 or 5 feet from the ground, and then, getting hold of a piece with their trunks, will, by pulling, strip off a segment of the stem, right up to the top of one of the highest branches; the bark peeling off very easily and not breaking while being ripped from the stem. I have often followed a herd of elephants for miles through the machabel forests of northern Mashonaland, without ever looking for their tracks on the ground, by

simply keeping on the line of the trees that had been thus peeled. Only the thin inner layer of the bark, used for the manufacture of rope and string by the natives, and having a sweet taste, is eaten by the elephants. Small trees of 2 or 3 inches in diameter the elephants break down with their trunks, but larger trees they butt down. Pushing with the thick part of the trunk, they get the tree on the swing, giving way as it swings towards them, and following it up as it goes back, till it finally yields. During the dry season fruit-bearing trees over a foot in diameter are often broken clean off at a height of 2 or 3 feet from the ground; while in the rainy season, when the soil is soaked and the roots of certain kinds have little hold in the ground, trees of much larger dimensions are overthrown. On one occasion I saw a young bull elephant push down an umglosi tree (a species bearing a sweet-tasted fruit), when all the young elephants in the herd immediately rushed up and commenced to pick off the fruit with their trunks, and conveyed them one by one as quickly as possible to their mouths.

"South African elephants not unfrequently collected in herds of from one to four hundred individuals; these large herds being composed almost exclusively of cows and calves with a certain number of young bulls. Old bulls seldom herd with the cows, although I have seen apparently full-grown bulls amongst a herd of cows, and once when following the tracks of eight or ten old bulls, came up with them standing close to a troop of cows and calves. As a rule, old bulls keep to themselves, and may be seen either singly, or in parties of two or three up to a dozen together. Solitary bulls are not more vicious than others, and really big old bulls are usually less savage than cows and young bulls.

"In South Africa elephants seem fond of climbing to the top of hills, often over very broken rocky ground, but do most of their climbing at night. Uphill they go at a slow pace, but in descending they come down like an avalanche when frightened or angry, and will negotiate steep places by sitting down and sliding on their haunches. Elephants are good swimmers, and thirty years ago it was common for them to cross the Zambesi by night between the Victoria Falls and the mouth of the Chobi. According to native accounts, they swim with their heads and part of their tusks above water.

"Young South African elephants have a number of long coarse hairs round the aperture of the ear, which gradually disappear as they grow up. Like rhinoceros calves, young elephants will remain by the carcases of their slaughtered dams, when they will charge anything

that approaches with superb fearlessness, raising their ears and screaming lustily the while. On one occasion I saw a calf so small that, when it charged, I seized it by the trunk with one hand, and catching hold of one of its fore-legs with the other, was able to throw it on its back.

"In districts where food is abundant, and where they feel themselves secure from molestation, elephants lead a lazy life and do little travelling. They feed at nights and in the early mornings, after which they will stand sleeping till late in the afternoon, sometimes in the shade of trees, but more often in jungle not high enough to completely cover them, when their backs and the tops of their heads are exposed to the full heat of the sun. As they stand sleeping or dozing, they keep continually moving their great ears, twitching them slightly forwards from the neck at frequent and regular intervals. This constant movement of the ears may be intended to keep flies off their necks, over which they often blow fine sand, possibly with the same purpose. Where food is scarce and scattered, or where they are much hunted, elephants travel enormous distances, resting only during the hottest hours of the day. In the forests on the northern slope of Mashonaland, where some years ago there were still many herds, and where the sun was not intensely hot at any time of day in winter, it appeared to me that the elephants scarcely took any rest. At any rate, I have known them travel all day without resting, feeding as they went. In hot weather elephants drink every night, if possible, but on the Chobi river I think that during the cold season they only drank on alternate nights. Although I have often seen places where they have rolled, or rubbed themselves on the side of ant-heaps, I have never either seen elephants actually lying down to rest, or found marks on the ground where they had been lying; and I conclude that, except when rolling in mud and water, the African elephant never lies down during its whole life. Neither the period of gestation nor the age attained by the African elephant has been ascertained with accuracy.

"There is probably no animal possessed of keener smell than the African elephant. The sense of hearing, although by no means remarkably acute, is also fairly well developed; but in the matter of eyesight the species is decidedly deficient, as it cannot distinguish a human being from a tree-stump, even when the former is standing in full view within fifty yards. Any movement will, however, be at once noticed. In one respect the South African elephant is extremely timid, and it will do everything in its power to avoid meeting a human being. When actually attacked, elephants are often very savage, and

the more they are hunted, the more vicious they become. When a herd is pursued on horseback, an individual will very often charge as soon as it sees its enemy approaching, before a shot has been fired. Sometimes one will run out, screaming loudly, with its trunk held high in the air, on hearing a shot fired; but, after going a short distance, will suddenly stop screaming, drop its trunk, and return to the herd. When an elephant is vicious and inclined to charge, it holds its tail straight up, continually cocks its ears, and looks from side to side for its enemy, at the same time trying to get his scent with its raised trunk. When standing wounded, an elephant, if it thinks it sees its foe approaching, raises its head and trunk and spreads its great ears; and should a movement or a whiff of tainted air turn its suspicions to certainty, it will very likely charge immediately, screaming like a railway-engine. When commencing its charge, the African elephant often, perhaps usually, has its trunk raised aloft; but immediately it settles to a regular chase, the trunk is dropped and held in front of the chest, though not coiled up under the jaws after the manner of that of an Indian elephant when charging. The charge of an African elephant, especially a cow or young bull, is so swift that probably 120 yards may be covered in ten seconds; and, with a few yards' start, only a very active man could keep ahead even for 60 or 70 yards. No matter how fast it may be travelling, an elephant never attempts any pace but a kind of shuffling trot. When alarmed, elephants do not run far, but settle down to a quick walk, known to South African hunters as 'de long stap,' which a man must run at a good jog-trot to keep up with; this pace they can maintain for many miles. When chased during very hot weather, either on horseback or by good runners on foot, elephants quickly show signs of being distressed. They soon commence to put the tips of their trunks into their mouths, and drawing about a bucketful of water from their stomachs, squirt it over their shoulders. Sometimes, when the water-supply is exhausted, they will pick up sand and blow it over themselves. If the proportion of charges to the number of animals shot be any criterion, my experience is that the African elephant is more vicious when irritated than the buffalo. Fortunately, a charging elephant can almost always be turned by a shot as he is coming on, no matter where the bullet may strike. When charging, African elephants usually keep up a quick succession of short sharp screams of rage, but sometimes they are silent.

"During the rainy season elephants become excessively fat, and if not much hunted cows often keep in very good condition all the year

round. Elephant-meat, though very coarse-grained, is well flavoured; and every portion of the carcase, except the hide and intestines, is utilised for food by the natives. The skin of the stomach is made into a blanket; and the leg-bones, which contain no marrow, when chopped up and boiled yield a quantity of fat. The portions of an elephant most fancied by the old professional South African hunters were the heart, the thick part of the trunk, the fat meat contained in the large hollow above the eye, and the foot. The last should be roasted, in its skin, in a hole dug in the ground over which a large fire is kept burning for about forty-eight hours, when the inside becomes gelatinous, and can be scooped out with a spoon; in taste it resembles calf's head.

"In the centre of the hollow above the eye of the African elephant are two small holes or pores in the skin, through which the animal appears to perspire, as this part of its head always looks black and damp after a run in the hot sun. These pores are almost invariably plugged with fragments of stick, which may sometimes be about half the thickness of a lead-pencil. The ends of these twigs never showed from the outside, and I found the first by accident, after which I looked for them. How the pores become thus plugged remains a mystery.

"Before the introduction of fire-arms elephants were generally killed by the natives of the interior of South Africa by means of heavily shafted assegais, plunged into their bodies from trees, and left to work in deeper and deeper. Sometimes, however, they were ham-strung while standing asleep with broad, thin-bladed axes made for the purpose: if the back-tendon was severed by the stroke, the elephant became helpless, and could be despatched at leisure with assegais, but if this was not cut, it went off and probably recovered. With either a fore or a hind leg broken an elephant can scarcely move at all; and with a broken shoulder will stand quite still, with the foot of the injured limb doubled up and resting on the toes. If approached when in such a plight, the poor brute will raise its ears and trunk and scream with rage, and finally, in all probability, pitch on its head in a vain effort to reach its enemy. Sometimes, though seldom, elephants are caught in pitfalls by the natives, but I have never known any but young animals secured in this manner. As a rule, a herd of elephants will walk through a series of pitfalls without loss, uncovering them one after another. Cows with small calves are liable to be vicious, but when a herd is pursued, if a calf be too young to keep up with its mother, it is allowed to drop out and take its chance. On three occasions I have

seen full-grown elephants show great solicitude and put themselves into positions of danger to save a wounded comrade."

The following notes on elephants in British East Africa are extracted from material supplied by Mr. A. H. Neumann :—

"In East Equatorial Africa the elephant still holds possession of its primeval domains, although it must not be supposed that the whole country is one vast elephant-preserve. Indeed, one might almost travel through the length and breadth of the land without seeing elephants if they were not specially sought for. Immense tracts are

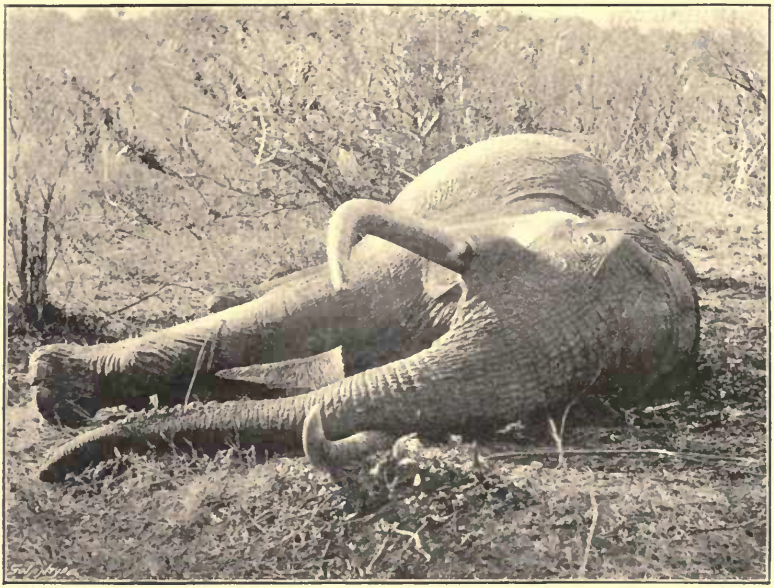


FIG. 7.—Elephant shot at Mount Marsabit, from a photograph by Lord Delamere.

unsuited to their wants, and, though they may wander through these on migration, it is only in certain widely separated localities that all the conditions of food, water, and covert are suitable. Avoiding, as a rule, thick forests, elephants prefer dense but shadeless scrub, little or no taller than themselves :—in the mountains, and sometimes by the rivers, with a profusion of small, rough, rasping leaves, but elsewhere parched and thorny. The covert may, however, be of giant grass, almost more dense than the scrub.

"In such places you may hear, and even smell, the elephants ; but, unless you approach within a few yards, you are not likely to see

them. And even when, by perseverance and caution, you have arrived almost without arm's reach, perchance only a forehead, a foot, or a waving ear may be visible.

"These coverts are scattered, sometimes at wide intervals, through the country, from close to the coast, as in the neighbourhood of the lower Sabaki and Tana rivers; but no herd is confined to any one neighbourhood, each varying its feeding-grounds, and traversing wide tracts, generally by night, when moving from one locality to another, either in search of food or water, or on account of being disturbed, or from caprice. Well-beaten paths generally connect these different resorts; in fact, so continuously are they thus linked that it is impossible to say where may be the limit of the range of any particular herd. Climatic conditions have also much to do with the movements of elephants. During long periods of drought they repair to the mountains, where rain is more frequent and water abundant; while during the wet season they wander over drier and more open country, which is shunned at other times. The most favourable localities are, however, generally in the neighbourhood of mountains, or near rivers and lakes.

"The herds are sometimes very large, occasionally comprising as many as two or three hundred head, though such herds often break up into small parties, which scatter through a district. These, however, keep up communication among themselves, so that when they leave the locality, they do so, if not quite together, within a day or two of one another, such portions as remain following in the tracks of the rest. To a certain extent the behaviour of elephants varies in different districts, according to whether the natives are skilled in the chase; the same herd being more wary in the latter case than under safer conditions.

"One of the biggest bulls I killed measured 10 feet 9 inches in height at the shoulder, and 12 feet 8 or 9 inches in length from the root of the tail to the eye; while the circumference of the fore-foot was 5 feet. Several other bulls were hardly, if at all, inferior to this one; and the average height of full-sized males in this part of the country may be put down at from 10 feet 6 to 10 feet 9 inches. Probably some individuals may stand 11 feet, but I doubt having ever seen one 12 feet high.

"Male elephants accompanying the herds of cows commonly have tusks of about 50 lb. each, while the average of those of other bulls would be from 60 to 80 lb. Tusks of the latter weight would probably measure about 6 feet in length, of which one-third would be in the head and two-thirds protruding; while they would be

about 18 inches or so in greatest basal girth. Much larger tusks are, however, known, some of which are referred to in an earlier paragraph. Cow-tusks commonly weigh from 12 to 24 lb. each, although in an exceptionally fine pair the weight was 36 lb. East African ivory is of the best quality, being what is called in the trade 'soft ivory,' which fetches a higher price than the 'hard ivory' from the west coast. Even in soft ivory there is, however, great variety in quality, and a corresponding range in value; 'kalasha,' or cow-tusks

FIG. 8.—Elephants photographed by Lord Delamere on the lower slopes of Mount Marsabit, in the Rendili district, to the S.E. of Lake Rudolf.

of from about 12 lb. to 16 lb., being the most valuable, on account of its suitability for billiard-balls.

"In this part of the country the tusks are sometimes used for digging up roots, by which a piece may be broken off the end; but when both are entire, one, generally the right, is almost always more worn than its fellow.

"Tuskless elephants are almost unknown in this part of Africa, and I myself have never seen one. Individuals with only one tusk are, however, occasionally found; but I believe the tradition that a single tusk is generally of abnormal size to be without foundation.

"Owing to the nature of the country they frequent, the pursuit of elephants is a somewhat dangerous sport. Great skill in marksmanship is not the quality most needed in elephant-shooting; endurance, litheness, aptitude for taking the best advantage of circumstances, and, above all, coolness and self-control at the supreme moment being of more importance. At the very close quarters at which the shot has generally to be taken, there is not much room for bad shooting, if only the hunter keep calm.

"Elephant-hunting is the most arduous and exacting of all field-sports, and, when persistently followed up, entails a tremendous strain on the system.

"In hunting elephants the direction of the wind is the most important consideration. They are exceedingly keen-scented, and the slightest suspicion of taint in the air will put them on the alert, and set them feeling with the sensitive tips of their uplifted trunks for the faintest breath of confirmation of the proximity of their enemy, man. On the other hand, as their sight is not good, the sportsman who is careful not to expose himself when creeping up, and when in full view to remain motionless, is not likely to be readily detected. If it were not for this, elephant-hunting would be almost equivalent to suicide. Although their hearing is acute enough, elephants are so accustomed to all sorts of sounds made by their companions that they are not easily alarmed by slight noises unless evidence of danger is apparent to other senses. Even the report of a gun does not disturb them in districts where they are unaccustomed to it. The Ndorobo natives affirm that elephants cannot keep silent for long; and cows and calves are particularly noisy, a loud cry (made apparently by the latter) often coming from the herds.

"The hunter on his part must listen intently for any sound betraying the position of his quarry, such as blowing through the trunk, and especially the frequent intestinal rumblings.

"Since opinions differ widely, I will not make any assertion as to the kind of rifle best suited for elephant-shooting, but will only mention that I have killed many elephants, including several big bulls, with a service Lee-Metford and solid bullet cartridge; adding that, in my opinion, penetration is the most important element. The brain is easily reached by a side-shot in front of the orifice of the ear, and, if successful, this shot is instantly fatal. The heart is, however, a surer mark, though the effect is not so sudden.

"The Ndorobo kill elephants, chiefly for the sake of the meat, with an assegai thrown from the hand at close quarters, the poisoned

barbed head of which remains in the animal, while the handle falls off on contact with the branches. They also set traps, consisting of a similar weapon mounted in a heavy shaft and suspended over a path. The Wakamba organise large hunting expeditions, using small poisoned arrows shot from weak bows, with which numbers of elephants are wounded, but generally lost."

To Colonel H. G. C. Swayne the author is indebted for the following notes, which are, however, given in an abridged form, on elephants and elephant-hunting in Somaliland :—

FIG. 9.—Elephants in the Lake Rudolf district, photographed by Lord Delamere.

"When Europeans first explored the Somali shooting-grounds in 1884, elephants were found on the plains of the interior south of Berbera, between that port and the Golis range, 35 miles inland, and on the Wagar Mountain, south-east of Berbera; while their tracks might sometimes be seen even on the seashore near Doghonkal, between Bulhar and Zeyla. Elephants also existed near Hargeisa, and within two days' march of the Port of Bulhar, as the cold of the highlands of the interior drove them down the dry river-beds when the armo-creepers and aloes, of which they are so fond, were in season. They were likewise numerous in the Gadabursi country. Driven

continually south and east by hunting parties from Berbera, and south-west by others from Zeyla, they have, however, retired from all the above-named districts, except, maybe, a few herds still lingering in the Gadabursi country, now reserved for the Aden garrison. There is thus practically no elephant-shooting north of the waterless plateau of the Haud or in the Haud itself, while in the south-eastern Haud and the coast-country east of Berbera there never were elephants.

"In the rugged gorges descending from the Abyssinian highlands to Ogaden, as well as near the headwaters of the Webbe Shebeley and Juba rivers, elephants are, however, still numerous, although they are in the Abyssinian sphere of influence. A few herds, it is believed, also wander down the river-valleys to the Marehan district, far to the south-east of Berbera, reached by crossing the broadest part of the Haud.

"The Somali elephant is a mountain-dweller, and although bulls attain a height of about 10 feet 6 inches at the shoulder, the tusks are small compared with those from East Africa. From 35 to 70 lb. a pair, and a length of from 4 to 5 feet for each tusk, are about the average weight and measurement, though much larger tusks are occasionally obtained.

"Elephants may be killed by watching at pools on moonlight nights in the dry 'jilal' season, when water is scarce, pools are few and far between, and the game visit the same pool night after night. More generally they are hunted in the daytime either on horseback or on foot. Drinking-places frequented by elephants are visited in the early mornings, and if fresh tracks are found, showing that the game has been there the night before, they are followed to the forests, where the elephants themselves will be found feeding or standing in the heat of the day. The European sportsman, unless mounted on a clever pony, will, however, find that the large 'guda' thorn-trees with an undergrowth of pointed aloes are a serious difficulty, when attention has to be given to the sport. The most successful mode of hunting elephants in Somaliland is, however, for the sportsman and his gun-bearers, on foot, to co-operate with about a dozen horsemen from the nearest mounted tribe.

"Assuming the right season to have been chosen (any months will do except the dry 'jilal' season), a camp should be established at a spot nearly equidistant from two or three forests where elephants are known to occur. The twelve horsemen may be sent out in parties of four in three directions to search watering-places for fresh elephant-tracks; when these are found two of the party follow them, while the

other two gallop back to camp. By fast travelling, the watering-place where the tracks were found may be reached in two or three hours, and if followed up quickly (great caution being unnecessary), the jungle where the herd is feeding may be reached in the afternoon. The tracks are easy to follow, as the path of the herd is marked by pieces of chewed aloe, with the saliva still wet upon them, or by upturned thorn-trees, or by broken branches which the elephants have thrown aside as they went. At last a crash in the forest 100 or 200 yards distant, or the loud 'swish' of a mass of creepers pulled down by a feeding elephant, or, perhaps, a sudden squeal or the rumbling sounds emitted by elephants when feeding, may be heard; or the elephants themselves may be seen standing at rest, grouped in the shade of a clump of 'guda' trees. When first sighted, the herd will probably be from 100 to 150 yards away; the approach depends chiefly on the direction of the wind, for it is mainly on their smell that elephants rely in presence of danger. The greatest difficulty is to pick out the largest bull, without alarming the other members of the herd."

The following extract from the *Illustrated Sporting and Dramatic News* for January 18, 1908, in regard to elephant-hunting on the Blue Nile will probably be of interest to sportsmen:—

"One point worthy of note is the marked difference between the elephants on the Blue and White Niles. The former have much smaller tusks, and are much fiercer, although the distance between the two rivers does not average more than 120 miles.

"At Roseires an elephant-hunt can be arranged, and if one wants a rest from shooting, fair sport with a rod and spinner, or live bait, can be had. There are certain professional elephant-hunters, and as it is a very novel and exciting kind of sport, it is quite worth the few extra pounds in 'backsheesh' necessary. The *modus operandi* is roughly as follows:—When the herd is located, a desirable bull (or, if to capture a young one, a cow) is picked out. Then one man on horseback puts himself in position to be winded, and when the elephant charges dashes off. Meanwhile all the participators and two natives mounted on the same pony give chase. The two latter eventually draw up level with the elephant, and in a second the man behind draws his sword from its scabbard, jumps off, and hamstrings the elephant. There are many varied elements of risk involved, not the least being that the whole herd, instead of a single elephant, may charge down."

In connection with what has been stated above with regard to the root-digging propensities of the African elephant, it may be well to add that, according to Sir Samuel Baker, such a habit is well known to the

natives of the Egyptian Sudan. The right tusk is almost invariably employed for this purpose, and is consequently termed by the Sudanis the *hadam*, or slave.

Remarkable abnormalities are occasionally exhibited by African elephant-tusks. Examples of these are exhibited in the British Museum, where two specimens are twisted into a corkscrew-like shape, while a third is perfectly straight.

In 1907 Colonel Sir Hayes Sadler, Commissioner of East Africa, sent to the Museum from Mombasa a still more remarkable malformed tusk. The tusk itself was evidently quite a small one, but has been almost completely buried in a huge nodular mass of ivory, so that the whole specimen may be compared to a huge yellow mangold-wurzel in general appearance. Although only some 18 inches in length, it weighs 17 lb., and would be much heavier were it not that much of the interior is hollow. At each extremity are seen portions of the tusk itself; and it would seem probable that the larger end was the one inserted in the jaw, the basal portion having apparently been broken off, and the fractured surface polished by handling or otherwise. That this extraordinary growth is the result of injury or disease is perfectly evident; but how the specimen could have grown to its present size is a mystery, for its weight is so great in proportion to the size of the shaft, or tusk proper, that it is difficult to understand why it was not broken off long before it attained such huge dimensions. Whether it was actually removed from a slain elephant or picked up was not stated by the donor.

At a meeting of the Zoological Society of London held on November 14, 1905, the Hon. Walter Rothschild exhibited two tusks obtained by Baron Maurice de Rothschild in Abyssinia, which were then regarded as so unlike normal tusks of any known animal as to suggest the possibility of their belonging to some unknown creature. Of one of these tusks Mr. Rothschild subsequently presented a cast to the British Museum. This cast indicates a highly curved and much flattened tusk of about 2 feet in length, marked on the broad concave surface by a number of bold longitudinal flutings. In 1907 Mr. L. D. Gosling presented to the Museum three small tusks of female elephants obtained during the Alexander-Gosling expedition from Lake Tchad to the Congo, one of which presents a most striking resemblance to the cast. It is, indeed, considerably smaller and less sharply curved, but is of the same general contour, and likewise bears distinct traces of longitudinal flutings on the flattened concave surface, although these are less numerous than in the original specimen, and

have been to a considerable extent obliterated by wear. A third specimen of the same general type is preserved in the Berlin Museum.

The Abyssinian and the British Museum specimens have been described in the *Archives de Zoologie Experimentale et Générale* for 1907 by Baron de Rothschild and Mr. H. Neuville, who regard the former as probably belonging to some unknown animal. All three specimens show, however, the characteristic structure of ivory, and, in my opinion, are abnormal cow-elephant tusks.

Elephants present a structural peculiarity apparently unknown in any other warm-blooded quadruped—to wit, the absence of a membranous bag, or *pleurum*, investing the lungs, which are consequently in contact with the walls of the chest-cavity. This absence of the lung-bag was first observed in the Indian species; and the same deficiency appeared to characterise an individual of the African elephant which died in Paris, although this could not be ascertained with absolute certainty. The subject was, however, mentioned in the *Field*, and in December 1907 Mr. S. A. Barns wrote to that journal as follows:—

"Some time ago I noticed in the *Field* a request to African big-game hunters to note whether the lungs of the elephant are enclosed in a bag of any kind or not. I have lately shot three bull elephants in north-east Rhodesia, and, having carefully looked at the lungs of each, can state positively that, apart from the diaphragm, the lungs are enclosed in no kind of skin, but are held in place beneath the vertebræ by strong tissues. Two long lobes run on each side of the back-bone and directly beneath it, the larger part falling in its usual place."

This settles the question.

THE BLACK RHINOCEROS

(*Rhinoceros bicornis*)

Zwaart Rhenoster, CAPE DUTCH; *Upejana*, ZULU AND MATABILI; *'Sipejana*, SWAZI AND MATONGA; *Borele* AND *Keitloa*, BECHUANA; *Upelepi*, BASUTO; *Chipambiri*, ON THE LOWER ZAMBESI; *Munyi*, NDOROBO; *Faru*, SWAHILI; *Wiyil*, SOMALI; *Aurarisse*, ABYSSINIAN.

(PLATE i, fig. 1)

Rhinoceroses, the horse tribe, and tapirs are the sole existing representatives of a group of hoofed, or ungulate, mammals known as

the Perissodactyla ("odd-hoofed"): so named from the fact that in each foot the toe corresponding to the middle finger or toe of the human hand or foot is symmetrical in itself and larger than any of the others. In the case of the horse tribe this toe alone exists in a functional condition.

Bulky, big-headed, and short-limbed animals, rhinoceroses have three toes to each foot, and one or two horns in the middle line of the head. Such horns consist of a solid mass of closely packed vertical fibres, with a slight hollow at the base, resting upon a corresponding prominence on the bones of the skull, from which it can readily be detached with a knife. Teeth, of a characteristic type, may or may not be present in the front of the jaws; but seven pairs of cheek-teeth are constantly developed, and have a distinctive and easily recognised pattern, their crowns being comparatively low and broad, with two bold transverse crests springing from an outer wall, and between them an open valley. The large and massive head has a concave profile, with the somewhat tubular ears set far back, and the eyes small; while the upper lip is generally pointed and prehensile. Each toe bears a hoof-like nail of great breadth. The tail is thin and of medium length, with a small terminal tuft; and the skin, which may be divided into several partially distinct shields by deep folds, is of great thickness, and either nearly naked, or more or less sparsely covered with coarse hair.

At the present day the group is restricted to Africa and the warmer parts of Asia, although in former times it was represented in Europe and North America.

The two African species, which are two-horned, differ from their Asiatic relatives by the absence of front teeth, and of distinct foldings in their skin.

The keitloa, or black species, is characterised by its sharply pointed and prehensile upper lip, the rounded tip of the nasal bones of the skull, and the comparative lowness and simple structure of the crowns of the upper cheek-teeth, which, in correlation with bough-eating habits, wear into a ridged surface. The nostrils are small and rounded, and the eye is situated behind the line of the axis of the second horn. In height bulls stand from about 5 feet 6 to 5 feet 8 inches at the shoulder. Great variation occurs in the proportionate lengths of the two horns, although the front one, especially in cows, is generally the longer. The second horn is always more or less compressed and dagger-shaped. In bulls the front horn, which may exceed 40 inches in length, is comparatively stout, although not with a very broad and

squared base; in cows it is more slender and generally larger, not unfrequently curving backwards in scimitar fashion. It was on slender horns of this latter type from East Africa that the so-called Holmwood's rhinoceros was named.

The range of the black rhinoceros formerly extended from the Cape to Somaliland, Abyssinia, and the Sudan, and thence to the drier parts of Central and West Africa.

That several local races of the species must exist is practically certain, but hitherto only the Somali form, *R. bicornis somaliensis*, has been named, and even this has not been well defined. The name *R. b. holmwoodi* is, however, available for the East African animal.

The following notes on this species in South-East Africa are condensed from material supplied by Mr. F. Vaughan Kirby:—

"Although naturally timid, and certainly not dangerously aggressive, the black rhinoceros is of uncertain temper, and when wounded and encountered at close quarters will charge fiercely, while occasionally it is as vindictive as a buffalo. It has three characteristic cries: a succession of deep grunts, uttered apparently by the male alone and at certain seasons; a loud snort, sounded when the animal is about to charge or when suddenly alarmed; and the shrill squeal of a moribund individual.

"Some years ago keitloas were far more numerous in Central South Africa than at the present day. In 1900 there were probably not a dozen remaining even in the most remote parts of the north-east Transvaal, where once they abounded, and only two or three in the Matamiri bush, and a few in the Libombo range near Oliphant's River Poort. In the broken country south of the Zambesi and east of the Victoria Falls, and in parts of the Barue and Chiringoma districts of Portuguese East Africa, they were, however, still fairly numerous, and there were a few in Matabililand, Mashonaland, and Amatongaland. In 1894 they were abundant in Portuguese Northern Zambesia, south-east of Tete, and in 1896 common in the interior of Mozambique.

"The black rhinoceros lies up during the heat of the day in dense patches of scrub or grass-jungle, or under the shade of a solitary bush or tree in the open, though it may often be found out in the open, unsheltered from the sun's burning rays. In hot weather these animals move towards their watering-places, often far distant, at sunset, drinking between 6 and 8 P.M.; and at such times they make a maze of tracks in the sand as they wander from pool to pool. After drinking, they set out in a straight line for their feeding-grounds, where

they browse throughout the night: making full allowance for this, it is difficult to know how they support their huge bulk on the poor food afforded in many localities by the sparse scrubby bush. In cold weather, and during the dry season, they often commence to feed immediately on waking, not visiting the water till midnight or later, this being their only drink for the day; but in hot weather they pay a second visit to the water at dawn, when, if a mud-hole is to be found, they also wallow, a process essential to such tick-infested creatures. After this they seek their mid-day resting-place, seldom moving much after 9 or 10 A.M., except in the wet season, when they may be seen browsing throughout the day. They feed entirely upon the astringent leaves of various shrubs and bushes, roots, and the leaves and twigs of the thorny acacias; and when eating, they make a loud champing noise with their jaws. Rhinoceroses almost invariably lie with their tails to the wind, and, when disturbed, start off at a slinging trot up-wind, with their tails twisted over their backs; but, if suddenly alarmed or closely pursued, they break into a gallop with which only a good horse can keep up, and which may be maintained for a long distance. Although they usually run up-wind, yet when wounded or conscious of pursuit they pursue the opposite direction. I have seen a calf about fourteen days old on October 28, and one on November 2 about a month old, while a friend shot a cow in October accompanied by a four- or five-months-old calf. Apparently the calves are usually born at the end of the rainy season, the period of gestation being probably sixteen or eighteen months. These animals are in best condition in the autumn, when the flesh, although coarse, is well flavoured.

"These rhinoceroses are so unwary and sleep so heavily that it would be most easy to stalk them but for the fact that in South Africa they are almost invariably attended by rhinoceros-birds (*Textor erythrorhynchus*), so that great judgment and the utmost care are necessary to avoid discovery. In Central Africa they are less frequently attended by the birds; but even then they often seem singularly restive and suspicious when approached, as though they knew instinctively that danger was threatening. Probably this is owing to their acute hearing, which almost rivals their keenness of scent. Although the easiest to kill of all large game, yet, if not hit properly, they give a deal of trouble to secure. Shot through the heart or both lungs they succumb quickly, though seldom falling on the spot; but if hit only in one lung they will travel for hours, despite the flow of quantities of blood from the mouth and nostrils. The

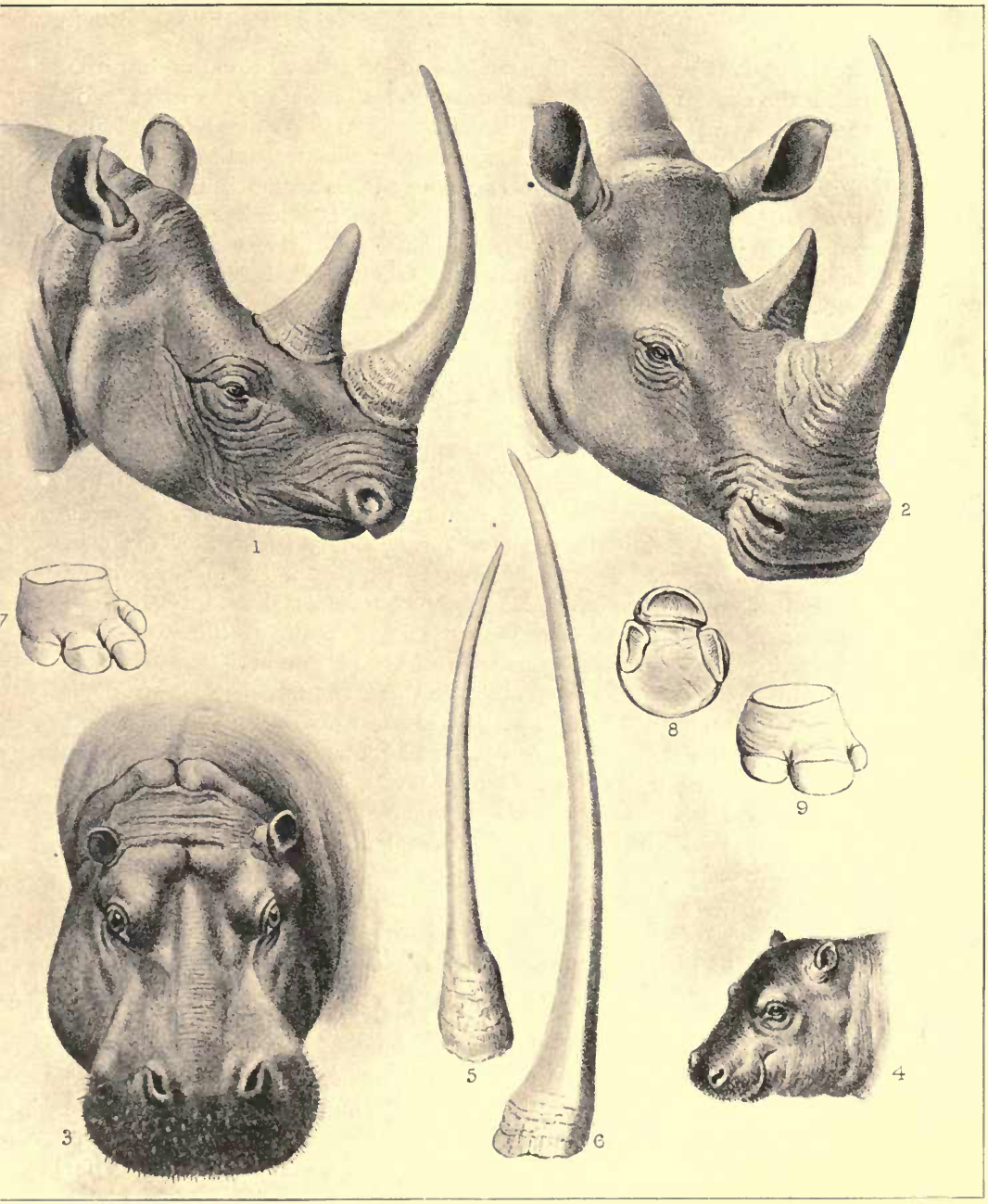


PLATE I

1. Black Rhinoceros.
2. White Rhinoceros.
3. Hippopotamus.
4. Pigmy Hippopotamus.
8, 9. Foot of Rhinoceros.
5, 6. White Rhinoceros Horns.
7. Foot of Hippopotamus.

neck-shot is the best, aim being taken about a foot behind and a little below the root of the ear; but the head-shot, 4 or 5 inches in front of the ear towards the eye, is a certainty when the animal is standing still. A mortally wounded rhinoceros will spin round and round in a circle, with its head as a pivot, and the hind-quarters jerking up and down in extraordinary style. Usually, but not always, this action signifies impending death; but not unfrequently the creatures pull themselves together again, and make a blind forward charge, generally in the direction in which they are facing when they stop revolving. One evening I was watching a track along which a bull and cow rhinoceros with their calf used to travel to water; the ground was open, and I had made a little shelter of branches about 30 yards from the track. The beasts came just after sundown, the bull loitering behind on the forest-edge, while the cow and calf advanced, the former, when opposite, deliberately leaving the track and walking straight in my direction, till she stood sniffing loudly about 12 yards distant. I did not want to shoot her, not only because of the calf, but for fear of scaring the bull; but as she again advanced, I threw a piece of dead wood which hit her on the nose, when she became furious, snorting loudly, charging again and again at the wood, and tossing it with her horn. Meanwhile the bull came up, and, stopping where the cow had turned, watched her and her calf as they made off towards the water. I fired at his heart, when he at once started waltzing round and squealing loudly, and then suddenly he made a furious dash in my direction. Barely giving me time to scramble out of the way, he passed over the spot where I had been sitting, kicking my water-bottle as he passed; after which he stood 100 yards farther off when, swaying from side to side, he dropped dead. Of course this was a blind charge, made without any intention of injuring me, but I have been most viciously charged by them. In 1896 I twice bowled over a big bull within a few paces, but he recovered himself, and as my gun-bearer had gone off with my spare rifle, I had to run, closely pursued for a long distance by the rhinoceros, which eventually came to grief against a big boulder. If a wounded rhinoceros detects you (and their sight is very bad) at close quarters, he may be expected to charge, and often does so. It is seldom much use following these animals when wounded, as they keep going for miles until they drop. I have seen a cow, with her fore-leg broken above the knee, travel for over a mile at a pace that my gun-bearer and myself could not keep up with; while another, also with a fore-leg broken, went over 6 miles, sometimes at a great pace, before she was killed. When charging,

they are difficult to stop; and, in my opinion, heavy metal should be used, while the sportsman should either kneel or squat down in order to put a bullet in the chest or throat. The most sportsmanlike method of shooting is by 'spooring' them from their drinking-holes, when water should always be carried. Even if disturbed once or twice, they do not go far before halting; and if they are lying-up in thick covert, native attendants can be sent in at the far end to drive them out. They invariably break covert at or near the spot where they entered; and this point should be guarded by the sportsman. Following them in thick covert is exciting but somewhat unsatisfactory work, as the sportsman must get to close quarters in order to obtain a shot, and is almost certain to be heard before this can be accomplished."

Mr. A. H. Neumann, in recording his experiences in British East Africa, observes that in "East Africa the black rhinoceros seems to become smaller as we go north, an adult bull from Naivasha standing 5 feet 5 inches in height, and measuring in length 12 feet 1 inch, exclusive of the tail; while one from the Seya river stood 5 feet 3 inches, and measured 10 feet in length; and a third from Lake Rudolf stood only 4 feet 9 inches, with a length of 9 feet. In the vast majority the horns are short, under a foot in length, any over 18 inches being uncommon, while a length of 30 inches or upwards is extremely rare.

"In some places rhinoceroses are very common; so much so that one may often see many in one day, where the country is sufficiently open, while merely travelling through. They do not, like elephants, confine themselves to thick bush; nor, except where much persecuted by natives, are they careful to conceal themselves during the daytime. Moreover, though probably in the aggregate less numerous than elephants, they live scattered over the country in pairs or singly, sometimes three, and rarely four being found together, but never more; and since they keep pretty much, as a rule, to the particular area forming their own haunts, and do not migrate from one district to another, after the fashion of elephants, they are more in evidence than the latter.

"It is a mistake to suppose that rhinoceroses have any tendency to sub-aquatic habits. A wet climate disagrees with them, and during the rains they are always in poor condition, and generally have sores on their bodies. This appears to be the reason that there are so few rhinoceroses in West Central Africa, and that they are scarce in those parts of East Africa where the rainfall is greatest. The dry barren

wastes of British East Africa seem to suit them best; and there they are equally at home in the dense scrub, such as that which borders the Tana river, where they are very numerous, and in the open arid plains of Masailand or Laikipia. They are also sometimes met with in the forests, on the slopes of the principal mountains and ranges. On the other hand, in Uganda, Usoga, and Kavirondo, bordering the Victoria Nyanza, where the climate is moister, there are, so far as I am aware, no rhinoceroses; and they are also absent from the neighbourhood of the sea-coast. As rhinoceroses must drink nightly or

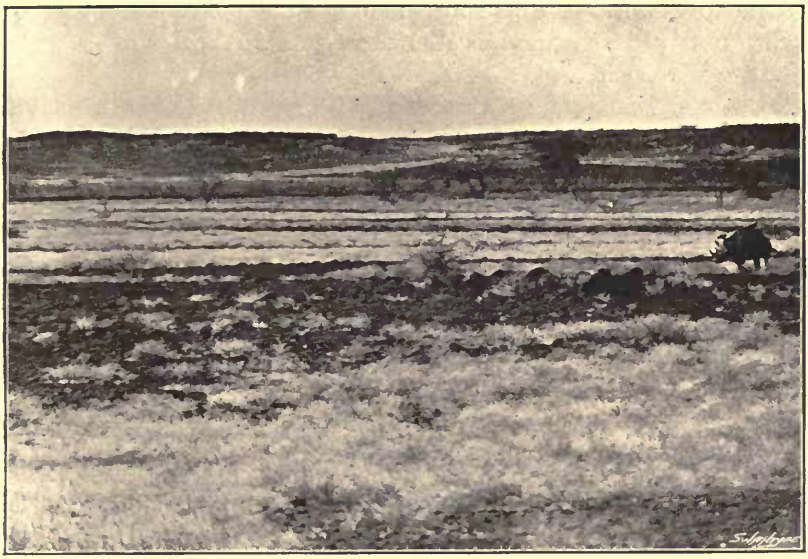


FIG. 10.—Black Rhinoceros photographed by Lord Delamere in the country to the east of Lake Rudolf.

daily (I have many times watched one drink in broad daylight), they are never seen any very great distance from water; and the sight of one of these animals is a sign that water is to be found somewhere within a distance of not more than some 8 or 10 miles. As rolling in the dust is a favourite habit, these animals generally approximate in colour to the soil of the country they inhabit; so that in one district they appear almost white, and in another red or nearly black, as the case may be.

"Rhinoceroses wander and feed all night, and, where not much disturbed, during a good part of the day, although during the hottest

hours they commonly sleep, sometimes under a tree, at other times in the open. Where much harassed by natives they are, however, seldom or never seen abroad by daylight, hiding themselves in the densest thickets, so that only the spoor made during their nightly rambles betrays the fact of their presence.

"Although the black rhinoceros does not eat grass, in open country its food consists to a great extent of plants that grow among the grass on the plains, and it may thus be seen apparently grazing. During periods of drought these animals wander far over the uplands in search of food, coming down during the night to slake their thirst at some pool left in the bed of a watercourse many miles distant, to which their well-worn paths converge. As has often been pointed out, they are intensely stupid, and marvellously blind, so that they may often be approached even on a bare plain with little trouble, up-wind. It is this stupidity and blindness which make them a source of danger to passing caravans; for, should the wind be blowing from them, when unaccompanied by rhinoceros-birds, they frequently remain unconscious of the approach of a caravan until it is close to them, when, being suddenly confronted with a long line of porters, they will sometimes charge straight through, apparently under the impression that there is no other way of escape. On the other hand, they are very keen-scented, and if the wind be blowing in their direction they start off at a quick trot as soon as the taint reaches them. It is only when wounded that a rhinoceros gallops.

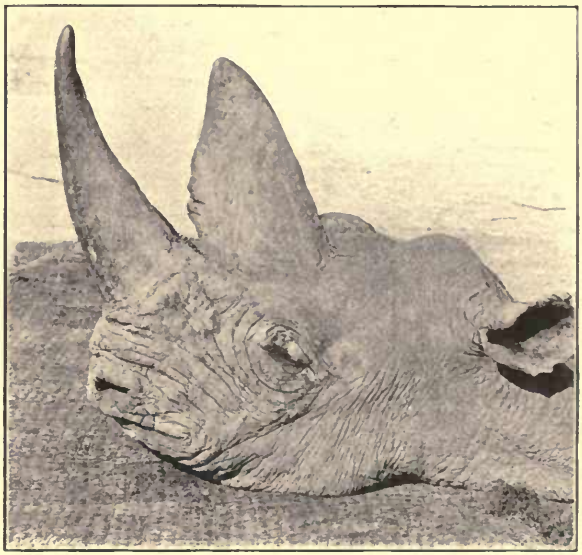


FIG. 11.—Head of Black Rhinoceros shot to the east of Mount Rutal, photographed by Lord Delamere.

"As the result of my experience, under ordinary circumstances and with proper caution, there is not very much risk in shooting

rhinoceroses, the danger not being comparable in any way with that attending the pursuit of the elephant. At the same time, there is always a possibility that one may charge, and there is accordingly a certain amount of excitement in the sport; instances not being rare of men having been badly injured by these beasts. If a rhinoceros charge home, he is generally not difficult to dodge, and when dodged he commonly goes right on. When suddenly disturbed, in his first rush he makes a great puffing and snorting, particularly disconcerting in thick covert when the beast is hidden and it is impossible to tell which way he is coming.

"The Ndorobo, who kill them with their large assegais, or trap

FIG. 12.—A Black Rhinoceros in jungle, from a photograph by Mr. Norman B. Smith.

them in the same manner as elephants, have far less fear of rhinoceroses than of elephants; and as a consequence it is rare to see a rhinoceros in country much frequented by tribes of these people, who have much skill and courage in elephant-hunting. The same remark applies to Swahilis, many of whom think nothing of shooting a 'faro,' though they would not dream of attacking an elephant. The Wasanya, who stand in the same relationship to the Galas as the Ndorobo do to the Masai, used to kill both rhinoceroses and elephants with their powerful bows and arrows; while, owing to the aid of poison, the puny weapons of the Wakamba are occasionally capable of making one of these monsters bite the dust."

According to Mr. A. H. Straker, the black rhinoceros in Somaliland is subject to considerable variation in the matter both of bodily size

and the length and number of its horns. One specimen killed by this gentleman had three horns; in another the length of the front horn was 29 and that of the back horn 12 inches; while in a third these two dimensions were respectively 17 and 18 inches. Some years ago rhinoceroses were still fairly numerous on the south side of the Haud, especially between Milmil and Imi, and also south of the Webbe Shebeley. In Somaliland these animals have a great partiality for the giant euphorbias (commonly miscalled cactuses), which they uproot, and then chew the stems. Their hides are much prized by the Somalis for shields, from fifteen to twenty of which can be cut from a single skin.

Rhinoceroses with three, or even more, horns have been killed in other parts of East Africa.

THE WHITE OR BURCHELL'S RHINOCEROS

(*Rhinoceros simus*)

Wit Rhenoster, CAPE DUTCH; *Chukuru*, BECHUANA; *Umhofo*, MATABILI

(PLATE i, fig. 2)

The third largest of living land animals, being exceeded in this respect only by the African and the Indian elephant, the white rhinoceros was long supposed to be confined to Africa south of the Zambesi, where it is now on the point of extermination, if indeed it has not already ceased to exist. A few years ago a skull of this species was, however, brought by Major A. Gibbons from the Lado enclave, about five degrees north of the equator, where the animal is now known to exist in small numbers, although nowhere abundant.

Why it was called white rhinoceros by the Boers (unless indeed its representatives in the old days were really paler in some districts than the black rhinoceros) remains a mystery. Nevertheless, this is the most convenient and best-known designation for this mighty animal.

Attaining a shoulder-height of from 6 feet 6 inches to 6 feet 8 inches, the white rhinoceros is distinguishable at a glance from the other African species by its broad, abruptly truncated muzzle, which is non-prehensile; correlated with which is the squared extremity of the nasal bones of the skull. The front horn of the male has a remarkably

broad and squared base; while the second horn lacks the compressed form so often seen in the black species. The horns of cows are longer and more slender, the record length of the front one being $62\frac{1}{2}$ inches. The nostril is larger and more slit-like than in the black species; the situation of the eye is well behind the line of the axis of the second horn; and the ear is taller, more tubular, and more pointed at the tip. The crowns of the upper cheek-teeth, as compared with those of the black rhinoceros, are taller and show a more complicated pattern on their grinding surfaces, which are horizontal throughout, in place of ridged, thus admitting of a mill-like, in place of a champing, action. This is in correlation with the grazing habit, distinctive of the present species.

FIG. 13.—Single-horned White Rhinoceros, from the photograph referred to in the text.

In walking, the head is carried low, in consequence of which the tips of such horns as curve forwards are worn to a smooth facet in consequence of being pushed along the ground. The second horn is generally a good deal smaller than the front one, and may be reduced to a mere boss, or even, as in the undermentioned instance, practically absent.

Among a collection of, mostly anthropological, photographs made in 1870 by Mr. Ernest Héritte, Consul-General of France at the Cape of Good Hope, and presented in 1906 by Colonel A. G. Anson to the British Museum (Natural History), is one of a freshly killed white rhinoceros, which is of interest from two points of view. In the first place, it is the only photograph of an entire specimen of the South

African race of this species, with a really fine front horn, which has ever come under my observation. Indeed, the only other photographs I know are two (of a single individual) published in the Zoological Society's *Proceedings* for 1903, pp. 233 and 234. In the second place, the photograph here reproduced (fig. 13) is remarkable as representing a specimen with practically only a single horn. In the original album the photograph is labelled *Rhinocéros à une corne*, and although examination with a lens reveals the presence of a minute tubercle representing a second horn, the description is practically correct. The single (front) horn is about a yard in length. At least two of the older writers on African natural history refer to a native belief in the existence of single-horned rhinoceroses. In 1838 Sir Andrew Smith, for instance, in his *Illustrations of the Zoology of South Africa* (vol. i., description of plate i.), alludes to the existence of such a belief; but it is somewhat difficult to determine whether the accounts referred to are founded on fact or are of purely fictitious origin. Again, in 1848, a French writer, Mr. F. Fresnel, contributed a paper to the *Comptes Rendus* of the Paris Academy of Sciences (vol. xxvi. p. 281) entitled "Sur l'existence d'une espèce unicorne de rhinocéros dans la partie tropicale de l'Afrique." The reports alluded to in this communication relate to the Lake Tchad district and the White Nile, but there is the same difficulty as in the last in deciding as to what value should be attached to them. If based on fact, they may refer to the northern race of the white rhinoceros, of which, as pointed out by Sir Andrew Smith in the work cited, two horns, now in the British Museum, were brought from the neighbourhood of Lake Tchad by Messrs. Denham and Clapperton in the first quarter of last century.

In regard to the variation in the length of the posterior horn in specimens of the white rhinoceros which came under his own observation, Mr. F. C. Selous states in the account reproduced below that this appendage may range from a horn of a couple of feet in length to a mere hump two or three inches high. The animal represented in Mr. Héritte's photograph may accordingly be regarded as representing the extreme stage in the degeneration of the second horn, and is in no wise entitled to recognition as a distinct race, still less a species.

Early in 1908 Major P. H. G. Powell-Cotton presented to the Natural History branch of the British Museum the skull and horns of a male white rhinoceros killed by himself in the Lado district. The skull indicates an immature animal, the last upper molar tooth

on each side not having yet come into use, while the last premolar has not been replaced by its permanent successor. On contrasting this specimen with skulls of the typical southern race of *Rhinoceros simus* I was somewhat surprised (considering the distance separating the haunts of the two animals) to find how comparatively slight are the differences. Of the two southern skulls used in the comparison one belongs to a male specimen in the Museum obtained some years ago by Mr. R. T. Coryndon, while the other is a specimen which has been long in the Museum, and of which the sex is unknown. They both indicate fully adult animals, having the last molar teeth in use. As the second skull differs somewhat in form from the first, it may possibly be that of a female.

As regards the teeth, there seems no difference between the southern and the northern skulls. The latter is, however, readily distinguished by the shorter and wider form of the nasal bones which support the front horn. In the skull of Mr. Coryndon's specimen these bones project 6 inches in advance of their lateral supports, and measure $7\frac{1}{4}$ inches in maximum width in front; whereas the corresponding dimensions in the Lado skull are $5\frac{1}{2}$ inches and $7\frac{3}{4}$ inches. If the second South African skull were used as the basis of comparison, the differences would be greater; but that skull, as already mentioned, may pertain to a female. It may be added that if the Lado skull were fully mature, the width across the nasal bones would probably be still greater, as a character of this nature is one which might naturally be expected to intensify with age.

The Lado white rhinoceros thus presents an exaggeration of the feature from which the species received its designation of *simus* ("snub-nosed," or "blunt-nosed"), and the difference appears sufficiently marked to admit of its being regarded as a separate local race, for which the name of *Rhinoceros simus cottoni* was proposed by myself in the *Field* newspaper for February 22, 1908 (vol. cxi. p. 319). The horns of the Museum specimen present no characters by which they can be satisfactorily distinguished from southern examples. The front one has an extremely massive basis, and curves very sharply backwards; its total length being $30\frac{1}{2}$ inches. The two horns in the Museum referred to above as having been brought from the Lake Tchad district in the early part of last century by Messrs. Denham and Clapperton, although of small size, doubtless belong to *R. simus cottoni*. I have never seen female rhinoceros horns from Equatorial Africa of the long and slender type of those upon which Gray founded the so-called *Rhinoceros oswelli*; and the absence of horns of such a

type in the female of the Lado rhinoceros may eventually prove to be another distinctive characteristic of that race.

The following excellent account of the habits and distribution of this species in South Africa is abbreviated and slightly modified from one furnished by Mr. F. C. Selous:—

"In central and eastern South Africa the white rhinoceros is unknown to the north of the Zambesi, as it is north of the 17th parallel of south latitude in the more westerly portions of the country. To the south of that line it was, however, abundant a century ago all over South Africa north of the Orange river, except in waterless or mountainous districts. In 1812 Dr. W. B. Burchell first met with this species in the Batlapin district not far from the present mission-station of Kuruman. Probably its range once extended even farther south, although I doubt whether it was ever an inhabitant of the country lying immediately north or south of the Orange river below its junction with the Vaal, as those districts are very arid and produce little grass. At any rate, all the rhinoceroses met with south of the Orange river by the earlier South African travellers, including Burchell, seem to have been of the black species. Whether the Boers when they first entered the country now known as the Orange River Colony, in 1836, met with the white rhinoceros is not definitely known, although they probably did, as I have had places pointed out to me north of the Vaal river, on the open grassy plains of the southern Transvaal, where specimens were seen by the early Dutch pioneers; and as the pasture to the south is good, and the Vaal river fordable at many points during the dry season, there is no reason why some individuals should not have crossed at certain times of the year. In the north-west of the Transvaal the white rhinoceros was very abundant, Sir Cornwallis Harris mentioning that on one occasion in 1836, as he was travelling through the Magaliesberg district, eighty were seen during the day's march, while on his way from the Limpopo to a hill half a mile distant no fewer than twenty-two were counted, of which, in self-defence, four were killed. Harris also mentions that Sir Andrew Smith, when travelling about the same time through the country some two degrees north of Magaliesberg, encountered during a single day's march with his bullock-waggons, without wandering any great distance on either side of the track, between 100 and 150 rhinoceroses, half of which were probably of the present species. Between 1840 and 1850 travellers report having found the white rhinoceros abundant wherever there was water to the north and west of the Limpopo between Secheli's country and Lake Ngami. Gordon Cumming saw great

numbers, and mentions having observed on one occasion upwards of a dozen on a patch of young grass, though he speaks of such a sight as being unusual.

"During one short hunting-trip in 1847 or 1848 Messrs. Oswell and Vardon are credited with having killed no less than eighty-nine rhinoceroses, the majority of which were probably of this species. During his travels between 1850 and 1854 Mr. C. J. Andersson also found these rhinoceroses very numerous in the district lying west and north-west of Lake Ngami, and writes of having killed nearly sixty head of this species during one season. He also mentions the fact of nine of these animals having been killed in one day by a single European near Walfish Bay.

"In 1871, the date of my first visit to South Africa, the range of the white rhinoceros had been much reduced, but these animals were still numerous in the uninhabited districts of Matabililand, Mashonaland, Gazaland, and Zululand, as well as in some portions of the eastern and south-eastern Transvaal. In August 1872 I first saw its fresh tracks near Mangwe, about 60 miles south-west of Bulawayo, and a month later met with the white rhinoceros farther to the north-west. At that time it was still numerous in this part of the country; and while elephant-hunting during the last three months of the year between the Gwelo and Umniati rivers I saw white rhinoceroses almost daily, sometimes as many as six or eight in one day. In 1873 I found them abundant to the south of the mountainous tract of country extending eastwards from the Victoria Falls to the junction of the Gwai and Tchangani rivers. In the following year, when hunting on the south bank of the Chobi, white rhinoceroses were not uncommon; but in 1877, during several months spent in the same district, only the tracks of two were seen; while in 1879, during eight months' hunting on and between the Botlitli, Mababi, Machabi, Sunta, and upper Chobi rivers, not even the spoor was seen, and the bushmen said there were no white rhinoceroses left. In July 1884, however, while I was camped near the reed-bed in which the Mababi river loses itself, some natives came on a white rhinoceros crossing the foot-path on its way back from the pool where it had been drinking. From the fact that it came to drink in the middle of the day, this animal must have been very thirsty, and had probably come from some 'vley' in the desert-country to the south which had recently dried up. Although I followed its tracks for a long way, I never either heard or saw anything of it; and it probably went down the Tamalakan towards the Botlitli. This is the last white rhinoceros of which I heard in western South Africa.

"In the country to the north-east of Matabililand, between the Sebakwe and the Manyami rivers, white rhinoceroses were still fairly numerous in 1878, when I once saw five together; and it was not till after 1880 that their numbers were seriously reduced. About that time rhinoceros-horns—of all sorts and sizes—increased in value; and as ivory was scarce in South Africa, the traders in Matabililand employed natives to shoot rhinoceroses for the sake of their horns and hides.

"One trader alone supplied 400 Matabili native hunters with guns and ammunition, and between 1880 and 1884 his store always contained piles of rhinoceros-horns, although they were constantly being sold to other traders and carried south to Kimberley on their way to England. What caused this demand for rhinoceros-horn from 1880 to 1885 I am unaware; but whatever it may have been, it sounded the death-knell of white and black rhinoceros alike in all the country that came within reach of these Matabili hunters. The Manyami river was, however, looked upon as the boundary of Lo Bengula's dominions to the north-east, so that none of his people dared hunt in small parties much to the east of the lower Umfuli river, and it thus came to pass that the white rhinoceroses inhabiting a small tract of country between the Angwa and the Manyami, though they were occasionally killed by the natives of the surrounding districts, were not systematically slaughtered like their brethren to the west of the Umfuli river. In 1886 two Boer hunters, Karl Weyand and Jan Engelbrecht, shot ten white rhinoceroses in this tract, while five more were killed the same year by some Fingo hunters resident in Matabililand. A few escaped, of which in the following year I saw the tracks of two or three, but did not come across any of the animals themselves, though one of my waggon-drivers shot a big bull.

"When on my way from Matabililand to the Manyami river in 1882, I shot a bull and a cow, letting their calf go. Neither had good horns, but I kept the skull and head-skin of the bull, which are now in the South African Museum at Cape Town. These were the last white rhinoceroses I saw alive.

"In August 1892 Messrs. R. T. Coryndon and A. Eyre, when about 100 miles north-west of Salisbury, came suddenly on a family of white rhinoceroses, bull, cow, and calf. The two former, although wounded, escaped, but the calf was killed by a stray bullet. While following the wounded animals the next day Messrs. Coryndon and Eyre came on a cow, accompanied by a half-grown and a very young calf. The cow was shot and the small calf captured alive; but it was

found impossible to transport the skin and skeleton of the cow. In 1893 Mr. Coryndon, in the same part of the country, was fortunate enough to come upon two bulls, which he shot, and preserved the skins and skeletons of both. One of these specimens is in the British Museum (Natural History), and the other in the Tring Museum. In 1895 Mr. Eyre obtained another bull in the same part of Mashonaland, which was bought by Mr. Cecil Rhodes and presented to the South African Museum at Cape Town.

"Although it was known that a few white rhinoceroses survived in northern Mashonaland, it was generally believed that by 1890 the species had become extinct in every other part of South Africa. In 1894 a few of these animals were, however, discovered in a corner of Zululand, of which six are said to have been shot during that year. The skin and skeleton of one of these, a bull, are in the Museum at Pretoria. In 1899 a few still survived in one small district of Zululand, whilst perhaps a dozen others were scattered over the Mahobohobo forests between the Angwa and Manyami rivers in north-eastern Mashonaland.

"In habits white rhinoceroses are of a rather sluggish disposition, spending the greater part of the day sleeping in some shady place, either standing, or more usually lying down, in which latter position they look like enormous pigs. In the afternoon, as the sun gets low, they wake up and commence to feed towards the water; and I have so often seen them drinking at sunset, both during the cool season and in the hot weather which precedes the rainy season, that I fancy it was their usual habit to drink before dark, when they had no reason to fear attack. In south-western Africa, where there are few running rivers, all the rhinoceroses, which during the rains were scattered over an enormous area, collected towards the end of the dry season round the few permanent springs, and they probably learned that it was unsafe to drink until after dark.

"Of all animals, except, perhaps, the elephant, the white rhinoceros was the easiest to approach unobserved, if the wind was favourable, and there were no rhinoceros-birds present to give warning of danger. Apart from any obstruction caused by the position of the horns, his vision was bad; and I remember to have walked to within 30 or 40 yards of white rhinoceroses upon several occasions without attracting their attention, although apparently in full view. They seemed, however, quick of hearing, as the breaking of a small twig or any other slight noise immediately attracted their attention; and their sense of smell was also acute. When accompanied by rhinoceros-birds, they

could not be approached closely, as the birds always gave the alarm by screeching and running about their heads in an agitated manner. When white rhinoceroses got the wind of a human being, even if several hundred yards distant, they always decamped. They start off at a trot, which is so swift that I never saw a man on foot able to keep up with one. If pursued on horseback, they break from their trot into a gallop, and maintain for a considerable distance a speed perfectly astonishing in animals of their huge size and ungainly appearance. A white rhinoceros was easier to shoot from horseback than one of the black species, as the latter animal is not only swifter, but has the habit of constantly swerving as one ranges alongside, and never offering anything but its hind-quarters, whereas one could gallop a little wide of and in front of a white rhinoceros, and thus get a good chance of shooting it through the lungs or heart as it came broadside past.

"A shot through the upper part of the heart of a white rhinoceros was soon fatal; while, as the lungs are remarkably large, one shot through both lungs also usually succumbed quickly. If, however, wounded in one lung, or shot too far back, it was little use following a white rhinoceros, as I found that if it did not succumb to its wounds within a short distance, it was likely to travel many miles before dying or coming to a halt. With a broken hind-leg, neither white nor black rhinoceroses can run; but I have seen one of each species travel a mile with a broken shoulder, going off first at a gallop on the three sound legs, and then slowing down to a halting kind of trot.

"When feeding, white rhinoceroses hold their mouths near the ground, as they eat nothing but grass, which at certain seasons of the year is very short. They also hold their heads low at all other times; and whether walking, trotting, or galloping, the great square nose was always close to the ground, and if the animal carried a straight horn over $2\frac{1}{2}$ feet in length, or one slightly bent forward, as is sometimes the case, the point got worn flat in front by constant contact with the ground. The calf always walked in front of its mother, who apparently guided it with the point of her horn, which seemed to rest on the calf's hind-quarters, as was observed by Gordon Cumming, who gave a good illustration of this mode of procedure in his work on South African hunting. As already mentioned, the white rhinoceros was sluggish; while as a general rule it was the reverse of vicious, as the small number of accidents which occurred during the extermination of this once numerous species in South Africa sufficiently proves. It is true that Oswell had one of his horses transfixed by the horn of one of these animals, while an elephant-hunter was severely injured by

a white rhinoceros in Mashonaland about forty years ago. These, however, are but exceptions to the rule that, speaking generally, the white rhinoceros was a harmless and inoffensive animal.

"The individual differences between white rhinoceroses are very great, the front horns of bulls measuring from 18 to 40 inches in length, and those of cows from 24 to 60 inches, or even more. As a rule, the front horn curves slightly backwards, but is often straight and sometimes bent slightly forwards, and sometimes strongly curved backwards. The second horn varies from a mere hump 3 or 4 inches in height to a couple of feet in length. The longest horn known is in the possession of Colonel W. Gordon Cumming, and measures $62\frac{1}{2}$ inches in length over the curve; it was brought from South Africa by the great hunter Roualeyn Gordon Cumming. The next longest, which is in the British Museum, is also that of a cow, and measures $56\frac{1}{2}$ inches over the curve. Another horn brought home by Gordon Cumming measures $52\frac{1}{2}$ inches; it is figured, in company with the record specimen, in the illustration on page 45. In South Africa I have seen two very long horns, one measuring 54 and the other 52 inches; and in 1872 I shot a cow with a horn which was strongly bent backwards, and measured 45 inches over the curve. About the same time three other cows were shot by Griqua hunters close to my camp with horns over 3 feet in length; and in July 1880 one of my waggon-drivers shot a bull of which the front horn measured $37\frac{3}{8}$ inches in length, with a circumference of over 27 inches, and the second horn $17\frac{7}{8}$ inches. The skull and horns are in my own collection.

"The flesh of the white rhinoceros was considered by Dutch and English hunters to be superior to that of any other game animal in South Africa; the part in greatest favour being the hump, situated in front of the withers. This was cut off whole and roasted in the skin in a hole dug in the ground. Towards the end of the rainy season, in February and March, white rhinoceroses became excessively fat, and would often remain in good condition till late in the dry season. I have seen them so fat that between the skin and the flesh over the greater part of the body there was a layer over 1 inch in thickness, while the whole belly was covered with fat 2 inches thick. The fat was soft and oily, well flavoured, and excellent for culinary purposes.

"The species was apparently a slow breeder, for although I have often seen cows accompanied by calves at least three-quarters as large as themselves, and probably several years old, very few of these had a second calf with them. Once I saw a cow with two three-parts-grown

calves, both about the same size, and presumably twins; such, I

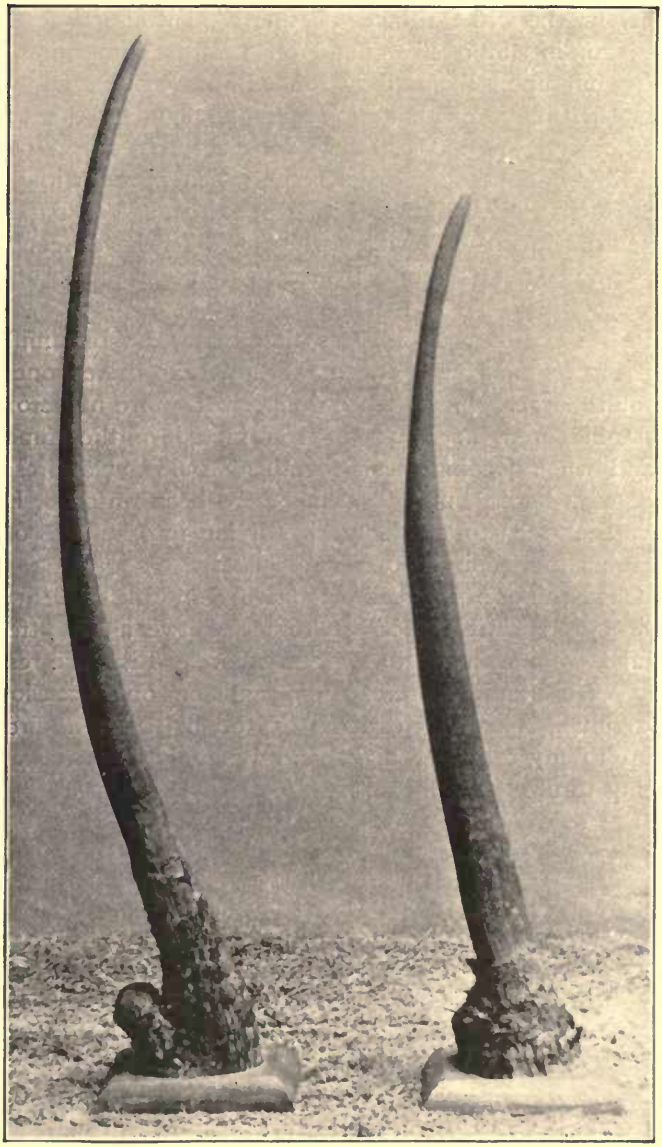


FIG. 14.—Front Horns of Female White Rhinoceros, brought home by Gordon Cumming.

imagine, were very rare. Small calves were almost impossible to drive

away from their mother's carcase, and would charge most viciously at anything that approached, just as will a very young elephant.

"In colour the white rhinoceros was a neutral grey. It is true that when standing in open ground on a winter's morning, with the sun shining full upon them, they looked very white; and since the Boers must first have encountered these animals on the open grass plains in the neighbourhood of the Vaal river, this may have induced them to bestow upon the species a name which appears inappropriate. Cornwallis Harris refers to the white rhinoceros as varying in colour, but being usually dirty brownish white. All I have seen appeared about the same colour—a uniform grey, with no suspicion of brown or white.

"White rhinoceroses usually associated in pairs or families, a bull and cow living together with one or perhaps two calves, one of which would be quite large. When these rhinoceroses were numerous, several pairs or families were, no doubt, often attracted to the same piece of pasture, and when feeding near together would have presented the appearance of a herd; but, had such a herd been watched, I expect it would have been seen to break up and divide into families of three or four on leaving the feeding-grounds.

"As these rhinoceroses feed exclusively on grass, open valleys or thin forest-country with good pasturage between the trees, as in Mashonaland, were essential to their existence. Like the rest of their kind, they were inquisitive creatures; and on one occasion a full-grown individual, evidently attracted by the light of the fires, walked straight up to my camp at night, and was only driven away by fire-brands being thrown at its head."

GRÉVY'S ZEBRA

(*Equus grevyi*)

Fer'o, SOMALI; *Kanka*, NDOROBO

(PLATE ii, fig. 4)

With Grévy's zebra of Abyssinia, Somaliland, and the Lake Rudolf district, we come to the first representative of the horse-tribe, or *Equidæ*, in which are included not only the wild horse and its domesticated relatives, but zebras and asses. Although both belong to the same suborder—the Perissodactyla—the members of the horse tribe

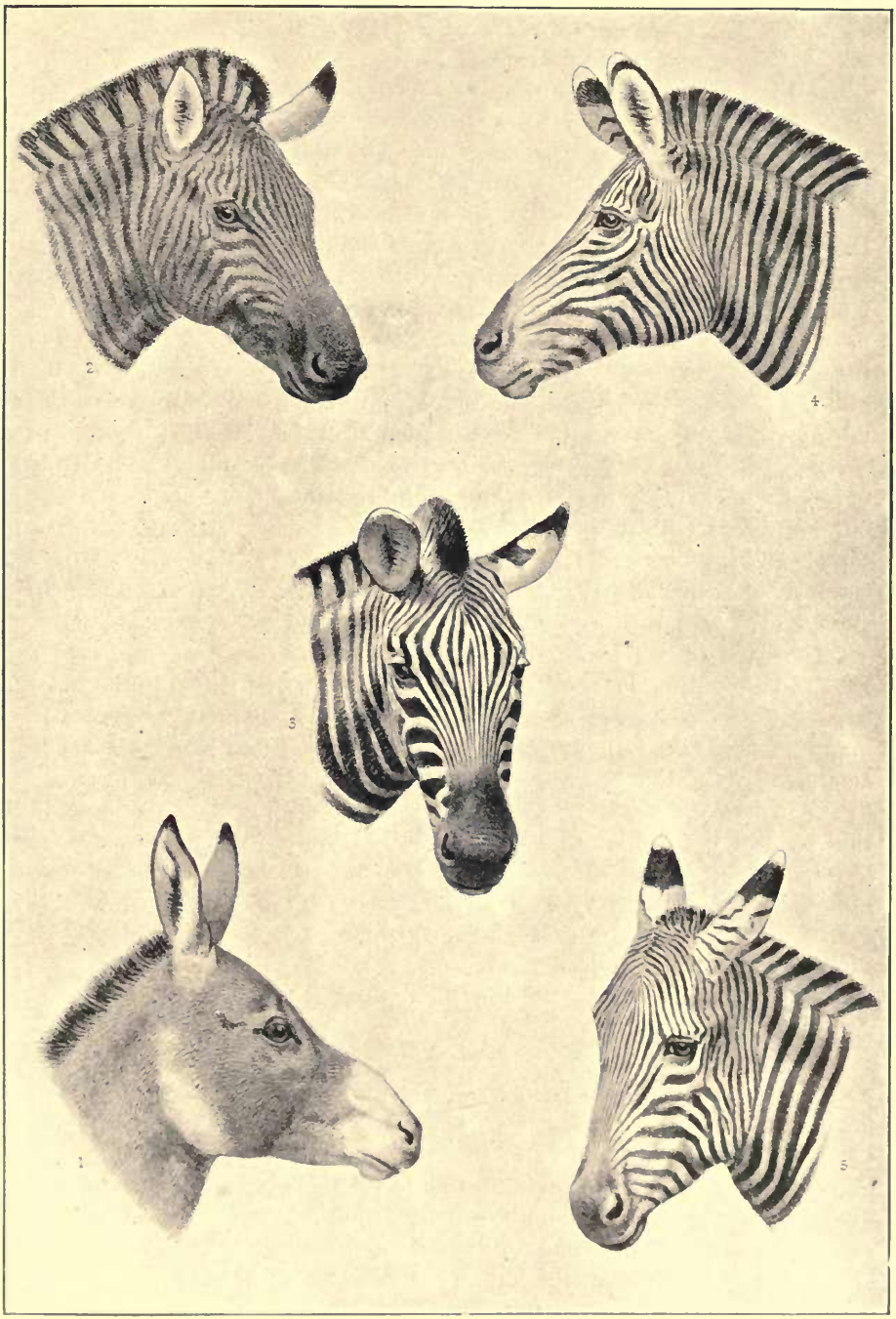


PLATE II

1. Wild Ass.
2. Quagga.
3. Bonte-Quagga.
4. Grévy's Zebra.
5. Zebra.

differ from rhinoceroses almost as much as nearly allied animals can. The horse and its relations are cut out for speed and mostly for a life on open plains, where their colouring, which is often of a comparatively brilliant type, is specially adapted to render them as nearly invisible as possible. In place of the short, thick, three-toed limbs of the rhinoceroses, their legs are long and slender, each terminating in a single toe, which is protected by a firm and rounded hoof. Incisor teeth, adapted for nipping grass, together with relatively small tusks, or canines, in those of stallions, occupy the fore-part of both jaws ; and the cheek-teeth have very tall, squared, prismatic crowns, with the hollows between the enamel-covered columns of ivory completely filled up by the substance known as cement. When worn, the crown-surfaces present a very characteristic pattern. The body is completely covered with hair ; the neck is maned ; the tail, which is long, may be either covered with long hair throughout, or tufted at the end with the same ; and peculiar hard callosities are present on the inner sides of either the fore, or both pairs of limbs. The family is now confined, in a wild state, to the Old World, the striped species being restricted to Africa.

In place of wallowing in mud, like rhinoceroses, asses and zebras are fond of rolling in sand or dust. Grévy's zebra, which is the most northerly representative of the striped group, is markedly different in many respects from both the typical zebra and the quaggas. The arrangement of the stripes on the hind-quarters is altogether unique ; the callosities on the fore-legs are as small as in the horse ; and, as in that species, the mane extends on to the withers, and the tail-tuft is large and full ; while the large, broad, and thickly haired ears are different from those of all other members of the family, which are narrow and pointed. The large size of the ears and the narrowness of the stripes appear to be adaptations to a life partially spent in thin scrub, in which, as shown in the photograph by Lord Delamere, this species is commonly found.

The colour-pattern of Grévy's zebra is as follows :—The alternate dark brown or black and light stripes on the body, head, and limbs are for the most part very narrow, widening out only on the lower jaw, the neck, and the lower part of the thigh. On the flanks none of the stripes bend backwards and upwards so as to extend on to the hind-quarters, the upper portion of which is marked with vertical stripes arranged concentrically round the root of the tail. The dorsal stripe is broad, especially near the middle of the back ; there are no transverse stripes on the under-parts, and the stripes on the nose practically stop short of the nostril-patches, the nose itself being greyish.

It will be evident from this that the stripes on the rump have their concavity directed upwards (fig. 15), whereas in the next species the convexity is upwards.

Two races, or subspecies, of Grévy's zebra have been defined, namely, the typical Abyssinian race and the Somali *E. grevyi berberensis*. In the former the stripes are black and the interspaces white, like the under-parts. In the latter the stripes are dark brown and the interspaces buff, and thus distinctly darker than the lower surface.

FIG. 15.—Grévy's Zebra.

Mr. A. H. Neumann remarks that Grévy's zebra lives chiefly in open or sparsely wooded country; and although near the Tana it is found in more bushy ground, it always avoids anything like thick bush. Mainly an animal of the arid plains, it sometimes frequents bare stony hills, but always in barren country where the grass is short. The bonte-quagga, on the other hand, may be found in all kinds of country, except dense forest and extensive scrubs where there are no open spaces and no grass. The foals are usually born in August or September, though a new-born foal has been seen in May. The number in a herd is not usually very large, ranging from about half-a-dozen to as many as twenty, or occasionally thirty.

Grévy's zebra is commonly seen in company with the beisa oryx, both animals frequenting the same class of country. The difference in the size and shape of the hoof between this zebra and the bonte-quagga is very marked, the horse-like spoor of the present species being totally distinct from the donkey-shaped footprints of the other. In stony country the soles of an old individual's hoofs are sometimes worn almost quite flat, frog and all. The species is the largest of all

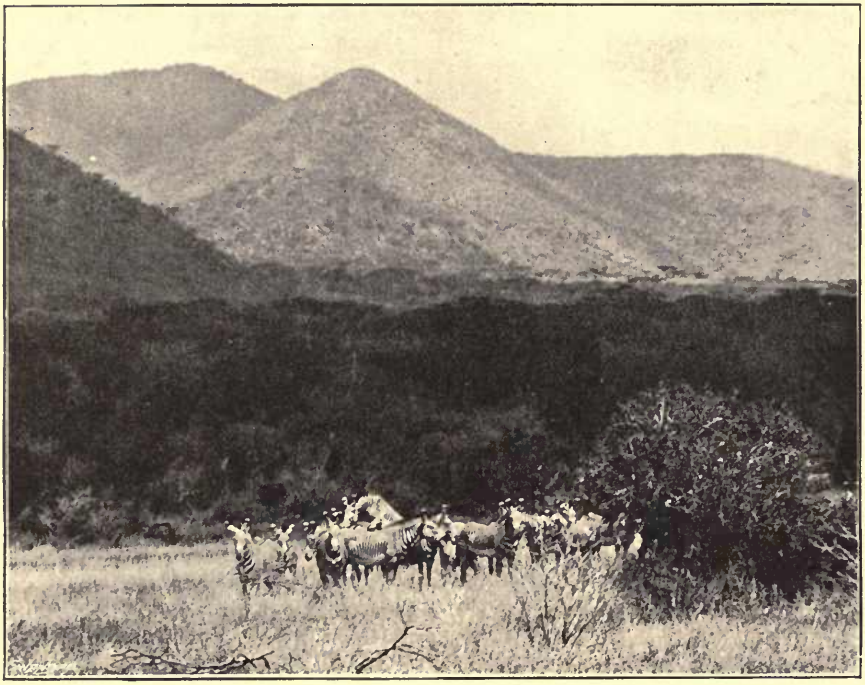


FIG. 16.—A Herd of Grévy's Zebras, near the south end of Lake Rudolf.

the zebra group, standing from about 4 feet 9½ to 4 feet 11 inches at the shoulder.

In Somaliland, according to Col. H. G. C. Swayne, the localities which these zebras seem to prefer in Ogaden are low plateaus, some 2500 feet above sea-level, the sides of which fall in broken ravines to the river-valleys. On these plateaus is a powdery red surface-soil producing a rich pasture, with occasional outcrops of rock, and stunted thorn-forest growing in scattered clumps. The zebras inhabiting this broken hilly ground are met with in small droves of about half-a-dozen. The

meat of this zebra is highly prized by the Somali tribes of the districts it inhabits; the flesh is excellent, rather better, in fact, than any antelope-venison except oryx, and tasting somewhat like beef.

FIG. 17.—A Dead Grévy's Zebra, photographed by Lord Delamere.

Although the species was unknown in Europe in modern times till 1882, it appears that a specimen was sent in the seventeenth century by the King of Abyssinia to the Governor of Batavia, and a second

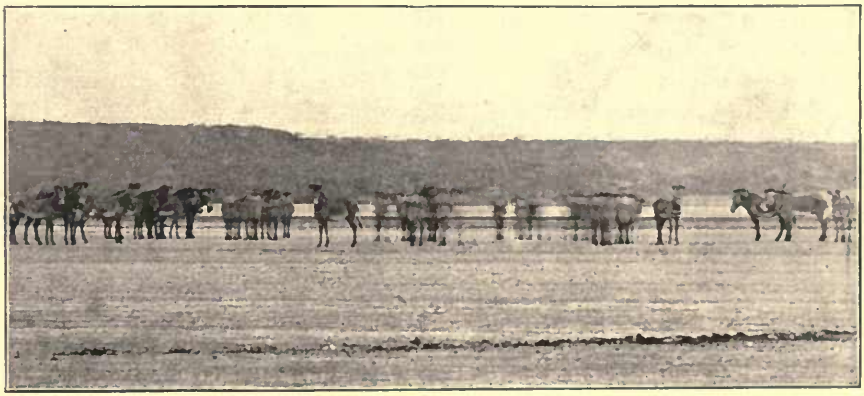


FIG. 18.—A Herd of Grévy's Zebras, photographed by Lord Delamere near Lake Rudolf.

to the Sultan of Turkey; and it was probably this zebra that was occasionally exhibited in the Roman amphitheatre under the name of *hippotigris*.

Mr. Neumann remarks that while the cry of the bonte-quagga is a succession of melodious barks in double or triple notes, that of Grévy's

zebra is a very hoarse kind of grunt, varied by something approaching to a whistle, the grunts being long drawn out and divided by the shrill whistling sound, as if the latter were made by drawing in the breath which had been expelled during the sustained grunt.

To the south and west the limit of the range of *Equus grevyi* appears to be the Tana river from the sea to where the Mackenzie river enters from the north, and thence along the latter river to its source in the Jambeni Hills; the boundary then seems to follow that range to Mount Kenia, and thence crosses the Gwaso Nyiro to the Lorogi Mountains, from which line it is continued to the south end of Lake Rudolf.

THE QUAGGA

(*Equus quagga*)

HOTTENTOT NAME, *Quàha*

(PLATE ii, fig. 2)

The extinct South African quagga, like the following striped species, has the callosities on the front legs larger than in Grévy's zebra, and the stripes broader. Whenever, in this group, the hind-quarters are striped, the stripes are obliquely longitudinal, with the uppermost ones arising from the hind part of the body, where their upper extremities are bent backwards towards the root of the tail in such a manner that there is no concentric arrangement round the latter. The muzzle is dark and usually black, and the stripes on the nose are continuous with the dark patches round the nostrils. The ears are narrow.

In the quagga, which was confined to the open karoo, or plains south of the Orange river, the ears are comparatively small, the front hoofs are rather large, and full striping is developed only on the head, neck, and fore-quarters, although in some specimens spots on the flanks indicate disappearing stripes farther back. The stripes stop short of the lower surface of the body. The general colour appears to have been yellowish red, or chestnut, although it is now impossible to be certain on this point.

In the British Museum this species is represented by the mounted skin and skeleton of a male formerly living in the Zoological Gardens in Regent's Park. That animal, which was one of the last survivors, was presented to the Zoological Society by Sir George Grey in 1858,

and lived in the menagerie till June 1864. About ten living examples of the quagga appear to have been exhibited from time to time in menageries. Three skins, a skeleton, and two skulls represent the quagga in the United Kingdom, in addition to which two other skeletons have been stated to belong to this species. Continental museums are more fortunate, possessing among them, in addition to several skeletons and skulls, no less than eleven mounted skins, one of which is that of a fœtus. In the South African Museum this once abundant species is represented only by a foal. A skeleton at Philadelphia, said to be that of a quagga, completes the list of known remains.

It is very probable that several local races of the quagga formerly existed, and four of these have already been recognised and named. In the case of an extinct species it is, however, difficult to arrive at any satisfactory conclusion with regard to its local forms; and, in any case, a discussion of these would have but little interest for sportsmen.

The following observations in regard to the colouring of quaggas and zebras were contributed by Mr. R. I. Pocock to *Nature* for 1903.

The testimony of observers in the field has established the truth that the coloration of the coat renders a zebra invisible under three conditions, namely, at a distance on the open plain in mid-day, at close quarters in the dusk and on moonlit nights, and in the covert afforded by thickets. One reason for this is the blending of the white stripes with the shafts of light sifted through the foliage and branches and reflected by the leaves of the trees, so that in an uncertain light or at long range these mutually counteract each other and fuse to a uniform grey. It is also probable that the alternate arrangement of the black and white bars contributes something to the effect produced, by imparting a blurred appearance to the body and destroying the evenness of its surface owing to the difference in light-reflecting power between hairs of these hues. Again, the extension of the stripes to the edge of the body and legs breaks up the continuity of the outline, this being apparently the reason for the alteration in their direction on the hind-quarters and limbs, so that, except on the forehead, the whole animal is barred transversely with reference to the lines of its spine and limbs.

When a quagga lies down, with the hind-quarters depressed, the fore-legs folded, and the hind-legs tucked in close to the body, the white on the back of the thighs is brought into line with that of the under-parts, and a continuous expanse of white, obliterating the shadow, extends all along the under side from the knee to the root of the tail. The same is the case with the under-mentioned bonte-

quagga ; and it indicates in the case of the latter the meaning of the change in pattern presented by the different local races as we pass from Somaliland southwards to Cape Colony. In correlation with the adoption of a life in the open, a new method of concealment by means of shadow-counteraction was required, and was perfected by the toning down of the stripes on the upper side and the suppression of those on the hind-quarters, legs, and under-parts.

The description by Sir Cornwallis Harris of the quagga, as he knew it in 1837, runs as follows :—

"The adult male," he writes, "stands 4 feet 6 inches high at the withers, and measures 8 feet 6 inches in extreme length. Form compact. Barrel round. Limbs robust, clean, and sinewy. Head light and bony, of a bay colour, covered on the forehead and temples with longitudinal, and on the cheeks with narrow transverse stripes, forming linear triangular figures, between the eye and mouth. Muzzle black. Ears and tail strictly equine ; the latter white, and flowing below the hocks. Crest very high, arched, and surmounted by a full standing mane, which appears as though it had been hogged, and is banded alternately brown and white. Colour of the neck and upper parts of the body dark rufous brown, becoming gradually more fulvous, and fading off to white behind and underneath. The upper portions banded and brindled with dark brown stripes, stronger, broader, and more regular on the neck, but gradually waxing fainter, until lost behind the shoulders in spots and blotches. Dorsal line dark and broad, widening over the crupper. Legs white, with bare spots inside above the knees. Female precisely similar."

The quagga was originally known to the Boers of Cape Colony as *wilde esel*, or wild ass, to distinguish it from the zebra, which they named *wilde paard*, or wild horse. Later on it was, however, more generally called by its Hottentot name *quagga*, or rather *quacha* (pronounced *quaha*), which refers to the two notes of its cry or neigh.

In Gordon Cumming's time, about the year 1843, quaggas inhabited the plains in the north of Cape Colony, and especially near Colesberg, in large numbers. The Dutch colonists were, however, busy in killing the game ; Gordon Cumming writing that, during his stay on the flats adjoining Thebus Mountain, scarcely an hour elapsed at morning, noon, or eve but the distant booming of a Dutchman's gun saluted the ear. In time this led to the extermination of the species, which appears to have been killed off between 1865 and 1870 in Cape Colony, and probably between 1870 and 1873 in the Orange River Colony.

The range of the quagga seems to have been very circumscribed, and included Cape Colony, westward of the Kei river, certain parts of Griqualand West, and the plains of the Orange River Colony; but it is possible that the species may have occasionally wandered as far as the southern border of Bechuanaland. In Cape Colony it probably ranged almost to the verge of the Indian Ocean, wherever open country offered suitable feeding-grounds.

FIG. 19.—The Quagga.

The quagga was essentially a denizen of the open plains, where it associated in large troops. Occasionally, however, it seems to have wandered into the hills, since Barrow, in his *Travels*, writes as follows: "The hills that surrounded the plain of Geel-bek [a small river to the south-west of the Great Karoo] were composed of a dark purple-coloured slate; and among these were seen prancing a small herd of that beautifully marked animal the *zebra*, and a great number of another species of wild horse, known in the colony by the Hottentot

name of *qua-cha*." But all travellers and hunters speak of the quagga as a true lover of the wide and open plains, revelling in a perfect state of unrestricted freedom. In his *Wild Sports of Southern Africa* Cornwallis Harris states that the quagga was still found within the Cape Colony, where it inhabits the open plains south of the Vaal river in immense herds. In another passage he writes: "Moving slowly across the profile of the ocean-like horizon, uttering a shrill barking neigh, of which its name forms a correct imitation, long files of quaggas continually remind the early traveller of a rival caravan on its march." Inquiries made by Mr. H. A. Bryden of old Dutch and British farmers in Cape Colony, who remembered the quagga in the wild state, confirm the statement that the species was habitually a dweller upon the wide karoos and plains.

THE BONTE-QUAGGA OR BURCHELL'S ZEBRA

(*Equus burchelli*)

Quagga OR *Bonte-Quagga*, CAPE DUTCH; *Peetsi* OR *Peetsi Folatsar*, BECHUANA

(PLATE ii, fig. 3)

Although the typical southern race of the exceedingly variable species known scientifically as *Equus burchelli* is commonly called Burchell's zebra, it is much better designated by its Boer title of bonte-quagga (*i.e.* striped or painted quagga), since this obviates the use of such exceedingly ill-sounding and inconvenient names as "Chapman's Burchell's zebra." The species is closely allied to the quagga, from which, indeed, it is perhaps not really separable; but the stripes are always well developed on the hind-quarters, where they present the characters mentioned under the heading of the last-named animal. Bonte-quagga display remarkable variation in colouring and markings as we proceed from south to north; the typical southern race having dark brown stripes with intervening brown "shadow-stripes" on an orange ground, and unstriped legs, whereas in the northern race the stripes, which are black on a white ground, extend right down to the hoofs, and have no intervening shadow-stripes.

In all cases the upper extremities of some five or six stripes on the hind half of the body are bent backwards parallel to the dorsal stripe; while the light area between these body-stripes and the dorsal

stripe is continued to the root of the tail, and is not crossed by transverse bars, but traversed longitudinally by the backward extension of at least one of the body-stripes.

The typical Burchell's bonte-quagga, or Burchell's zebra (*Equus b. typicus*), now nearly, if not completely, exterminated as a wild animal, formerly inhabited British Bechuanaland and some of the adjacent districts in enormous droves. In this typical race the ground-colour is orange, and the shadow-stripes on the hind-quarters are strongly marked, and narrower than the main stripes, which are themselves broader than the light interspaces containing the shadow-stripes. The hind-quarters have only a few short stripes below the long stripe running to the root of the tail; the body-stripes stop short on the sides of the under-parts, so as to be widely separated from the longitudinal ventral stripe; and, with the occasional exception of a few on the knees and hocks, the legs are devoid of stripes, as are usually the sides of the tail.

The original specimen in the British Museum, brought home by the great African traveller, Dr. Burchell, was, unfortunately, destroyed at a time when little attention was paid to the priceless value of "types." The national collection has, however, now one specimen, and there is a second in the museum at Tring, and a third in the Bristol Museum, which come very close to the typical form, although neither is exactly similar, and each differs slightly from the other. There is also a specimen in the American Museum of Natural History, which was purchased from Messrs. Barnum and Bailey's travelling menagerie in the year 1885, and another in Paris.

Nearly allied is the Damaraland bonte-quagga (*E. b. antiquorum*), in which stripes are developed above the knees and hocks, but none (or very few) below.

To mention all the local races that have been named is unnecessary in a work of the present nature; but the following are the most important.

In the Zulu bonte-quagga (*E. b. wahlbergi*), like all those which follow, the body-stripes meet the ventral stripe inferiorly, while the legs are more or less fully striped. In this particular race the shadow-stripes on the hind-quarters are strongly developed, and not much narrower than the main stripes, which are narrower than the intervening spaces; and the fetlocks and pasterns are devoid of stripes or spots. This race is represented in the collection of the British Museum by a specimen purchased in 1846 from the African naturalist and collector Wahlberg, after whom it is named. A female zebra from

the Transvaal, differing from the typical *wahlbergi* by the extension of the shadow-stripes on to the neck, has been named *E. b. transvaalensis*. In Chapman's bonte-quagga (*E. b. chapmani*) the shadow-stripes have become faint and narrow, the legs are marked to the hoofs, but the stripes on their lower portions tend to break up into spots, and the inferior part of the pasterns is not wholly black. This race inhabits the country between Damaraland and Matabililand. The last representative of the species with distinct shadow-stripes is the Mashonaland bonte-quagga (*E. b. selousi*), which differs from the last in that the striping of the legs is complete right down to the hoofs, the pasterns being striped on both sides, and their lower portion, owing to the fusion of several stripes, wholly black. The sides of the tail are also striped.

The foregoing races inhabit the country south of the Zambesi, but they have a representative north of that river in the Kilimanjaro bonte-quagga (*E. b. boehmi*), which is nearly allied to *E. b. selousi*, but retains scarcely any trace of shadow-stripes, while the stripes on the pasterns remain distinct from one another. The shadow-stripes are frequently visible only on the hind-quarters.

The two most northern races are Crawshay's bonte-quagga (*E. b. crawshayi*) of British Central Africa, or Nyasaland, and Grant's bonte-quagga (*E. b. granti*), ranging from British East Africa (Masailand) as far north as southern Abyssinia. In both these races the shadow-stripes have completely disappeared, and the principal stripes on the hind-quarters are not narrower, and may be broader, than the intervening spaces, which are white. In *E. b. crawshayi* the stripes are relatively narrow and deep black in colour, while the nostril-patches are yellowish brown, or tan, and the pasterns coloured like those of *E. b. selousi*. In *E. b. granti*, on the other hand, the stripes are broader and apparently less completely black, while the nostril-patches are black, and the stripes on nearly the whole of the pasterns have fused into a continuous black patch. It is noteworthy that the difference between *E. b. granti* on the one hand, and *E. b. typicus* on the other, in the matter of colour and pattern, is much greater than that between the latter and the quagga. A zebra from the Duma valley, German East Africa, has been named by Dr. Matschie (*Weidwerk in Wort und Bild*, 1906, p. 236) *Hippotigris muansæ*, and is said to differ from *transvaalensis* by the arrangement of the stripes round the eye.

According to an account furnished by Mr. F. C. Selous, it appears that bonte-quaggas begin to breed in August, "although most of the

foals are born in September. They are very easily caught when young, and soon become quite tame. If one gallops in between a very young foal and its mother, the former will sometimes follow one's horse right back to camp. These zebras run with considerable speed and endurance, but are not so fast as the large antelopes living in the same country with them, and I have often galloped right through a herd of them. This species is fond of feeding in company with other animals, such

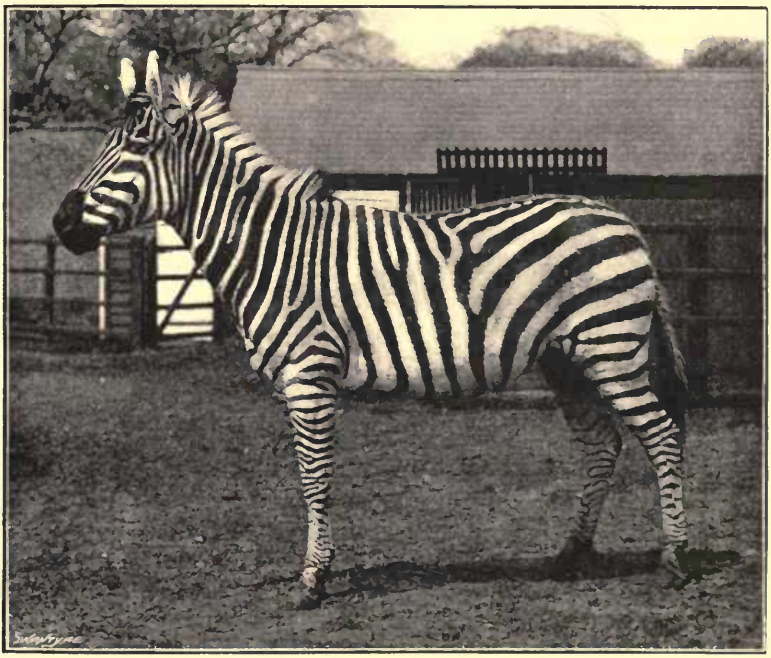


FIG. 20.—The Kilimanjaro (?) Bonte-Quagga, one of the fully striped races, photographed by the Duchess of Bedford from a living specimen at Woburn.

as buffaloes, blue wildbeests, elands, gemsbucks, and roan and tsessebe antelopes. They are not naturally very wary, and in parts of the country where they have not been much disturbed, and are therefore unsuspicious of danger, they are very inquisitive. When hunting to the north of the Pungwi river in 1892, in a part of the country where I suppose the Burchell's zebras had never seen a man with any clothes on, these animals often came to within 100 yards to have a good look at me; and on one occasion a large herd approached within 50 yards, and after I had sat down on the side of an ant-heap, stood staring at

me for about half-an-hour, and only ran off when I at last got up and walked towards them. I once watched a small herd approaching my three horses, which were feeding about 200 yards away from where my waggon was outspanned behind a cluster of trees and bushes. They first came boldly up to within 50 yards of the horses, and stood looking at them for a long time. Then one, bolder than the rest, commenced a cautious approach, closely followed by the others. After many halts they at last came to within ten yards of the horses, which had been all the time unconcernedly feeding, without paying any attention to their visitors except now and again looking towards them. At last the boldest of the zebras walked to within three or four yards of the nearest horse, and, reaching out his nose, sniffed at him, and evidently not quite liking the smell, jumped round with a start and trotted away a few yards, closely followed by his companions. He soon, however, returned and sniffed at the horse, again springing away suddenly. This performance was continued for more than an hour, when at last the zebras walked off in the direction from whence they had come. I think that Burchell's zebras are not such savage animals as is usually supposed, since I have seen one or two that were very quiet and well-broken, whilst even the half-broken animals, which were at one time used on the coach line between Pietersburg and Tuli, did not seem very vicious. That they can both bite and kick I know, as I have often seen a wounded one bite the shaft of an assegai with which a Kafir was despatching it, and I once rode up to a wounded one and just touched it with the muzzle of my rifle on the hind-quarters, when it threw up its hind-feet like lightning and kicked three of the back-sights off my rifle. Whilst feeding undisturbed, Burchell's zebras seldom neigh or emit any sound whatever, but should a herd be pursued and one of their number shot, one or two of the survivors will be sure to be heard repeatedly calling for the missing 'member of the party.

"This call is always kwa-ha-ha, kwa-ha-ha, which has earned for the species the name of kwa-ha among the Boers of South Africa. The bold black-and-white stripings on the coat, which render these zebras so handsome when viewed at close quarters, are not apparent at any great distance. When standing in shade at a distance of 400 yards they look of a uniform greyish-black colour, although if the sun is shining on them they appear almost white."

The experiment of training bonte-quaggas for draught has not proved a decided success; for, although they are immune to the attacks of tsetse-fly, they are lacking in stamina and endurance.

THE ZEBRA

(*Equus zebra*)

Daow OR *dauw* OF THE HOTTENTOTS

(PLATE ii, fig. 5)

The true zebra, often termed the mountain zebra, in order to distinguish it from the bonte-quagga or Burchell's zebra of the plains, is a very different animal from the latter, and much more nearly related to the wild ass. In the first place, the direction of the hairs along the spine between the withers and the rump is reversed, so that they are inclined forwards instead of backwards. In the second place, the ears are considerably longer, the hoofs are narrower, and the tail-tuft is more scanty; while all the body-stripes, with the exception of two passing on to the rump and hind-quarters, are continued upwards to meet the longitudinal dorsal stripe which they cut at right angles. Then, again, the area on the rump between the dorsal stripe and the uppermost haunch-stripe running to the root of the tail, in place of being longitudinally striped, is marked by a series of transverse bars forming what is called a "gridiron-pattern." Finally, the body-stripes stop short on the sides, so as to be far removed from the ventral stripe.

In the old days the zebra was found in all the mountain-ranges of Cape Colony; but it is now restricted to the Cradock district, where it survives only by means of rigid protection on the part of the Government. The species is, however, represented in Angola by a local race known as Penrice's zebra (*E. zebra penricei*), and in Damaraland by Hartmann's zebra (*E. z. hartmannæ*), although it is by no means certain that these are really separable.

Unknown to the north of the Zambesi, the zebra formerly ranged from Angola through Damaraland and Namaqualand to the various mountain-chains of Cape Colony, ending with the Drachensberg. Occasionally, it seems, it might descend to the intervening valleys, but the true home of the species was in the precipitous mountains, at elevations of between 2000 and 5000 feet, or even as much as 7000 feet, above sea-level. At such elevations snow and severe frosts are experienced in winter; and in unusually cold winters these proved too

much even for the hardy constitution of the zebra. These animals, it is stated, are almost as active on rugged and precipitous ground as wild goats, galloping up and down steep places in a manner which could scarcely be expected of a member of the plains-loving horse family.

Mr. H. A. Bryden gives the following account of his experiences

FIG. 21.—The Zebra, from a specimen in the London Zoological Gardens.

of one of the last troops of zebras left on the Witteberg range, between Graaf Reinet and the coast, somewhat to the north-west of the Great Winterhoek :—

"The friends with whom I was staying," he writes, "refrained from shooting them or allowing them to be shot at, and they were occasionally encountered on some of our expeditions after antelope. I came suddenly upon them one day, in company with

a Kafir hunter, far up amongst the mountains, amid some of the wildest scenery of the district. We stood within a couple of hundred yards or so, and had ample opportunity to observe the troop, before the stallion, standing sentinel, discovered us. Eventually our presence was observed, and at a wild neigh from the stallion the zebras galloped away over the mountain-shoulder and were lost to view. On another occasion I saw them descending a steep mountain-side, down which they clattered with the greatest apparent ease. As a rule, they were most suspicious beasts, extremely hard to get near, and even if we

FIG. 22.—Hind-quarters of the Zebra.

had wanted to shoot specimens, we should have had desperately hard and tough stalking to bring one to bag. The history of this particular troop was somewhat singular. The animals occasionally wandered over the mountains beyond our boundaries on to adjacent farms, where they were shot at by Dutch farmers; and their numbers gradually dwindled until only the stallion remained. This finally ran with a troop of donkeys which were allowed to range the hills, and was driven into a kraal and captured. He was extremely savage and, although fastened with ropes to a tree, was always ready with open mouth and bared teeth to attack any one approaching. Full-grown and too old to tame, he steadily refused all food, but would drink

water greedily, disposing of three buckets at a time. After three weeks' attempt to keep him alive and tame him, he finally perished of exhaustion. I heard some years after that a fresh troop of zebras trekked into the Witteberg from some other range to take the place of this vanished herd."

"In the old days in Cape Colony," continues Mr. Bryden, "the Boers were in the habit of hunting zebras for the sake of their hides,

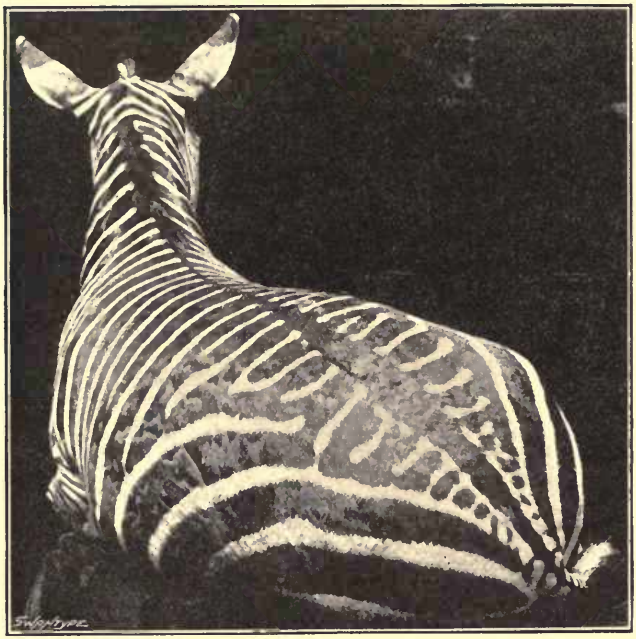


FIG. 23.—Ward's Zebra.

and of capturing the young alive for the purpose of being broken to harness. The adult zebra is practically untamable, and several instances are on record of the ferocity of these creatures. The Boers, to save themselves the trouble of shooting, occasionally succeeded in driving a number of these animals over the edge of a precipice, thus securing the skins at their leisure. Pringle mentions the instance of a young Boer, who was engaged in this kind of chase, when a zebra turned on him, seized him by the foot with its teeth, and actually succeeded in biting and tearing it from the limb, the young man subsequently dying from the wound. When captured young, the zebra seems to be capable of being broken and becoming amenable

to harness, although it was probably not so easily tamed as Burchell's zebra."

In the *Proceedings* of the Zoological Society of London for 1904 (p. 181) Prof. J. Cossar Ewart described a zebra, probably from the district between the upper part of the Tana river and Lake Rudolf, resembling *E. zebra* in height, the form and size of the head, ears, and muzzle, in the characters of the mane, tail, and hoofs, and also in the gridiron-pattern of the rump-stripes (fig. 23). It differs from that species in the backward inclination of the hairs of the broad dorsal stripe, and in certain details of striping and colour, the ground-colour being rich cream. The name of Ward's zebra was suggested for this animal, although no scientific designation was proposed.

In the same journal for 1906 (p. 691) the Hon. Walter Rothschild described, as *Equus annectans*, a zebra from North-East Rhodesia, distinguished by its narrow white stripes and broad black stripes extending from behind the ears to the root of the tail. The longitudinal stripes, which extend from the root of the tail more towards the shoulder than in any other zebra, are united to the transverse stripes, instead of being broken, as in most races of the bonte-quagga. In the absence of chestnut on the face it resembles *E. burchelli selousi*. The head, limbs, and tail are evenly marked with narrow white stripes on a black ground; and the ears are also strongly striped. The skull is stated to be somewhat intermediate between that of the zebra and that of the bonte-quagga.

THE AFRICAN WILD ASS

(*Equus asinus*)

Duber Dibhuded, SOMALI

(PLATE ii, fig. 1)

The last of the African representatives of the horse family is the wild ass, which is found in north-eastern Africa, south of the Tropic, from upper Nubia to Somaliland. It is the only species of wild ass found within the tropics, and the only one which is completely grey at all seasons of the year.

In size the wild ass is medium or large, the height at the shoulder ranging from 3 feet 9½ inches to 4 feet 1 inch. The ears are very long, the hoofs small and narrow, with no marked superiority in the

size of the front pair, the tail-tuft is moderate, and there is no trace of a forelock. The dark dorsal stripe is narrow, and in some cases discontinuous, not reaching the tail-tuft, and without white borders. Either a shoulder-stripe or dark barrings on the legs are present, but there is no dark ring above the hoofs. There is a distinct white ring round the eye, but no white on the buttocks or rump. The general colour of the upper-parts at all seasons is pure or tawny grey-fawn; the muzzle, a ring round each eye, the under surface of the lower jaw, the inside of the ear, the under-parts, and the inner surface and much of the lower portion of the legs, being white. Apparently there is no marked, if any, difference, either in colour or length, between the summer and the winter coat. The cry is the well-known bray.

Of the two races, the Nubian wild ass (*Equus asinus africanus*) inhabits north-eastern Africa, that is to say, Sennar and Nubia, its range formerly extending as far as the fifth cataract of the Nile, and eastwards to the river Atbara and the Danakil district, but not including Abyssinia. Year by year the range of this race appears to become more restricted; and unless protective measures be taken, there is danger that it may be exterminated. The race is characterised by its generally inferior size (ranging from about 3 feet $9\frac{1}{2}$ inches to 3 feet $11\frac{1}{2}$ inches) as compared with the Somali ass, the generally greyish-fawn colour, the continuous although narrow dorsal stripe, the presence of a short shoulder-stripe, and of a dark patch on each side of the front fetlocks, and the absence of distinct dark barrings on the legs.

A small breed of the Nubian wild ass inhabits the island of Socotra, which appears to have been originally imported from the mainland. These donkeys stand only about $3\frac{1}{2}$ feet at the shoulder, and are characterised by perfect similarity in colour and markings, the nose, a wide ring round the eye, as well as the chest and belly, being white, and the legs nearly so, thus contrasting strongly with the mouse-coloured head and back. The black stripes on the shoulder and down the middle of the back, and a few somewhat irregular dusky rings round the legs are clearly defined.

The second, or Somali, race (*E. a. somaliensis*) ranges from Somaliland, through Danakil and Gallaland, to the Red Sea. It is distinguished from the Nubian race by its superior size, the pale and more greyish colour, the absence of a shoulder-stripe, the slightly developed and discontinuous dorsal stripe, and the presence of a number of distinct black bars on the legs, and of a brownish patch on the front of each foot above the hoof. The head and ears are also

relatively shorter, with less black on the front of the tips of the latter; the mane is longer and inclined to be pendent; and the white round the eye and on the muzzle is less pure and less sharply defined from the fawn, while there is no white on the under side of the lower jaw and the angle of the throat.

Sir Samuel Baker gives the following graphic account of the wild ass in the neighbourhood of the Atbara river: "Those who have seen donkeys in their civilised state can have no conception of the beauty of the wild and original animal. . . . In its native desert it is the perfection of activity and courage; there is a high-bred tone in the deportment, a high-actioned gait, when it trots freely over the rocks and sand with the speed of the horse. When it gallops over the boundless desert, no animal is more difficult to approach; and although they are frequently captured by the Arabs, those taken are invariably the foals, which are ridden down by fast dromedaries while the mothers escape."

THE AFRICAN BUFFALO

(*Bos* [*Bubalus*] *caffer*)

Buffel, CAPE DUTCH; *Inyati*, MATABILI AND ZULU; *Nari*, BECHUANA AND BASUTO

(PLATE iii, figs. 1-3)

With the African buffalo, which is a species displaying extreme local variation both in the matter of size and colour, as well as in the form of the horns, we come to the first representative of the suborder Artiodactyla, or those hoofed animals in which the pair of toes corresponding to the third and fourth fingers and toes of the human hand and foot are symmetrical to a vertical line drawn between them. The highest development of this type of foot-structure is presented by the "cloven hoof" of the ruminants; but the feet of the pig and the hippopotamus are constructed on the same general plan. In the giraffe and the okapi, as well as in a few antelopes, like the pala, only the large middle pair of hoofs remains; but more generally, as in all the members of the ox group, there is also a pair of small lateral hoofs to each foot. Many striking peculiarities are associated with this characteristic type of foot-structure, but it will suffice to mention in this place that when appendages are present on the head, these take

the form of a pair situated on the forehead, although in the giraffe there may be an additional one of a different type in advance of these.

The *Bovidæ*, or hollow-horned ruminants, which include oxen, buffaloes, sheep, antelopes, etc., agree with okapis, giraffes, and deer in the absence of upper front teeth, and in the crescent-like form assumed by the grinding surfaces of their cheek-teeth, as well as by the circumstance that in the front of the lower jaw the single pair of canine teeth is approximated to the incisors, so as to form with the latter four pairs of somewhat spatula-like teeth. In the hollow-horned ruminants, as well as in deer, these lower canines are similar in form to the incisors; but, as will be shown later, in okapis and giraffes they are of a more complex type. The hollow-horned ruminants are specially characterised by their horns, which take the form of hollow, unbranched, cylindrical sheaths, covering bony processes of corresponding form arising from the forehead of the skull, to which they remain attached throughout life.

In the members of the ox tribe, forming the genus *Bos*, with several subgenera, the horns, which are nearly as large in the female as in the male (and, indeed, in some cases actually longer), generally extend more or less outwardly from the head, and are cylindrical, compressed, or angulated, without either distinct knots or bold transverse wrinkles or rings. The long tail is either tufted at the end or (rarely) long-haired throughout; the head is massive and carried low; and the large ears may be fringed with long hairs. The colour of the hair is generally uniform, although there may be white "stockings," and (very rarely) a white rump-patch. The face is without glands, and the broad muzzle moist and naked. The females have four teats. Very important is the form of the cheek-teeth, which in the upper jaw have tall, square, prismatic crowns, not very dissimilar to those of the horse tribe, but with a different pattern on the grinding surface. Oxen range over all the continents of the world except South America and Australia.

The wild African representatives of the genus belong to the subgenus *Bubalus*, or buffaloes, in which the large horns are more or less distinctly angulated at the base, and are set lower down on the head than in the typical oxen. Although the extreme forms of the series are very unlike, all the African buffaloes may be regarded as local races of a single variable species, of which the typical representative is the great black buffalo of the Cape (*Bos caffer typicus*), in which the horns of old bulls almost meet in the middle line of the forehead

and form an enormous shield-like mass. In striking contrast to this is the small red buffalo, or "bush-cow" (*B. c. nanus*), in which the general colour is tawny orange-red, while the small horns are widely sundered at their bases and show a more or less marked upward tendency. The difference between these extreme forms is very great, but gradations exist which tend to connect the one with the other. For instance, in the *Field* newspaper of January 5, 1907, I made some remarks on a tawny-coloured buffalo killed by Major Powell-Cotton in the Semliki district, for which the name *B. c. cottoni* was suggested. Specimens which subsequently came to my notice indicated that black individuals occurred in the same herd, and from the condition of the teeth in the skull of one of the latter I came to the conclusion that the Semliki buffalo turns black when fully adult (see *Proc. Zool. Soc.* 1906, p. 996). A letter from Mr. A. Yale Massey, of the Tanganyika Concessions Limited, dated Ruwe, on the Lualaba river, in the southern angle of the Congo Free State, to the west of Katanga, affords evidence to the same effect. This gentleman states that he recently shot a black buffalo near Lake Kabele, a few miles west of the Lualaba, about 9° south latitude. He adds that red buffalo (one of which was wounded by a fellow-sportsman) occur in the same herd as the black, the former being designated by the natives *kendi*, and the latter *mbea*. So far as could be seen, the two types differ only in the matter of colour. It, therefore, seems practically certain that they belong to one and the same race; and the presumption is that the dark red individuals are immature, and the black ones fully adult. If this be confirmed it will indicate that the red buffalo, or "bush-cow," of West Africa is the primitive representative of *Bos caffer*, and the large black Cape buffalo the specialised form of the species, while the South Congo races are the intermediate type. The colour-development of the species, on this view, will be of the same type as that of the bantin, or Javan wild ox, only in this instance we have a fuller illustration of the mode of evolution, the West African race retaining the original red throughout life in both sexes, while the Cape animals develop a sable coat in both sexes soon after the calf stage. It would be interesting to know if the cows of the South Congo buffalo are red at all ages.

The races of the African buffalo have been worked out in a paper by Dr. Paul Matschie, of the Berlin Museum, published in the *Sitzungs-Berichte der Gesellschaft Naturforschender Freunde* for 1906, of which the following is a summary.

According to Dr. Matschie's views, almost all distinguishable local

forms of animals are classed as species rather than subspecies, and the phases of the African buffalo are, therefore, accorded specific rank. They are, however, here regarded in the light of local races of a single variable animal. Since several of them are known at present merely by the skull and horns, the form of the latter appendages is taken as the main basis of classification. When tested by specimens in the collection of the British Museum, the characters assigned to the different races appear to a certain extent constant and fairly easy of recognition.

The races are divided into two main groups, respectively typified by the great black buffalo of the Cape and the small red buffalo of the Congo. In the black buffaloes, as the members of the first group are collectively designated, the massive horns are strongly bent backwards from the sides of the skull in such a manner that the front aspect of their middle portion is situated far behind the plane of the forehead.

The first representative of the group is the Zambesi buffalo (*B. c. wiesei*), typically from the middle part of the Zambesi valley between Loangwa and Revegu, or near the point of entrance of the Revabwe river. In common with those of the four following races, the horns curve sharply inwards from their point of maximum span towards the middle line of the skull, while in this particular race the backward flexure of their central portion is very pronounced, and the outer part has also a backward trend, although the tips are not distinctly bent downwards.

The Azrek buffalo (*B. c. asracensis*), of the Bahr-el-Azrek, the affluent of the Blue Nile forming the southern frontier of Abyssinia, presents a nearly similar inward curvature of the horns from the point of greatest span, but the backward trend is much less marked, and the tips have a distinct downward bend.

In the Limpopo race (*B. c. limpopoensis*) the outer part of the horns lacks a backward trend, while (in contradistinction to those of the preceding races) the horns extend forwards considerably in advance of the plane of the boss formed by their bases, which is very greatly developed. The type skull came from Gasaland, but a pair of horns obtained by Mr. F. H. Barber near the Sabi river, and here figured, as well as a head from Nuanetsi depicted by Mr. J. G. Millais in *A Breath from the Veldt*, belong to this or a closely allied race.

The horns of the Ankoli buffalo (*B. c. radcliffei*), from south-west Uganda, differ by the extreme flatness of their basal portions, which do not form a prominent boss.

With the Orange river race (*B. c. gariepensis*), from the district

about the upper course of the Orange or Gariep river, we come to a second subgroup, in which the horns, in place of curving immediately inwards at the point of maximum span, curve at first backwards; this particular race being distinguished from the allied forms by the length of the smooth tips of the horns, which exceeds the entire horn-length, and likewise by the marked thickening of the basal portion of the horns.

Shorter tips, not exceeding one-third the total length, distinguish the horns of the Ruaha race (*B. c. ruahensis*) of German East Africa, in which the bases are as much thickened as in the preceding race.

FIG. 24.—African Buffalo (Ankoli race), from a specimen killed by Mr. F. A. Knowles in Uganda.

On the other hand, the Uganda buffalo (*B. c. neumanni*), typically from Changwe, has the bases of the horns flattened, and the short tips diminishing rapidly in diameter, and directed mainly upwards, with a very slight inward and backward direction, the greatest span being directly below the tips. This buffalo is said to be very like the Sudan race, from which it differs by the distinct backward sweep of the basal portion of the horns.

The last member of this group is the Cape buffalo (*B. c. typicus*), of which the type locality is the valley of the Sunday river, not far from Algoa Bay. In this race the horns do not show a prominent basal boss, and their smooth tips diminish very rapidly in calibre, and are

distinctly bent inwards and backwards, the widest span occurring where the central axis of the tips cut the horn. This race apparently ranges up the east coast as far as Zululand. Its alleged distinctness from the Orange river race, which is the one with the very massive boss to the horn bases, is in accordance with what occurs in the case of the races of the African elephant.

Two other races, the Pangani buffalo (*B. c. pihillingsi*) from the middle Pangani valley, in the Usagara district, and the Wembaeri buffalo (*B. c. wembaerensis*), from a swamp near the Wembaeri plateau, have been described more recently by Dr. Matschie. They belong to the present group, but I have not access to their description.

The members of the second main group, which may be collectively termed red buffaloes, although in some races the adults are dark brown or blackish, are characterised by the horns extending upwards and outwards from their bases in practically the same plane.

The first representative of this group is the Togo buffalo (*B. c. thierryi*) of Togoland, between Ashanti and Dahomey on the west coast. In this race the long axes of the smooth tips and the rough basal portions of the horns form a right angle with one another, the long tips tapering rapidly and having approximately the same direction as the free basal edges of the horns, while their summits are separated by an interval exceeding one-third the diameter of the maximum span. In the dwarf red buffalo, or "bush-cow" (*B. c. nanus*), of the Congo coast the tips form an acute angle with the free basal edges of the horns, and are separated at their summits by an interval less than one-fourth of the greatest span. In the Loanda race (*B. c. mayi*), another west coast type, the horn-tips taper more gradually and less markedly than in the preceding, and do not exceed one-third the total horn-length.

In the remaining races the long axis of the smooth terminal portion of the horns forms an acute angle with that of the rough basal portion.

The first representative of this subgroup is the Lake Tchad buffalo (*B. c. brachyceros*), in which the smooth horn-tips exceed one-third the total horn-length, while they have an inward, and near the summits an inward and backward, inclination, and their long axis forms an angle of about 35° with that of the basal portion.

From this race the Kivu buffalo (*B. c. mathewsi*), from the region between Tanganyika and the Albert Edward Nyanza, differs by the more marked backward and inward direction of the horn-tips, while their axis forms with that of the basal portion an angle of about 65°.

The name of Sudan buffalo may be employed (in place of Abys-

sinian) for *B. c. æquinoctialis*, which was first named on the evidence of a skull brought by Consul Petherick from East Central Africa, but is also known to occur on the White Nile. The tips of the horns are short, less than a third of the whole horn-length; they taper rapidly, and are directed more inwards than backwards, while their axis forms an angle of about 56° with that of the basal portion, which is much thickened.

The Senegambian buffalo (*B. c. planiceros*) may be distinguished from the preceding by the nearly cylindrical bases of the horns (fig. 26), which are not markedly thickened, and the gradual tapering of the terminal portion; this being directed upwards and strongly inwards and back-

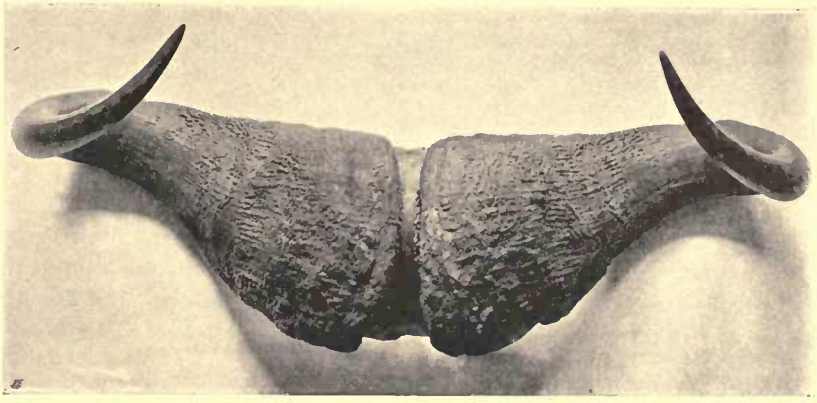


FIG. 25.—Horns of the Limpopo Buffalo, from a specimen shot by Mr. F. H. Barber on the Sabi river.

wards, with its axis forming an angle of about 80° with that of the basal portion.

In addition to these there is the Semliki buffalo (*B. c. cottoni*), described by myself in the *Field* of January 5, 1907, which is red when immature, and dark brown or blackish when fully adult (at all events in the case of the bulls). I am not in a position to compare its horns with those of the other members of the red group, but it differs from the Kivu race in having the tail-tip black in place of white.

In regard to the subdivision of the buffaloes of southern Africa by Dr. Matschie, the following comments were furnished by Mr. F. C. Selous to the *Field* for January 1908 (vol. cxi. p. 71):—

"It would be of interest to know the number of skulls and horns on which Dr. Matschie has based his conclusions as to the distinctness

of the Orange river buffaloes from those inhabiting other parts of South Africa, and also the date when these skulls and horns were obtained. The buffaloes living on the Orange river were, it must be remembered, not an isolated race, but only the advanced guard of the species which originally had spread southwards from the valley of the Limpopo by way of the Notwani and Marico rivers to the Molopo, and thence through Bechuanaland to the Orange river. In those days south-western Africa was not such a dry desert country as it is now. Perennial streams, the haunt of the hippopotamus, then poured their waters into the Orange river through Griqualand and what is now the eastern portion of the Kalahari Desert, and the buffaloes no doubt followed the courses of these streams southwards. I think, at any rate, it is more probable that buffaloes reached the Orange river from the countries to the north rather than that they spread northwards from the coast through the plateaus of Cape Colony.

"These buffaloes, living along the banks of the Orange river, seem, however, either to have been all killed off, or driven northwards again into southern Bechuanaland a long time ago, as although the French traveller Le Vaillant met with buffaloes on the Orange river about the year 1783, the missionary John Campbell does not mention seeing any of these animals during his travels in 1813 until he reached a point not far from the present town of Kuruman, in southern Bechuanaland.

"Since, therefore, buffaloes ceased to exist along the Orange river so long ago, one would imagine that there must be very few skulls and horns in existence in Europe to-day which certainly came from that locality, and unless Dr. Matschie has had the opportunity of examining a large number of the skulls and horns of buffaloes from every part of South Africa in which these animals were once found, it appears to me impossible to establish the truth or otherwise of his view that there were once several different species or races of the Cape buffalo existing in Africa south of the Zambesi, distinguishable one from another by the constant differences to be observed in the conformation of the horns of the males.

"Unfortunately, this is a question which can now never be definitely settled, since throughout the whole of Africa south of the Zambesi there are but very few buffaloes, comparatively speaking, left alive. In this portion of the continent these fine animals have entirely ceased to exist over vast areas throughout which they once ranged in great numbers.

"For my part, I do not for a moment believe that if a collection of 1000 heads of buffalo bulls existed to-day, which had been brought

together indiscriminately from every part of South Africa where these animals were once found, either Dr. Matschie or any one else could tell from what district each came. I have seen thousands upon thousands of Cape buffaloes, and examined hundreds of pairs of horns —bulls and cows—from such widely separated parts of the country as Cape Colony, the neighbourhood of the Pungwi river, and the Chobi, not to mention many intermediate areas, and nothing struck me more than the great individual differences between horns, not only in every such district, but in every herd in the same district.

"In distinguishing one race of buffalo from another, Dr. Matschie

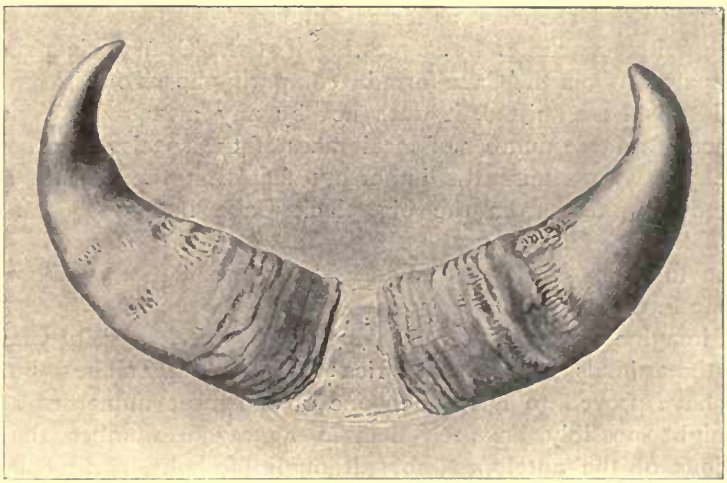


FIG. 26.—Horns of the Senegambian Buffalo.

seems to rely a great deal on the comparative length of the 'smooth tips of the horns.' But surely this is a matter of age. Buffalo bulls in their prime, when they are always found with the herds of cows, have the smooth tips of their horns very long and usually growing in a beautiful curve; but as they grow older they gradually wear off the points of their horns, so that the horns of really old bulls are always very different in appearance from those of younger animals, which, although they may have obtained the full horn-growth over the forehead, have not yet commenced to wear the points down.

"Both the two buffalo-heads referred to in the above *résumé* of Dr. Matschie's paper—the one shot by Mr. J. G. Millais on the Nuanetsi river, and the other the one figured on page 72, and now

in the possession of Mr. F. H. Barber—are those of animals in their prime, with the long points grown to their maximum length. We know from Mr. Millais that the bull he shot was a herd-bull, and from the appearance of the fine pair of horns in Mr. Barber's possession, I should certainly say that the animal which carried them was likewise a male. As buffalo bulls grow old they wear the points of their horns down more and more, until at last the whole of the smooth tip forming the upward curve of the horn disappears. More than a foot is often worn off the total length of the horn.

"According to Dr. Matschie, the true Cape buffalo (*B. c. typicus*), which is still found in the Addo bush in the Cape Colony, only ranges northwards along the coast as far as Zululand."

The writer concludes by suggesting that the Orange river race has been separated from the Cape form by comparing horns of different ages. Even if this be admitted, it does not by any means invalidate the existence of a large number of local races of the species; neither does it in any way minimise the important fact that there is an almost complete gradation from the big black Cape buffalo to the small red buffalo of the west coast.

The following account of South African buffaloes is abbreviated from one furnished by Mr. Selous:—

"I imagine that if a census could have been taken sixty years ago of all the animals existing in Africa south of the Zambesi, buffaloes would have proved to have been one of the most numerous species, and might possibly have rivalled in aggregate number the most gregarious of the antelopes; for although blesboks, springboks, and black wildebeests were then in countless thousands on the plains of Cape Colony, the Orange River Colony, and the Transvaal, they were confined to a comparatively small area of country, whereas the buffaloes, in innumerable good-sized herds, were distributed over the whole of South Africa, from Mossel Bay to the Zambesi, wherever there were bush and water.

"The Europeans who, some sixty years ago, first penetrated to the southerly portion of the Bechuanaland Protectorate and the north-western Transvaal met with great herds of buffalo on the upper waters of all the westerly tributaries of the Limpopo, such as the Marico and Notwani; but in 1872 I found that these animals had ceased to exist on any of the upper tributaries of the Limpopo, though they were still abundant along the central course of that river and on all its northern tributaries to the eastward of the Macloutsie. In 1876 I came across a herd of from 200 to 300 buffaloes on the

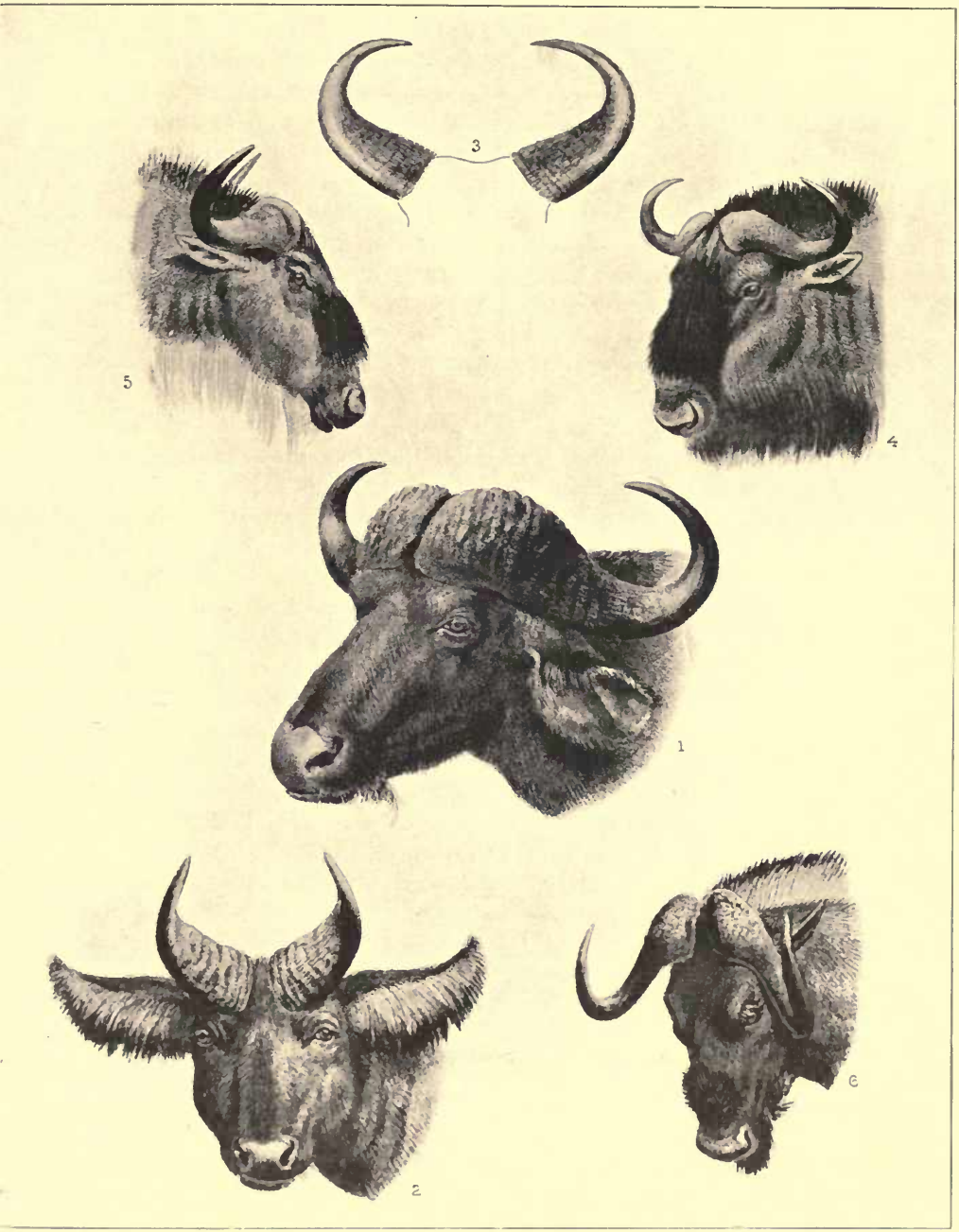


PLATE III

1. Cape Buffalo.
2. Congo Buffalo.
3. Lake Tchad Buffalo Horns.
4. Brindled Gnu.
5. White-bearded Brindled Gnu.
6. Gnu.

Ramokwebani river, close to the waggon-track from Tati to Bulawayo, and at that time there were probably other herds in south-western Matabililand. These, however, were rapidly shot down—chiefly by native hunters—till in 1895 only one small herd was left in the country, and this was probably swept away by rinderpest.

"In the latter part of 1872, when hunting to the north-east of Bulawayo, so soon as I got beyond the Matabili kraals and cattle-posts, I found buffaloes numerous. In 1873, to the north-west of Bulawayo, where the country was covered with forest and bush, buffaloes, often in very large herds, occurred wherever there was water. The following year I followed the Zambesi westwards to the mouth of the Chobi, and then hunted for several months along the latter river. Buffaloes were still abundant along the Zambesi in the neighbourhood of the Victoria Falls, and I saw a large herd grazing on a small grassy island to which they must have swum from the mainland; and on the Chobi we found them in prodigious numbers all along the river, although never more than a mile or so away from the water. In 1877 I again visited the Chobi, and although the buffaloes had been driven from the neighbourhood of Kazungula, the trading-station at the junction of the Chobi and the Zambesi, they were still in vast numbers a little farther up the former river. In 1879 I found them numerous along the Machabi river (an outlet of the Okavango), as well as in the neighbourhood of the great reed-bed in which the Mababi river loses itself. Till 1878, buffaloes were also numerous along the Botletli river near Lake Ngami, but in that year they were all killed or driven away by the Boers on their way to Ovampoland. From 1879 to 1891, although my wanderings often led me into the district between the plateau of Mashonaland and the Zambesi, where buffaloes were fairly numerous, I did not again meet with them in large numbers till I visited the valley of the Pungwi in the latter year, and again in 1892. During these two seasons I once more found myself in a district where buffaloes were to be seen almost daily in large herds, although less numerous than they once were on the Chobi.

"Buffaloes calve from January to March, some months later than any of the antelopes living in the same country. The calves are reddish brown when newly born, but, as they grow, the red tinge gradually disappears, when they become dun-brown, not turning black till they are nearly if not quite three years old. When in their prime, buffaloes in South Africa are covered with a fairly abundant coat of coarse black hair, while the large drooping ears are edged with

long black fringes of softer hair. The tassel at the end of the tail, though well developed, is perhaps not so thick or so wavy as in ordinary domesticated cattle. With age both bulls and cows gradually lose their coats, at first along the back behind the shoulders, after which the baldness spreads till very old animals become almost as devoid of hair as wart-hogs, and finally lose both the fringes on the ears and the tassel at the end of the tail.

"In districts suitable to their habits, where pasture is abundant, buffaloes used to consort in herds of from 50 to 200 or 300 individuals, and I once, on the banks of the Chobi, saw at least 1000 together, although on that occasion I believe that several herds had joined company, and were moving up the river together in search of grass.

"Old bulls that have been driven from the herds by younger and more vigorous males either live alone, or in twos and threes, though in parts of the country where buffaloes are very numerous five or six old bulls will often associate, and I once saw fifteen, although such a concourse is unusual. In hot weather buffaloes drink twice a day, early in the morning, and again late in the afternoon. In the cool of the evening and during the early part of the night they feed on grass and young reeds, then lie down till after midnight, rising to feed again towards morning. Soon after daylight they again drink, and then continue grazing until the sun begins to get warm, when they retire into thickets or forest where they can obtain shelter from the sun, and there lie and rest till late in the afternoon. In the cold weather they only drink once a day, usually just after dark. Where they have not been molested, buffaloes will often lie all day long in the shade of trees growing immediately on the banks of the river they frequent; but when persecuted they retire to the densest thickets, and although never going far from water, will often walk, after drinking, several miles in the bush, parallel with the course of a river, before lying down to rest for the day. Where they have never been hunted, buffaloes are unsuspicious of danger and easy to approach against the wind. Old bulls, indeed, will often almost refuse to get out of the way, but lie or stand gazing unconcernedly at the sight of a human being, until he is within 50 yards of them, while possibly one or other of a party of four or five will trot a few paces forwards to get a better view. I have, however, never known a buffalo bull to charge under such circumstances. If you keep walking steadily towards them, sooner or later one will turn and trot off sideways with its nose in the air, and then break into a heavy gallop, when the rest will follow.

"When much persecuted, buffaloes soon become wary, and will

desert their usual haunts in thick covert, and resort during the heat of the day to the open mopani forests, where they can obtain a good view in every direction. In such situations they could not have been comfortable, as they were much exposed to the heat of the sun, but they were fairly safe, as no enemy could approach unseen.

"When pursued on horseback, a large herd of buffaloes will only run at a slow heavy gallop, that a horse can keep up with at a hand canter; but a buffalo, though short in the legs and heavily built, is capable of running at a great pace when so minded, and I have known a wounded cow overtake and dash to the ground a horse going at its utmost speed. This horse was indeed old and in poor condition; but a charging buffalo will press the best of South African shooting-horses pretty hard for a short distance, and might even overtake them in thick bush.

"When a buffalo is wounded it always seeks thick covert, either in jungle, reeds, or long grass, although, unless badly wounded, it will not lie down for some time, but stands behind a bush or other covert, listening intently, with its head turned in the direction of its tracks. If approached incautiously in such a position it will charge, with hoarse grunts, when its pursuer is within ten yards, and then nothing except a shot in the brain or some other nerve-centre will check its rush. As a buffalo always charges with its horns laid back on the sides of the neck, and the nose held straight out in a line with the back, it is very difficult to hit the brain, and a bullet in the chest, right through the heart, even with a heavy rifle, will not stop a charge at close quarters, though of course it will kill within a short time. A wounded buffalo, if followed into thick covert, is thus a very dangerous animal, as he is hard to see until you are close upon him, and difficult to avoid or stop when he charges. Many accidents have happened under such circumstances, but, considering the enormous number of buffaloes that have been shot in South Africa, the accidents have been proportionately few and far between. Personally I do not consider the Cape buffalo to be naturally vicious or ferocious.

"When wounded, a buffalo nearly always does its best at first to get away, and so long as it is pursued through open forest, in which it is able to see its assailant approaching from a distance, will seldom charge but keep on retreating. When followed into thick covert it is, however, a different matter, for a wounded buffalo may be expected to charge should he suddenly see his enemy appear within a few yards. In comparing the relative danger of buffalo-hunting and lion-hunting, I put the matter thus. In ground where one might follow a wounded

buffalo, without or with little danger, it would be dangerous to follow a wounded lion; whilst in ground where it would be really dangerous to follow a wounded buffalo, it would be more dangerous still to follow a wounded lion—at any rate in South Africa, where wounded lions are always likely to charge. I have not found old buffalo bulls more inclined to charge when wounded than herd-animals, and consider young bulls when nearly, but not quite, full-grown the readiest to resent ill-treatment. It must, however, be confessed that an old buffalo bull when disturbed, and standing with nose upraised, gazing fixedly at the intruder upon its solitude, with eyes glowing sullen and gloomy beneath the massive horns, has all the appearance of a savage and dangerous animal, though, as a matter of fact, in the great majority of cases, it is neither one nor the other, but merely ignorant and inquisitive, never having previously seen a man in hat and clothes. A little hunting causes bulls to give up this bold and truculent bearing; and they soon learn to run off as soon as they can make out a man approaching. Nothing made of flesh and blood in South Africa is more tenacious of life than a buffalo, though of course nothing can long survive a shot through the upper part of the heart or the big blood-vessels of both lungs.

"The latter is, I think, the better shot, as the wounded animal can be easily tracked by the blood from the mouth and nostrils. Should a buffalo, when fired at, drop instantly, it is unwise to approach incautiously with an unloaded rifle, for, if only momentarily paralysed by the shot having grazed the vertebral column in the neck or along the back, it may recover and spring to its feet at any moment. If it does so, it is pretty sure to charge any one that may be close at hand. When a buffalo rises, he gets on his hind-feet first, and this sometimes gives time to fire at the head or chest before the animal can get into a standing position. A dying buffalo nearly always gives vent to several moaning bellows, which can be heard at a considerable distance, and when once heard will never be forgotten.

"I once heard a calf, separated from its mother, calling very much like the calf of a domesticated cow; but as a rule buffaloes are silent. I have often listened for an hour at a time to large herds feeding at night within a few hundred yards of my camp, and never heard any sound but an occasional short grunt, though I have heard a buffalo, when attacked by lions, bellow like an ox. Buffaloes are strong swimmers and take to the water readily, either to escape danger or in search of pasture; swimming low in the water, with only the eyes, nostrils, and part of the horns and hind-quarters above the surface.

The horns of bulls attain their full length before the animals are completely adult, and while the lower portion of the horn-cores in the centre of the forehead is still covered with skin, as in cows. After this each horn begins to displace the skin on the forehead, until at last two great rounded bosses of horn are formed, which overshadow the eyes and often touch in the middle line. When they actually touch in a living buffalo, they shrink apart soon after death, when it will be seen that there is a narrow strip of skin, perhaps a quarter of an inch in width, between their bases, connecting the skin between the eyes with that behind the horns. A good pair of buffalo-horns will measure 3 feet 6 inches in a straight line from bend to bend (outside measurement) and 15 or 16 inches in depth over the forehead. They sometimes attain a spread of 4 feet, but as a rule wide horns are not very deep in the cushion. Although buffaloes do not usually stand more than 4 feet 10 inches at the shoulder, they must weigh very heavy, as they are enormously bulky. Bulls stand but little higher at the shoulder than cows, but are much more heavily built, with immense necks, and therefore look much larger."

The record horns are those of a buffalo shot in Uganda by Mr. F. A. Knowles (fig. 24). Their greatest outside span is 53 inches, and the inside span 49 inches, while the tip-to-tip interval is 47½ inches.

In East Africa, where it is known amongst the Swahilis as *nyati* and *mbogo*, the latter title being most in use amongst the Zanzibaris, and the former among the people of Mombasa, Melindi, and Lamu, the buffalo, according to Mr. F. J. Jackson, is now rare. "Till the end of 1889 and the beginning of 1890 it was, however, exceedingly common, being found all over the country where there were good grass and water. On the coast it lived in large herds close to the sea on the mainland near Lamu, and on both banks of the river Tana; at Merereni near Mambrui; while even within three or four hours' walk of Mombasa, at the back of Ferrestown, there was a fair number. The real stronghold of the species was, however, the Masai country, where, with perhaps the exception of Burchell's zebras and hartebeests, it was the most common of all the big game. From the southern slopes of Kilimanjaro to Lake Baringo buffaloes were practically unmolested by the natives, and were so common that scarcely a day passed without the sportsman coming across one or more individuals. In the northern part of Masailand, between Lakes Elmeteita and Baringo, they occurred in extraordinary numbers, and might be seen on the open plains even at mid-day, far away from covert of any kind. In one day's march of about 15 miles, I once

saw six large herds, one of which had to be driven off to allow the caravan to pass.

"The banks of the Turkwel river, which rises in Mount Elgon and flows east to Ngoboto, formed another stronghold, where buffalo congregated in large herds; while on the Mau plateau they were also abundant, and might be seen in dense black masses on the open grassy downs at all hours of the day. In fact they were so numerous in many places that, like zebras and hartebeests, they often proved an annoyance and hindrance to the sportsman after other and rarer game. On the coast they were confined to the thick bush, and only came into the open to feed late in the evening just before sunset, and returned again at daybreak or shortly after, and it was no doubt owing to constantly forcing their way through the bush, and also to the higher temperature and moist atmosphere that they had a totally different appearance from those found farther inland at higher and much colder altitudes. The buffaloes of the coast were almost hairless and of a dull lead-colour, whilst those in the Masai country were well covered with hair, and quite black.

"The buffaloes found on the Mau plateau, where it is much colder than the Masai country, were still more thickly coated with black hair, one old bull, killed at an elevation of 8000 feet, having large tufts on its face almost as shaggy as in a wildebeest. In size they never varied in different localities; an average bull standing 5 feet at the shoulder, and measuring 10 feet 6 inches in length, including the tail, which is 2 feet 6 inches. On the coast and in the Kilimanjaro district the great majority of the heads were wider in the palm in proportion to the spread, whilst those found farther north towards Lake Baringo had a wider spread in comparison with the width of palm.

"In 1890 rinderpest appeared amongst the native cattle, and spread among the buffaloes so rapidly that by the end of April they were decimated, and there are now [1900] few left. There are also three or four small herds in the Mau district, which confine themselves so closely to the dense undergrowth in the forest that they are practically unapproachable even to the Wanderobbo hunters, who can creep about in such places with less noise than a European. Since they are now so scarce and confine themselves to the thickest jungle, from which they only emerge late in the evenings to feed, it is more than ever incumbent on the sportsman to do his utmost to be on their feeding-ground in good time and endeavour to catch them in the open. He can then make a certainty of picking out a bull; whereas if he has to follow a herd into dense bush he is as likely as not to shoot a cow,

as on sighting an animal, probably at only a few yards' distance, he will have little or no time to determine whether it is a bull or cow, unless he can get a good view of its head.

"With regard to character and temperament, I consider the buffalo the pluckiest, and, when wounded, the most cunning and savage of all game considered 'dangerous.' Out in the open, when a deliberate and steady shot can be taken, and the bullet placed in the right spot, there is little to fear, and it may be killed with a small-bore rifle, but, once let it get into thick bush or long grass, a wounded buffalo is the most awkward animal to deal with, and as trying to the nerves as the keenest sportsman can desire."

The following particulars regarding the dwarf, or red, Congo buffalo were communicated by Major A. J. Arnold:—

"The dwarf buffalo, known in West Africa as the 'bush-cow,' resembles in general appearance an Alderney cow in miniature. Standing well under 4 feet at the shoulder, they are compact little animals, with clean outlines, clean legs, and totally devoid of the heavy look of the Cape buffalo. Their colour varies from the light red of the younger animal, deepening through the warm rufous red of the mature beast, to the deep dirty brown of the aged bull. The hair is short, and lies evenly on the skin throughout; but as old age creeps on, it wears off the folds of the neck (which become more marked), the shoulders and quarters, and deepens into a dark dirty brown easily discernible in the herd even at a distance. The difference between bull and cow is but slight, and lies chiefly in the bull possessing slightly longer hair and in greater depth of barrel; but even the bull retains the characteristic lightness of the breed.

"The following are the measurements of a cow:—

Height at withers	44 inches.
,, croup	46 ,,
Length along line laid on back from tip of nose to root of tail	78 ,,
Tail, total length	19½ ,,
,, tuft only	3½ ,,
Horns, outside curve	12½ ,,
,, between tips	11 ,,
,, between palms	4¾ ,,

"The following are the measurements of an old bull's horns:—

Outside curve	19½ inches.
Inside	15½ ,,
Tip to tip	15 ,,
Width of palm	7½ ,,

"As age increases, the space between the horns on the forehead decreases, but so far as my experience goes, the palms never actually meet. The horns are much prized by natives of West Africa for fetish ceremonies, where they are used for blowing the most hideous calls. The animal is nowhere very common, and unless such are to be found in the Congo wilds, large herds are unknown.

"As regards the character of the country most affected by this buffalo, contradictory statements occur. In my earlier years in West Africa I was given to understand by Europeans more or less acquainted with the country that it was in the dense bush of the big waterways, and in the thick forest-belt which extends parallel to the sea throughout the west coast to a depth of 100 miles from the sea, that I should find this animal, while, according to others, the more open bush, 150 to 500 miles from the sea, was its country. In my opinion, this buffalo seems to prefer a light open bush-country, well watered, with small belts of thick bush in which it can lie up in the daytime. The belt of forest beside the waterways may be replaced by the thick dense bush of the big gullies of the plateau-topped hills of Nigeria.

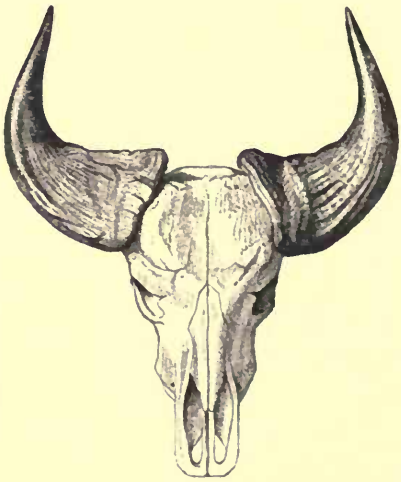


FIG. 27.—Skull and Horns of the Congo Buffalo, from a specimen shot by Major A. J. Arnold.

"As a rule, these buffaloes go about in pairs, with perhaps a calf; but near Lokoya, in Nigeria, at the junction of the Niger and the Benue rivers, I came across a herd of twenty. They appear to drink just before dawn, and then feed slowly either uphill towards the dense shady bush in the hillside gullies, or through the open scattered bush to some other gully, in the deep recesses of which they lie up for the remainder of the day.

"Throughout West Africa the 'bush-cow' has a reputation for ferocity, which I believe to be due more to the imagination of the natives than to any real danger incurred in hunting these animals. The slaying of a 'bona' is considered a great feat by the natives, men being occasionally met with who are known as 'bush-cow killers.' When a native kills a bull he must retire into his house and remain

there for ten days at the least, whilst his relatives make 'ju-ju' or sacrifices to the spirit of the deceased animal, whereby it is propitiated and endows its slayer with its own reputed qualities of fierceness and cunning. Should the hunter or his relatives be remiss in these devotions, the spirit of the bush-cow enters into the hunter to his own destruction, and he goes raging mad and dies.

"Hunting the 'bush-cow' is attended with difficulty, as it is shy and retiring, and when feeding in the open travels at a great pace. Perhaps the best method is to visit a water-side, not of the big rivers, but of one of the smaller streams, so soon as daylight permits of tracks being discerned, morning after morning, until fresh tracks of one that has been recently to water are seen. The tracks must be followed rapidly, and yet with caution, in the hope of coming up with the beast before it reaches the denser bush, where it is nearly impossible for the most experienced tracker to keep steadily on the spoor. Great caution is required, for the bush-cow is quick of hearing and has acute scenting powers. These buffalo are very tenacious of life, and will travel long distances when badly wounded. The skin, on an average $\frac{3}{8}$ inch in thickness, presents no great obstacle to a bullet, and I have put a hollow-pointed Paradox bullet into a bull broadside-on, which only stopped just below the skin on the farther side; but shot after shot may be put in before the beast comes to its knees, and, when down, it is a long time in dying, even when hit in a vital region."

THE ARUI OR UDAD

(*Ovis* [*Ammotragus*] *lervia*)

Udad, TUNISIA; *Arui*, S. ALGERIA; *Wadan*, TRIPOLI AND FEZZAN

As the oxen form one subfamily (*Bovinæ*) of the hollow-horned ruminants, so the sheep and goats, both of which are very poorly represented in Africa, constitute a second (*Caprinæ*). From the *Bovinæ* the members of this latter group are distinguished by the hairy muzzle, the form of the horns, which are generally small, or even wanting in the females, the higher carriage of the head, the presence of only two teats in the female, and, above all, by the structure of the cheek-teeth. In the upper jaw these teeth, although tall, have much narrower crowns than those of the oxen, and the number of isolated areas of ivory exposed on their grinding-surfaces is one less in each tooth. The horns of goats and sheep are always more or less

angulated, are frequently knotted or strongly wrinkled, and generally form either an open or a screw-like spiral. The two genera are very closely allied, and as they have so few African representatives, it will be unnecessary to indicate all their distinctive differences.

The arui, which is the only species of wild sheep native to Africa, inhabits the mountains of the northern fringe of the continent from Morocco, Tunisia, and Algeria in the west to Egypt and the eastern Sudan in the opposite direction, where its range extends nearly as far south as Khartum, or about latitude 16° N. Usually standing about 3 feet 3 inches in height, the arui is an altogether abnormal kind of sheep, on which account it has been referred to a subgenus by itself. Among its leading characteristics is the fringe of long hair on the throat and fore-quarters, the comparatively smooth, backwardly-curving horns, which are proportionately larger in the ewes than is generally the case among wild sheep, the great length of the tail, and the uniformly russet or chestnut colour of the coat, in both sexes and at all ages, as well, apparently, as at all seasons. Although in younger animals they are marked by fine parallel ridges and grooves—not to mention deeper lines indicating the limits of these annual growths—the horns of old rams become worn nearly smooth. Horns exceeding 25 inches in length are by no means common, but lengths of $29\frac{1}{5}$ and $33\frac{1}{4}$ are on record.

FIG. 28.—Head of Arui.

In the western portions of its range the mountains of southern Algeria, southern Tunisia, the interior of Tripoli, and the district of El Kantara, on the fringe of the Sahara, form some of the chief resorts of the arui, which is essentially an inhabitant of bare, almost waterless

tracts. Here among the scarped limestone crags and ravines, with rocks coloured red and yellow, the russet-hued sheep are almost invisible to European eyes, although easily detected by the keen vision of the Arab hunters. They are usually found in small family parties, consisting of an old ram and ewe, with the progeny of various ages and sizes. Their powers of speed and leaping are considerable ; and when on flat ground they start off in a series of long bounds. Thuja scrub and coarse dry grass form the chief vegetation of these arid tracts, where, according to Arab report, the arui drink only once every four or five days. In confinement, old male arui, like lions, develop a much more profuse growth of long hair than their wild relatives ; and such captive specimens cannot therefore be taken as typical representatives of the species. Despite the difference in the climate from that of its native barrens, the arui flourishes and breeds freely in European menageries. The species is not to be regarded as the ancestor of any of the breeds of domesticated sheep.

As regards its southern range, the late Dr. J. Anderson pointed out that the arui occurred in the mountains of Egypt, and I have information that in the Egyptian Sudan it extends nearly as far south as Khartum. This information I owe to Mr. A. L. Butler, head of the Game Preservation Department in the Sudan. The Nubian ibex has been generally supposed to range much farther south than the Barbary sheep, but this appears to be a mistaken idea. The sheep is, however, a much rarer animal, and also one much more difficult to find than the ibex, which probably accounts for previous lack of information with regard to its range. According to Mr. Butler's information, *Ovis lervia* occurs on a hill exactly fifty miles north of Khartum, that is to say, only just on the Mediterranean side of the sixteenth degree of north latitude. Although this seems to be its most southerly point, the species occurs in many of the other hills north of Khartum. From this southern range it might be urged that the arui, like the Nubian ibex, is entitled to be regarded as a member of the Ethiopian or true African fauna. This, however, I think is not the case. Both are members of essentially Holarctic (Euro-Asiatic) groups, and their occurrence in the heart of the Ethiopian region appears to be merely due to the accident of their being mountain animals, coupled with the southward trend of the mountain ranges of the Nile area. In such elevated districts both the sheep and the ibex find a congenial climate and suitable food, and there is consequently nothing to check but, on the contrary, everything to favour a large southern extension of their range in this part of Africa.

THE BEDEN OR NUBIAN IBEX

(*Capra nubiana*)

Beden OR *Bedan*, ARABIC

The most obvious distinction between sheep and goats (in which ibex are included) is the presence on the chins of the males of the latter of a beard of long hair, and the strong disagreeable odour exhaled by the members of that sex.

The beden is a true ibex, easily distinguished from both the European and the Central Asiatic species by the slenderness of the long horns of the bucks, in which the knotted front surface is very narrow, with the outer angle sharply bevelled away. Bucks stand about 33 inches in height at the shoulder; and in fine examples the horns may measure 40 inches or more along the curve, the maximum recorded lengths of the African race being 51 and 46⅛ inches. Does are smaller, with horns only 5 or 6 inches long.

FIG. 29.—Head of the Sinaitic Race of the Nubian Ibex.

The typical locality of the species is Upper Egypt and Nubia, but it apparently also exists in the mountains of Morocco and the interior of Senegambia, as it certainly does in those of Palestine and the Sinaitic Peninsula, as well as in those of the Hadramaut district of southern Arabia. The typical race (*Capra nubiana typica*) is the only

one with which we have to do in the present volume; but it may be well to mention that the Sinaitic race is distinguished as *C. n. sinaitica*, and the Arabian form as *C. n. mengesi*. In the Nubian animal the knots on the horns of the bucks are strongly developed and regularly arranged, but in the Sinaitic race they are lower and much less regular, so that the horns seem to make some approach to those of the Asiatic wild goat. The general colour of the upper-parts is brownish or yellowish fawn, probably varying according to season; with the muzzle, chin, beard, flanks, chest, nape-tuft, dorsal line, and outer side and part of legs (except knees and pasterns) blackish brown or black; and the inner sides of the thighs and buttocks, a streak on the abdomen, inner sides and back of hind-legs below the hocks, most of the corresponding surfaces of the fore-legs above the knees, and a band above each hoof, white or whitish. Horns black. According to an account given by Captain John Marriott, the breeding-season commences in September, and lasts for two or three weeks, after which the old males appear to leave the herds and retire to the mountain fastnesses, since they are then difficult to find. If, however, rain fall, and especially when accompanied by thunder, the old bucks reappear, traversing the country in search of the does, and may be found with the herds during October and November. From the latter month till January their coats are in the finest condition, but later on the colour begins to fade and the long winter-dress is gradually shed. Like others of their kind, these ibex are very acute of hearing and smell. Owing to their fear of leopards, they appear to remain much on the alert during the night; but after feeding in the early hours of the morning, they generally repose for an hour or two after about 9 A.M., and they always rest during the noonday heat—one watchful

FIG. 30.—A Nubian Ibex in the gardens at Ghiza, from a photograph by Captain S. S. Flower.

female being, however, always on guard. When fired at, these ibex invariably start straight away, seldom offering a second chance to the sportsman. In this respect they are unlike the sakin, or ibex of Central Asia.

THE WALA OR ABYSSINIAN IBEX

(*Capra vali*)

Wala, SIMIEN

This splendid ibex, the wala of the natives of the mountains of Simien (to which it appears to be restricted), differs from the Nubian species by its stouter build, shorter beard, and larger and more massive horns, on which the knots are but slightly prominent, as well as by its darker colour and superior size. The skull is also characterised by the presence of a prominent boss on the forehead. In height this ibex stands about 40 inches at the shoulder, while its weight is estimated at some 260 lb. The record horn-length is $43\frac{5}{8}$ inches.

Although described by the Austrian naturalist Rüppell so long ago as the year 1835, this ibex was known in Europe only by a few specimens, including several of the skull and horns, till 1901, when a fine series of complete examples was obtained in Simien by Major P. H. G. Powell-Cotton. Specimens are now exhibited in the British Museum, and in Mr. Rothschild's private museum at Tring.

Rüppell's description of the wala is as follows:—"Front and upper side of head, neck, and back beautiful chestnut-brown; muzzle, a curved streak between eye and ear, sides of neck, body, and rump reddish umber-brown. Region under the eye and ear, the chin, throat, chest, and inner surface of the thighs and belly dirty white. Outer side of thighs and legs and sides of belly dirty grey. Feet whitish, with a large spot at the fetlock and a stripe down the legs black. Root of tail chestnut-brown, tip black. Inner side of ears white, with a reddish border, outer surface red-brown. Iris of eye pale brown, pupil dark blue."

Major Powell-Cotton has furnished the following notes on the habits of this ibex:—

"This ibex is called wālā by the Abyssinians, and is said to exist only in the mountains of Simien. I shot four specimens at the commencement of autumn (end of June), just at the beginning of the

rutting-season. There were slight falls of snow and hail, and it was very cold at night. There are said to be two feet of snow on the hill-tops in August. On June 25, I saw two males and one female; later, on the same day, I saw a larger male, which I shot. On the 26th, I saw two large males feeding by themselves, and later on found them with thirteen females. On the 27th, I found the same herd and shot the two large males and one female. These were the only three large males on the ground. I searched a good deal of country round but only saw old tracks. The natives hunt these animals persistently for their flesh, skins, and horns (which they use for tumblers), and now that they are so much better armed, I believe in a very few years the animals will be extinct. I was told of some other hunting-ground farther to the north-east, but had not time to visit it. The three male specimens shot, and a head which I found, have the points of the horns turned inwards; but a pair of horns, presented to me by Dedjatch Zerefer, which he said were obtained on Mount Hi, had the points turned outwards.

"I found the ibex on the eastern slope of Mount Buiheat, one of the highest in the Simien range. The top is undulating grass-land, with a much frequented path running along close to the edge of the cliffs, at the foot of which is the ibex-ground.

"The cliffs being too high for a shot, and, so far as I could discover, there being no direct path down, it seemed to be a favourite amusement of passing caravans to roll over stones in the hope of seeing a herd disturbed. At the foot of the first line of cliffs, and below several lesser ill-defined lines lower down, are the runs and lying-up places of the ibex and klipspringer. The earth and stones dropping from above have formed banks some little distance from the face of the cliffs, while here and there an overhanging rock forms a roomy shelter under it. The ibex appear regularly to use these partly concealed runs in moving from one part of the ground to another, and it was in them that I found numerous traces of where native shikaris had lain up to get a shot at them, generally overlooking a drinking-place or a favourite shelter.

"The steep ground between the different lines of cliffs is covered with long coarse grass, along which the curious tree-lobelia (*Lobelia rhynchopetalum*) grows, besides firs, birch, and many scrubby bushes, the whole reminding me very much of the kind of place where I have shot thar in Kishtwar, Kashmir, and being quite unlike any ground where I had previously seen ibex.

"Even when the animals were feeding in the early morning and

late afternoon, it was by no means easy to make them out amongst

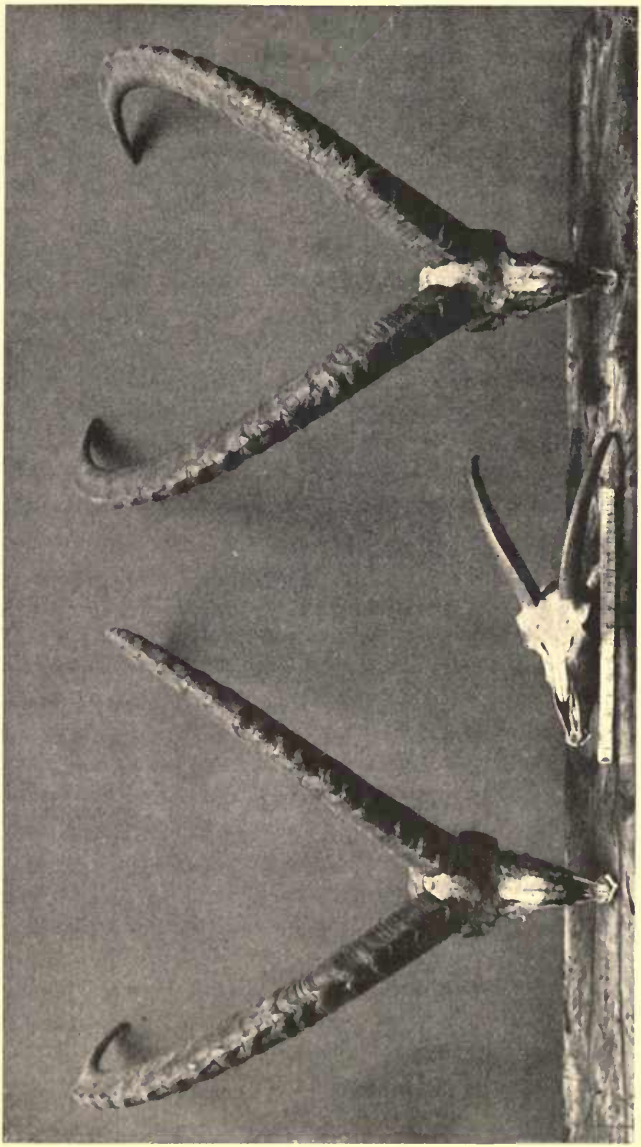


FIG. 31.—Skulls and Horns of Male and Female Wala, from Major Powell-Cotton's Collection.

the undergrowth. At the foot of the mountain large flocks of sheep and goats were grazing, being sheltered at night in caves, the openings

of which were protected by stone walls and wattles. Lower down there was a large stretch of cultivated land, and several groups of huts forming the village of Lurey."

THE BUBAL HARTEBEEST

(*Bubalis boselaphus*)

Kargum, TUAREG ; *Begra el Ouach*, ARABIC

(PLATE iv, fig. 1)

In spite of its general use, scarcely any name is less easy of definition than the title "antelope," which is applied to almost any hollow-horned ruminant coming under the designation neither of an ox, a sheep, nor a goat. Being far too useful and generally accepted to be discarded, it must be remembered that when this term antelope is used, it is employed in a very general, and not in a strictly zoological sense. That is to say, antelopes do not form a single subfamily of the hollow-horned ruminants of equivalent rank with the *Bovinæ* or the *Caprinæ* ; but rather include a number of such subfamilies, each of which ranks with the two latter.

The first of such subfamily groups is constituted by the hartebeests, bastard-hartebeests, and gnus, and is technically known as the *Bubalidinæ*. The members of this group are all more or less ungainly-looking ruminants of comparatively large size, with naked muzzles, small gland-apertures on the face below the eyes, and large valved nostrils, of which the lower lids are covered with a number of short bristly hairs. They have long tufted or hairy tails, and large lateral hoofs. There are no tufts of long hair on the knees, and the teats of the female may be either two or four. From the presence of horns in both sexes, the comparatively large size of those of the females, and the shape of those of the gnus, it might be inferred that the antelopes of this group are near relatives of the oxen. This, however, is negatived by the conformation of their cheek-teeth, which in the upper jaw have tall and very narrow crowns, more like those of the sheep and goats. The skull has shallow pits below the eyes for the face-glands, but no unossified spaces in this region, and no depressions on the forehead. The group is restricted to Africa.

From the other two genera the typical hartebeests are distinguished by their peculiarly elongated and melancholy-looking faces, maneless

necks, doubly-curved horns, which are more or less suddenly bent back about the middle of their length and heavily ringed, and the undue height of the withers and the lowness of the hind-quarters. They have the muzzle moderately broad, the nostrils close together and lined with stiff bristles, small hoofs, and the tail, which reaches below the hocks, moderately haired and generally with a thin crest of long hairs along the upper surface of the terminal half. The females have two teats. In colour, hartebeests may be either uniformly brown or rufous, or similarly coloured with the addition of blackish or purplish patches on the face, shoulders, hind-quarters, and lower portions of the limbs. The horns first rise outwards or backwards, then curve forwards and upwards, and are finally bent suddenly backwards and upwards. The hartebeests are arranged in four groups, according to the form of the horns and the development of the upward prolongation (pedicle) of the forehead on which they are mounted; the better-known species being the following:—

Horns U-shaped from in front, with a short pedicle:

Bubal Hartebeest.
Western Hartebeest.

Horns like an inverted bracket (⌣⌣), with a moderate pedicle:

Tora Hartebeest.
Sig, or Swayne's, Hartebeest.
Kongoni, or Coke's, Hartebeest.

Horns V-shaped from in front, with a very high pedicle:

Cape Hartebeest.
Lelwel Hartebeest.
Neumann's Hartebeest.

Horns greatly incurved before the final backward turn with a low and wide pedicle:

Lichtenstein's Hartebeest.

The bubal hartebeest, which is the typical representative of the group with U-shaped horns, is the smallest of all the species, and a native of North Africa, where it is known from the interior of Morocco, Algeria, and Tunisia, while it formerly extended into Egypt. The species is also stated to range into Palestine and Arabia, but in support of this statement there appears to be no tangible evidence.

Standing only about 43 or 44 inches at the shoulder, this hartebeest is reddish tawny in colour, with the tail-tuft black. In the winter-coat, at any rate, the hair is of considerable length and inclined

to curl, while there is a distinct hair-whorl on the forehead. A length of 14½ inches is the record for the horns.

Except for the fact that it associates in small parties in the mountains of the Sahara, practically nothing seems to be known of this hartebeest in the wild state. From many of its old haunts it appears to have been more or less completely exterminated.

THE WESTERN HARTEBEEST

(*Bubalis major*)

Kankī, HAUSA; *Elē*, YORUBA; *Orcha*, IGARA

(PLATE iv, fig. 2)

Whether this hartebeest, which was named in 1869 by the Indian naturalist Edward Blyth, and inhabits Senegambia, Lower Nigeria, and the interior of the Cameroons, the Gold Coast and Togoland, should be regarded merely as a large local race of the bubal, or as a distinct species, is not easy to decide, and is, moreover, a matter of no great moment. The horns are more massive, more bent at the angle, and with longer smooth tips than those of the bubal. The colour, according to Mr. W. E. de Winton, who described in the *Annals and Magazine of Natural History* for 1899, ser. 7, vol. iv. p. 358, the first complete skin ever brought to this country, is as follows:—

"The general colour is almost uniform dull chestnut; there is a distinct pale mark on the forehead from eye to eye; the only dark markings are dark brown or black stripes on the front of the legs, reaching from the hoof to about two inches above the knee on the fore-legs, and dying away before reaching the height of the hocks on the front of the hind-legs. The tail has a black tuft. The colouring of the animal is much like that of *B. lichtensteini*, but the darker saddle-area is not clearly defined, the colour shading gradually off, excepting on the buttocks."

Major A. J. Arnold, who gives the shoulder-height at from 46 to 54 inches, states that there is considerable individual variation in the shade of colour, dependent perhaps upon age; the extremes ranging from deep red to almost fawn-grey. Young animals are stated to be always lighter than adults.

The two largest pairs of horns on record measure, respectively, 26¾ and 25½ inches in length; but the ordinary range is from 16 to 24 inches.

According to Major Arnold, "*Bubalis major* is found in the hinterland of all the west coast from Senegal to the equator, and frequents chiefly the belt of light bush which intervenes between the dense tropical forest of the coast and the desert-lands of the Sahara. It is unknown in the dense belt, and also appears to avoid the more open country on the far side of the light bush area. In this belt, where it is frequently met with, it appears to prefer the scrub to the open spaces which occur at intervals. On and near the Niger it is common between Boussa and Idah, where the more or less hilly country is covered with the light tree-scrub. On the river Benue it is not found on the big stretches of open grass-lands which form a feature of that valley; but wherever the land rises and becomes covered with bush similar to that of the Niger this hartebeest is almost invariably encountered. It wanders about in herds of from half-a-dozen to a score, rarely exceeding the latter number: pairs are seldom met with, though single bulls may occasionally be seen well away from any herd. Young bulls appear to take to a solitary life on approaching maturity, probably before their strength is sufficient to enable them to maintain a sire's position in the herd. Old bulls likewise appear to be turned out of the herd, and may be met wandering alone.

"Keen of scent and also quick of sight, the West African hartebeest may at times be easily deceived, and, even when alarmed, frequently blunders to its death; so that even after considerable experience in hunting them, it is impossible to determine the probable behaviour of a herd when alarmed. More than once I have come suddenly upon a single individual within 50 yards, and by assuming an absolutely rigid attitude have so calmed its suspicions that it has continued quietly feeding. At other times, on the contrary, a glimpse of the hunter is sufficient to send a herd away at full speed, so that little more than the first glimpse is obtained. In my opinion, the powers of scent of this antelope are stronger and more relied upon than sight, for in those instances in which individuals have remained quiet whilst the hunter stood in full view, the wind was blowing direct from the animal, whereas with a cross-wind or in a hilly corner, where cross and circling currents of air may occur, these hartebeests always take alarm and hurry off at once. Again, when they encounter a man going up-wind these hartebeests generally bolt to one side, and then break-back behind their pursuer. The herds lie-up for the night, as a rule, in small open spaces, if possible well away from patches of grass or bush; and rising soon after daylight, the members

feed slowly and quietly away from the resting-place. Water-holes rarely show many tracks of these hartebeests, and it seems that little water is needed by these antelopes. Feeding is ended early, and by 9 or 10 A.M. the members of the herd are mostly lying under trees or standing in the shade with drooping heads, idly flicking away the flies. They are most easily approached at this time, particularly if the sportsman has discerned them in time, and can plan his stalk with reference to the wind. A herd with young ones is the most difficult to approach, as the calves do not seem to doze during the hot hours, but, capering and gambolling about, never farther than 50 yards away from their parents, form a vigilant guard, which often spoils the chance of a good head. The young are dropped between Christmas and the middle of February, and are strong and fleet almost immediately after birth.

"When at full speed these hartebeests exceed in pace any other antelope in West Africa. At a trot or canter they are exceedingly ungainly, but even at the latter pace they can easily outstrip a man mounted upon the best native pony; and when thoroughly alarmed, they stretch themselves out close to the ground, and for a mile can maintain a really tremendous speed. Their motions are, however, so deceptive that unless one has galloped alongside or behind them, or watched them cover a given distance, one would never realise the speed they can attain.

"In common with its relatives, the western hartebeest displays great tenacity of life, so that it sometimes appears quite impossible to kill them, as they seem able to stand being riddled through and through. I have, for instance, tracked one with four bullets in its body, and going on three legs, for hours, catching sight of it every now and then, until sheer exhaustion has compelled me to give up all hope of putting an end to its misery; and the same animal was seen for weeks afterwards by natives and other persons shooting over the same ground, but no one could ever bring it to bay, in spite of its dragging a useless hind-leg.

"The flesh of the West African hartebeest is somewhat coarse, and of a flavour decidedly too strong for European palates, except in default of other meat. In life the animal has also a strong odour, which cannot be mistaken, and invariably stamps a resting-place for several hours after the herd has left."

This fine species is represented only by the skull and horns in the exhibition galleries of the Natural History branch of the British Museum.

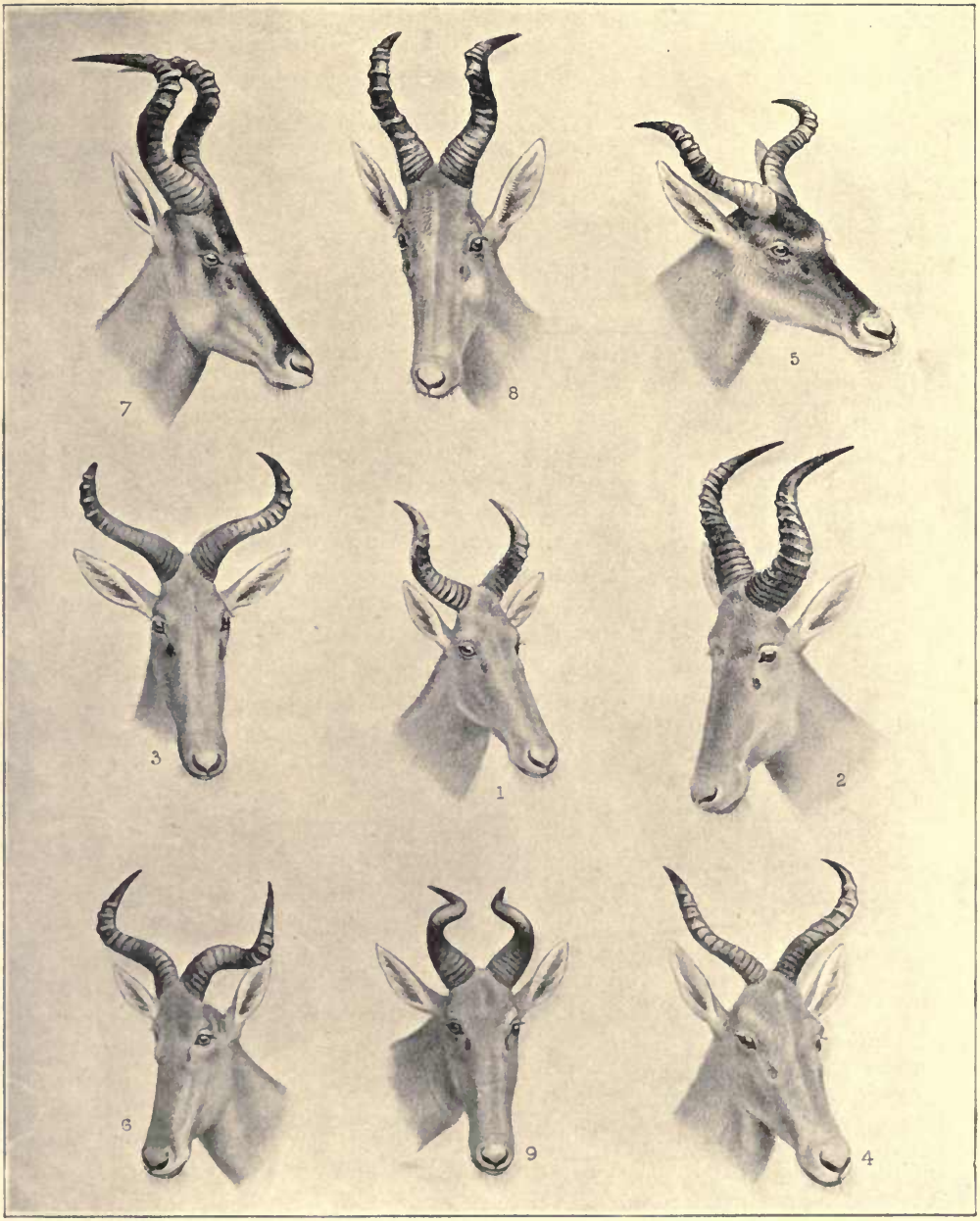


PLATE IV

1. Bubal Hartebeest.
2. Western Hartebeest.
3. Tora Hartebeest.
4. Neumann's Hartebeest.
5. Swayne's Hartebeest.
6. Coke's Hartebeest.
7. Cape Hartebeest.
8. Lelwel Hartebeest.
9. Lichtenstein's Hartebeest.

THE TORA HARTEBEEST

(*Bubalis tora*)

Titel, ARABIC; *Tora* OR *Woroba*, ABYSSINIAN; *Tori*, TIGRE

(PLATE iv, fig. 3)

With this species we come to a group in which the horn-pedicle is of medium height, while the horns themselves spread outwards in the form of an inverted bracket (⌒). In height the tora stands from about 48 to 54 inches at the withers; while in colour it is pale yellowish tawny, with the chin and tail-tuft black. The weight ranges from 300 to 400 lb.; and the record horn-length is $22\frac{1}{2}$ inches.

This hartebeest was first mentioned by the Austrian naturalist Heuglin in 1863, by whom, however, it was confounded with the bubal; and it was not recognised as a distinct species till 1873, when it was named by Dr. Gray. In the *Book of Antelopes* (Sclater and Thomas) Upper Nubia and Kordofan are included in its distributional area; but according to the Hon. Walter Rothschild[1] the species is restricted to Abyssinia and the southern part of the Blue Nile basin.

The representative of the tora from Rahat and thence to the middle portion of the valley of the Blue Nile was separated in 1906 by Mr. O. Neumann as *Bubalis tora rahatensis*, on account of a difference in the horns. In the Blue Nile race, as compared with the typical form, the horns are less distinctly bracket-shaped, and incline inwards at the bend nearly at a right angle. In the typical race they have little inward inclination, but are directed mainly backwards, and in a front view form an obtuse angle at the bend.

Mr. Neumann's original description will be found in the German serial known as *Sitzungs-Berichte der Gesellschaft Naturforschender Freunde* for 1906, p. 246.

In habits this species is probably identical with, or at all events very close to, the next.

In the valley of the White Nile the Blue Nile race is believed by its describer to interbreed with *B. lelwel niedecki* (fig. 32, p. 108), a head from Djebel Achmed Agha, on the White Nile, being referred to such a hybrid.

[1] Appendix to Powell-Cotton's *Sporting Trip through Abyssinia*.

THE SIG OR SWAYNE'S HARTEBEEST

(*Bubalis swaynei*)

Sig, SOMALI; *Korkei*, GALLA

(PLATE iv, fig. 5)

This species is the Somali representative of the tora, with which it agrees closely as regards the characters of the horns and their pedicles, but differs notably in the matter of colour. The general hue is light reddish chocolate-brown, with the tips of the hairs white; but, with the exception of the muzzle and the middle line, the face is black, as are also the shoulders, the upper part of the fore-legs, and a patch on each thigh. The shoulder-height has been given at 47 inches and the weight at 300 lb., and the record horn-length is $20\frac{1}{4}$ inches.

The Haud plateau of northern Somaliland is the type locality of the species, which in East Somaliland is represented by a race (*Bubalis swaynei noacki*) distinguished by its deeper and more purple-red colour, comparable to that of the tiang, and the less sharply defined dark blaze on the face, which thus presents a less striking contrast to the general colour.

Colonel H. G. C. Swayne, in whose honour the species was named, writes that "in Somaliland hartebeests are found on the elevated country, either in the open, treeless grass-plains, known as 'ban,' or in the light fringe of prairie-land, dotted with low thorn-bushes, which forms a belt round the edges of these plains. There are none on the plains near Zeyla, or on those of the Esa country; for, though conditions appear in other respects favourable for hartebeests, the grass is probably not of the right kind in these lower plains.

"In the Marar prairie and other great open tracts which occur in the vast thorn-forests of the waterless Haud plateau they were up to 1893 numerous, running in herds of five hundred or sometimes even a thousand, packed closely together, and looking like masses of cavalry. Many herds could be seen at a time, so that probably ten thousand head might be within sight at once. Hundreds of single bulls would at the same time be scattered over the plains between the herds, grazing or lying down, while a few herds of beisa oryx and Sömmerring's gazelle might also be visible. The plains are dotted

with ant-hills some 20 to 25 feet high, and for miles and miles—to the far horizon—nothing in those days met the eye but the greyish-green undulating plain, the immense herds of dark red hartebeests, or other game, and the red spires of the ant-hills. A herd of these hartebeests, if in little explored country, would usually allow the hunter to approach within 200 yards before going off at a gallop. Although clumsy to look at, this hartebeest is one of the fastest, and probably the most enduring, of all antelopes. The old bulls in a herd can be distinguished by their dark colour and thick horns as compared with the cows.

"The best way to make a good bag of these hartebeests is to pick out the single bulls, which are to be seen grazing apart from the herds: they are not so shy as the herd-animals, carry good horns, and will not be mistaken for cows. Where they have been much disturbed, it will probably be difficult to get shots at under 300 or 400 yards. The Lee-Metford rifle is very accurate at these distances, and as each miss throws up a puff of red dust from the ground, thereby assisting to correct the aim, it cannot be called unsportsmanlike to fire at single bulls at such a range, provided no shots are fired at random into a herd."

THE KONGONI OR COKE'S HARTEBEEST

(*Bubalis cokei*)

Kongoni, SWAHILI

(PLATE iv, fig. 6)

In this, the third, representative of the group with bracket-shaped horns, the pedicle is of moderate height, the horns are relatively short and thick, the general colour is uniform bright rufous fawn, with the under-lip somewhat browner, the lower portion of the rump paler, and the hind-legs whitish, while the long tail has the crest of black hairs extending unusually high up its hind surface. The shoulder-height is about 48 or 49 inches, the weight in one bull was 312 lb., and the record horn-length is $20\frac{3}{4}$ inches.

The kongoni is an eastern species, inhabiting German East Africa, where it is found from Usagara northwards to Kilimanjaro and Masai-land, and appears to be represented by a local race north of Lake

Rudolf, although the exact habitat of that race (*Bubalis cokei rothschildi*) is uncertain.

The race just mentioned is stated to be of a darker yellow-brown, with less tendency to red than the typical race, and with the thighs and hind-legs less distinctly whitish.

The following account of this species is abbreviated from one furnished by Mr. A. H. Neumann :—

"These hartebeests are found in wooded country, wherever the bush is not too thick and there are open glades to graze in, but are far more abundant on the grassy plains. In favourable situations of the latter type, as in Masailand, they sometimes congregate in large herds, often in company with zebras, and sometimes with gazelles. The range does not seem to overlap that of other species, except perhaps to the south, where this species is said to meet *B. lichtensteini* at no great distance from the boundary between British and German territory, extending into the latter as far south as Mpuapwa. Inland its nearest neighbour appears to be *B. neumanni*, whose range it approaches in the neighbourhood of Lake Naivasha. It is not found much west of the longitude of Naivasha ; but as to its easterly limit I am not clear, although I have not heard of it east of the Tana.

"In common with other members of the genus, which it resembles in its ungainly appearance and somewhat stiff but springy gait, this hartebeest is fleet and enduring, seeming, when put to speed, to spurn the earth with hardly an effort. The flesh is excellent, if the animal be in good condition ; the choicest, as in the case of all antelopes, being that of a large heifer. Within the limits mentioned Coke's hartebeest is the most widely distributed of all antelopes, being met with almost everywhere except in thick bush."

THE CAPE HARTEBEEST

(*Bubalis cama*)

Kama OR *Khama*, BECHUANA AND HOTTENTOT ; *Ingama*, MAKALAKA ; *Mchluzele*, ZULU

(PLATE iv, fig. 7)

This species is the hartebeest *par excellence*, having been so named by the old Cape Dutch on account of some fancied resemblance—perhaps its red coat—to a stag. It differs markedly from all the

foregoing species by the great elevation of the horn-pedicle and the V formed by the basal portion of the horns, which are sharply bent, at first forwards, and then backwards. The general colour is reddish brown, with the face (except between the eyes), chin, back of neck, shoulders, thighs and tail blackish brown, while the lower part of the rump has a conspicuous whitish or yellowish patch. The height ranges from about 48 to 54 inches, or even more; and the two longest pairs of horns measure respectively 25¾ and 26 inches.

The following account of this species—often called by the Boers rooi hartebeest, to distinguish it from the browner sassaby—is abbreviated from one given by Mr. H. A. Bryden in *Great and Small Game of Africa*:—

"Although individuals occasionally attain nearly 5 feet, the average height may be put at about 4 feet. In shape and appearance this hartebeest scarcely gives the idea of the extraordinary fleetness and staying powers for which it is remarkable; the humped and elevated withers, peculiar drooping quarters, and heavy elongated head somewhat belying its powers of galloping. The stout horns, which average about 20 inches over the curve, are strongly corrugated until near the points. Springing from a high and prolonged frontal ridge, they rise upwards for several inches, and then, bending slightly forwards, turn at an abrupt angle sharply back. Those of old bulls are strong and massive, and frequently a good deal worn and blunted at the tips; while those of cows are more slender. Hartebeests, even when wounded and at bay, seldom, if ever, use their horns against man; nor, if they did so, would these weapons, from their shape, be of much avail. Among themselves they may, however, be seen butting and fighting, often down upon their knees like a pair of rams. The eyes, set very high in the head, are reddish in hue, and from their position command a wide field of vision. The general colour is bright reddish brown, darkening considerably upon the back, where, in living specimens, it has a curious purplish sheen; while a noticeable patch of yellowish white marks the rump on each side of the tail. The face is black; dark streaks also occur on the outer side of fore and hind legs; and there is a tuft or whorl of hair on each side of the face just beneath the eye. The black well-tufted tail reaches below the hocks, and is remarkable for a reddish tinge if the hair be held towards the light and closely examined. The skin is in great demand among the Bechuana tribes for making cloaks.

"In former days hartebeests abounded in Cape Colony, where they ranged to the extreme south. At the present day [1900] they are only to be found south of the Orange river in the parched deserts of

Bushmanland, where a few troops are now and again encountered. In Natal they are now very rare, and only to be seen on certain farms, where they are carefully protected. North of the Orange river it may be doubted whether any hartebeests are to be found in the Orange River Colony; while in the western and northern Transvaal, where they were once abundant, they are extremely scarce. In Griqualand West, thanks to some measure of protection, they are, however, found sparingly in the wilder and more remote districts; while Bechuanaland and the eastern fringe of the Kalahari have always been most favourite resorts of these antelopes. Here, on the wide grassy plains, alternating with stretches of level, grassy, thinly forested country, hartebeests were exceedingly plentiful, and are still to be found, although naturally at the present day in numbers far fewer than of old. Still, even in British Bechuanaland, upon the eastern edge of the Lower Kalahari, fair-sized troops of these antelopes may now and again be encountered; while in Khama's country, especially the western portions, the deserts of the Kalahari, and the plains and salt-pans of the Botletli river, hartebeests exist in considerable numbers. The Mababi river and Lake Ngami form their limit to the north, as does the Serule river to the east.

"Seldom found in thickly bushed country, these antelopes frequent what may be termed typical Bechuana country, that is to say, wide grassy plains, alternating with open forests, where small patches of bush and forest trees offer shelter from the winds and frosts of winter and the blaze of the summer sun. In British Bechuanaland they seem to prefer the more park-like country to the open plains, probably for the reason that in such situations they more easily find shelter from the hunter. In Khama's country, farther north, they are more frequently seen on open grassy flats, near which they can find harbour among forest and thin bush. They are capable of existing for long periods—weeks, and perhaps even months—without drinking; some of the troops in the north Kalahari having little or no chance of finding surface-water during the rainless period of the South African winter, that is to say, in the months of June, July, and August. They are exceedingly fond of licking at the salt-bracks or pans, so common in South Africa; and, even in British Bechuanaland, where they are in much greater danger from night-shooting than farther north, will venture to do so night after night.

"When first disturbed and moving at a slow pace, hartebeests are deceptive; their drooping quarters, somewhat heavy aspect, and apparently sluggish action giving them a mule-like appearance, so that

the new-comer, viewing them for the first time, is by no means disposed to attribute to them the wonderful powers of galloping they actually possess. When really alarmed and put to it, their pace is, however, extraordinary ; they stretch themselves to their work, and with a long, free, machine-like stride, reel off mile after mile at great speed in a way that, in a long tail-on-end chase, bids defiance to the most gallant hunting-horse and the most determined rider. I have personally tested the fleetness and staying powers of these antelopes on several occasions, and am bound to confess that of all the plain-frequenting game with which I am acquainted, they are, in a fair gallop, the most difficult—nay, hopeless—to run down. On one occasion, in company with friends, I took part in the chase of a troop of hartebeests over the dry level plains, thinly spotted with camel-thorn trees, in the neighbourhood of the Maritsani river, in British Bechuanaland. We pushed this troop hard in a chase of at least seven miles on end, with the result that, while we ran our horses to a standstill, the hartebeests, although wheeling round occasionally to have a look at their pursuers, and thereby affording a few long-range shots, easily maintained their lead, and made their escape without the least apparent inconvenience. One of the party was, indeed, wounded and turned out of the troop, but it, too, succeeded in making good its retreat. On another occasion, on a wide open plain in the Kalahari country, not far from the desert-pool of Maqua, I tested the speed and staying powers of a good horse against some of these antelopes, with the result of the utter discomfiture of the horse and the easy escape of the hartebeests. Indeed, if the downfall of these animals depended upon a chase on horseback in fairly open country, few heads would fall to the hunter's rifle.

"But the hartebeest, although possessed of such fleetness and endurance, has its weak side. Like many other antelopes, it possesses great curiosity ; and even when hunted, a troop, if not pushed too hard, will wheel round suddenly and halt for a few moments to take stock of its pursuers. At such a moment the hunter, if not too far behind, can by means of a spurt get a fairly steady shot at two or three hundred yards' distance ; while a troop may be readily turned, like wildebeest and other game, by firing a bullet or two so as to strike up the sand in front. Occasionally, too, if the leader of the troop be killed, or wounded and turned from its fellows, the rest of the herd will become bewildered, and run hither and thither, so that the hunter may obtain a shot. Then, again, in the open forest country of much of Bechuanaland, these antelopes, if carefully tracked and approached with caution, may be found resting, when comparatively easy shots may

sometimes be obtained. In this country, too, a mounted man, hidden by the giraffe-acacia groves, and knowing that the game will almost invariably make up-wind, is enabled to cut off corners and come up with the troop even when running; and I have cut a troop completely in half in this way, and seen its members standing at 150 yards' distance for a few moments completely bewildered, thus affording a steady shot. Still, it must be confessed that hartebeests are extremely wary antelopes, possessed of marvellous powers of scent and hearing, so that, on the whole, they have managed to maintain their ground against the hunters, at least as well as most other South African beasts of chase—far better, in fact, than a good many; the desert nature of much of their habitat having, no doubt, aided them in prolonging the unequal struggle against the advance of civilisation. No antelope is more tenacious of life, or will more often succeed in running long distances, and even making good its escape, when carrying the most severe wounds.

"The average number in a troop ranged from a dozen to fifty, although occasionally eighty or a hundred might be seen together. The cows generally calve from September to the end of November.

"The flesh of the hartebeest, although dark in colour, is fairly good, although not comparable to that of springbok, eland, or klipspringer. It is used a good deal as *biltong*, and in that form (cut into strips, slightly salted and sun-dried) is very palatable; and hartebeest-stew is by no means bad."

THE LELWEL HARTEBEEST

(*Bubalis lelwel*)

Titel, SUDANI; *Mangazi*, WAGANDA

(PLATE iv, fig. 8)

Having the same long face as the Cape species, this hartebeest is distinguished by the taller horn-pedicle, the somewhat less abrupt backward bending of the horns, and the lighter and redder colour. The typical race (*Bubalis lelwel typica*) inhabits the Bahr-el-Ghazal, Upper Nubia, and Kordofan, and has a dark face-blaze, which is wanting in the other races. Of the latter, the White Nile race (*B. l. niedecki*) differs from the one mentioned next by the tips of the horns being parallel or inclining slightly inwards. It inhabits the eastern Sudan, on the White Nile. The Baringo, or Jackson's, race (*B. l. jacksoni*), from the interior of British Central Africa and the district north of Lake Baringo,

is wholly of a bright foxy red, with the tips of the horns turned outwards. It stands about 52 inches at the shoulder, and is estimated to weigh about 450 lb. From the Maanja river district in Uganda, about thirty miles from Kampala in the direction of the Albert Nyanza, has been described a hartebeest differing from normal examples of *jacksoni* by its more tawny colour and the presence of a distinct black dorsal stripe and black markings on the limbs; these markings being confined to the knees and hocks and the parts below them. This Maanja hartebeest is at present known only by a single specimen, of which the head is exhibited in the British Museum, Natural History. If it prove to be a distinct race, it should be known as *B. l. insignis*.

FIG. 32.—Head of White Nile Lelwel Hartebeest, from Mr. Niedeck's *Mit der Büchse in fünf Weltteilen*.

Writing of the race named after himself, Mr. F. J. Jackson states that of all the hartebeests found in East Central Africa this is certainly the largest and finest, while it has also the ugliest and longest head of all. It is widely distributed, being found from that part of Masailand lying between Lakes Elmeteita and Nakuru for some forty miles to the north, and then eastward to the Nile valley. It has also been seen on the Laikipia plateau, east of the Lorogi Mountains.

"The headquarters of these hartebeests are," he continues, "undoubtedly the Mau plateau and Turkwel. On the rolling grassy downs of the former they are very common from about 8000 to 5000 feet. Wherever found, they may be seen in herds of four or five up to forty or fifty and sometimes more, also single bulls quite by themselves. If

asked whether they are difficult to stalk, I should say that it depends a good deal on the time of year, as they are certainly much more difficult to approach from December to April, when the grass has been burnt and affords little or no covert. In July and August they are quite easy to approach, as the grass is at that time long and still green; and it then generally amounts to stalking only one of them, the sentinel. No animal knows better how to take advantage of the innumerable ant-heaps that are scattered all over the country it frequents, and the sentinel of the herd, whether the members are scattered about feeding or lying down, almost invariably takes up its post on one of these hills."

On one occasion Mr. Jackson observed five sentinels on a single ant-hill, which utterly prevented a successful stalk. The cows usually drop their calves from February to April, although a few seem to calve at any season. A bull shot by the same gentleman stood 4 feet $3\frac{1}{2}$ inches at the withers, and weighed 405 lb.; while a cow measured 4 feet and half-an-inch, and weighed 341 lb.

NEUMANN'S HARTEBEEST

(*Bubalis neumanni*)

(PLATE iv, fig. 4)

Considerable doubt has been, and still is, entertained as to whether this hartebeest is entitled to rank as a species, since it presents characters to a great extent intermediate between those of the lelwel and the kongoni. Mr. O. Neumann (*Sitzungs-Berichte Ges. Naturfor. Berlin*, 1907, p. 247) is of opinion that the specimens ordinarily referred to *Bubalis neumanni* are hybrids of this nature, since they come from districts like the Mau plateau and Lake Baringo on the borderland of the habitats of *lelwel jacksoni* and *cokei*. On the other hand, specimens from near Lake Rudolf, the type locality, may be distinct. In the specimens commonly referred to this form the horns of the bulls extend at first outwards, almost at right angles, and then incline inwards, while they are ringed nearer to the tips than in *B. lelwel*. The general colour is yellow-fawn, deeper on the back, and much paler below, but the chin and tail-tuft are, as usual, black. Cows are duller and lighter in colour than bulls. The shoulder-height is from about 48 to 50 inches.

Mr. A. H. Neumann, the discoverer of this hartebeest, writes that

it "must apparently be a very local species, which is probably the reason why it has not been obtained by other travellers. I met with it at the far north-eastern corner of Lake Rudolf, in one locality only, and the natives there did not seem to know of it elsewhere. I saw a small herd of cows and young with one big bull, and one or two odd bulls apart. It may or may not have been the same troop which was met with on different occasions. I came across them accidentally when hunting elephants, and recognised them as something new to me. They frequented a tract of fairly open bush-country, some little

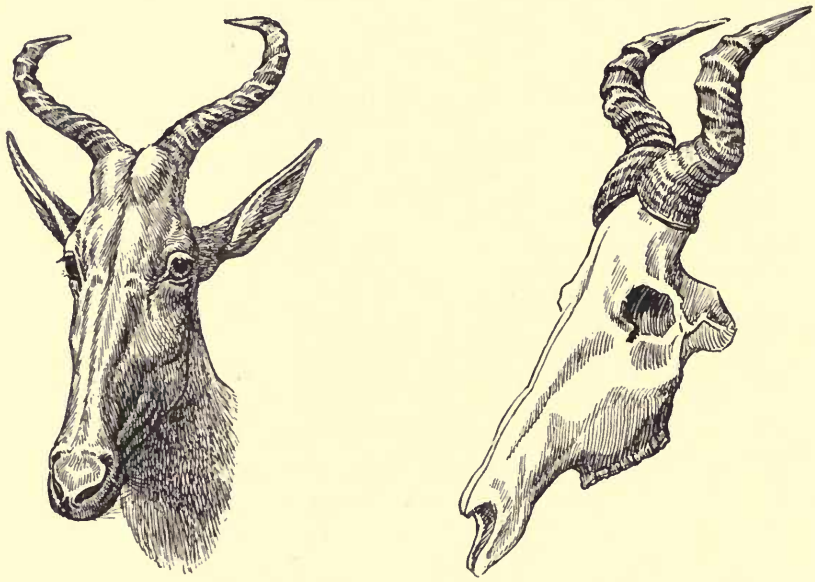


FIG. 33.—Neumann's Hartebeest, head of female and skull and horns of male.

distance back from the lake-shore, where the ground rises gently in dry gravelly ridges covered with more or less scattered scrubby bush. Owing to my being laid up during most of the time that I was in the neighbourhood of the locality where I saw this antelope, and the area being so circumscribed and not easily accessible to me while weak, I was unable to study the species as much as I should have liked, and I considered myself lucky to obtain the specimens I brought home, for those I saw were by no means easy to get near.

"This is the only true hartebeest found in the region where I met with it. With the exception of the topi, which belongs to a different genus, there is no other hartebeest within several hundred miles. The

nearest point, so far as I know, where a congener occurs is at the western base of the Lorogi Mountains, where Jackson's hartebeest has the extreme limit of its range. Coke's is still farther away."

THE KONZI OR LICHTENSTEIN'S HARTEBEEST

(*Bubalis lichtensteini*)

Inkulanondo, MASHONA; *Konzi*, MASUBIA, CHILALA, AND CHIBISA; *Koko-Tombwi*, BAROTSI; *Godonko*, ZAMBESI

(PLATE iv, fig. 9)

With the konzi, or Lichtenstein's hartebeest, we come to a species easily recognised by the form of the horns. These are mounted on a short and wide pedicle, and are much flattened at the base, and strongly curved inwards below the terminal backward inclination; their rings, which extend nearly to the tips, are also but slightly elevated on the basal portion. The general colour is yellowish tawny, tending to a more decided rufous hue on the back, with the chin, the fronts of the lower portion of the legs, and the tail-tuft black. The shoulder-height is from about 50 to 52 inches, and the weight has been given as about 300 lb. East Africa, north of the Sabi river, throughout Nyasaland and Mozambique to Usagara, forms the range of this species.

Mr. Selous observes that "this fine antelope, whose range is now known to extend over large areas of country to the north of the Zambesi in Central and East Central Africa, as well as over a considerable part of South-East Africa to the south of that river, was first discovered by the German naturalist, Dr. Peters, in the neighbourhood of Sena on the lower Zambesi, and by him named after his compatriot, the traveller Dr. Lichtenstein. South of the point where Dr. Peters first met with it, this hartebeest is found throughout the greater part of the low-lying coast-country between the Zambesi and the Sabi, and although its range has not been accurately determined in this direction, it probably extends into certain districts of the country to the south of the lower course of the latter river. The species is fairly common on both sides of the central and upper course of the Sabi river, as far north as a point some 50 miles south of Mount Wedza, and from there eastwards may be met with to within a few miles of Massikessi. Westwards from the central Sabi a few stragglers range as far as and even beyond the Lunti river, while in

1885 a small herd of six suddenly appeared in northern Mashonaland, near the Hanyani river, some 20 miles to the north-west of where Salisbury now stands. This is the more remarkable, since the natives of that part of Mashonaland are unacquainted with this hartebeest, for which they have no name in their own language. This proves, I think, that it could never have been indigenous to that part of the country.

"Only one of these six stragglers was shot—a female, of which the skull is now in the British Museum (Natural History)—and the rest must have made their way back to the country whence they came—probably the neighbourhood of the Sabi river. Throughout the greater part of the country in which I have travelled to the north of the Zambesi, I have met with Lichtenstein's hartebeest; and it is one of the commonest antelopes on the table-lands lying between the Zambesi and the Kafukwi, as well as all over the country to the north of the latter river, which is where I first met with it in 1877-78.

"At that time very little was known concerning this hartebeest, and, with the exception of the two type specimens at Berlin brought by Peters from the lower Zambesi, it was unrepresented even by so much as a skull in any European collection. There are now, however, in the Natural History Museum, two mounted specimens—male and female—as well as several skulls. The horns, though similar in general characters to those of the Cape hartebeest, are much shorter, and instead of being rounded at the base are broad and flat. The black mark down the front of the face of the Cape species is entirely wanting in this hartebeest, in which the colour of the head and face is uniform yellowish red, with the exception of a black patch on the extremity of the under jaw. In the adult Lichtenstein's hartebeest the shoulders, back, and upper part of the neck and sides are of a rich dark chestnut-red colour; the head, the sides of the neck, and the lower part of the sides being much lighter. As in the Cape hartebeest, there is a patch of pale yellow on the rump, and the insides of the thighs and belly are also pale yellow. The upper part of the tail, knees, and fronts of all four legs are black. An adult male shot in the Manica country to the north of the confluence of the Zambesi and Kafukwi rivers had a patch of dark grey, about 6 inches in diameter, about a hand's breadth behind each shoulder; and a female from the same part of the country also showed similar grey patches, although in two other full-grown males shot in the same locality they were wanting. I have not observed them in any of the specimens subsequently shot near the Sabi river or in the neighbourhood of the Pungwi.

"These hartebeests are usually met with in small herds of from five or six to a dozen individuals, and I doubt if I have ever seen more than twenty together. They are never found amongst hills, nor have I come across them in thick scrubby bush.

"Like other hartebeests with which I am acquainted, this species seems to prefer open to forest country; it is partial, for instance, to the wide open downs to the north of the Zambesi, and when in country where patches of thin forest alternate with broad open glades, will nearly always be met with in the latter kind of ground. These hartebeests are wary and keen-sighted, and when suspicious of danger will often climb to the top of one of the ant-hills so common in south-east Africa, and survey the surrounding country from this point of vantage. When thus standing on the look-out, they hold their tails slightly raised, and if anything excites their suspicions they will watch it without making any movement for a long time, but gallop off directly the suspected object attempts to approach. When pursued on horseback, they go off at a light springy canter, and if not pressed will soon stop, when, turning broadside-on, they stand gazing intently at the approaching horseman. After a shot or two has been fired, they will, however, probably commence to gallop in real earnest, when they will be found to be fleet and enduring, like the Cape hartebeest and the tsessebe. In the districts where I have met with Lichtenstein's hartebeest to the south of the Zambesi, tsessebe are also found, and I have seen a single tsessebe feeding with a small herd of the hartebeests, and, on another occasion, an individual of the latter species accompanying a herd of the former. Like other South African antelopes, Lichtenstein's hartebeest calves during the months immediately preceding the commencement of the rainy season, usually in October and November. The flesh is good, but ought to be fried or roasted with bacon or the soft lard of the elephant or hippopotamus, as its own fat is hard, and, as soon as it begins to cool, clogs on the teeth and mouth."

The following are the dimensions, in inches, of a bull and cow shot by Mr. Percy Rendall:—

	Male.	Female.
Nose to tail	$91\frac{1}{2}$	$87\frac{3}{4}$
Height at shoulder	$52\frac{1}{2}$	$50\frac{1}{4}$
Length of tail	$26\frac{1}{4}$	26
,, ear	$9\frac{1}{2}$	$9\frac{1}{2}$
Point of shoulder to nose	30	30

The last-named sportsman states that new-born calves are dun-brown in colour with a black dorsal stripe, but no trace of the light

rump-patch. As a similar dorsal stripe occurs in the young of one of the species of gnu, it is probable that the adult of both hartebeests and gnus were originally marked in this manner, and that the occurrence of a dorsal stripe in one variety of the lelwel hartebeest (p. 108) is thus a reversion to the ancestral type.

THE HEROLA OR HUNTER'S HARTEBEEST

(*Damaliscus hunteri*)

Herola, GALLA; *Aroli*, SOMALI

(PLATE v, fig. 1)

With this species we come to a group of antelopes close akin to the more typical hartebeests, from which they are distinguished by the shorter face, the absence of a distinct horn-pedicle, the want of a sudden angulation in the horns themselves, which generally form a simple curve, and the less marked elevation of the withers and falling-away of the hind-quarters. The species may be arranged in the following three groups:—

A.—Horns doubly curved, at first directed upwards and outwards, then bending slightly downwards, after which their long smooth tips again point upwards.

Herola, or Hunter's Hartebeest.

B.—Horns curving regularly backwards or slightly lyre-shaped, with only the short tips recurving upwards.

Korrigum, Topi, or Tiang.
Bontebok.
Blesbok.

C.—Horns at first inclined outwards, with a single crescentic curve upwards and backwards.

Tsessebe or Sassaby.

Standing about 48 inches at the withers, the herola, which ranges from southern Somaliland to the north bank of the Tana river, is sufficiently distinguished from the other members of the group by its long doubly-curved horns. Its general colour is rufous fawn, much like that of Coke's hartebeest, but the forehead has a distinct white chevron, with the angle directed upwards, and the lower half of the tail is white. The horns are heavily ringed for the first twelve

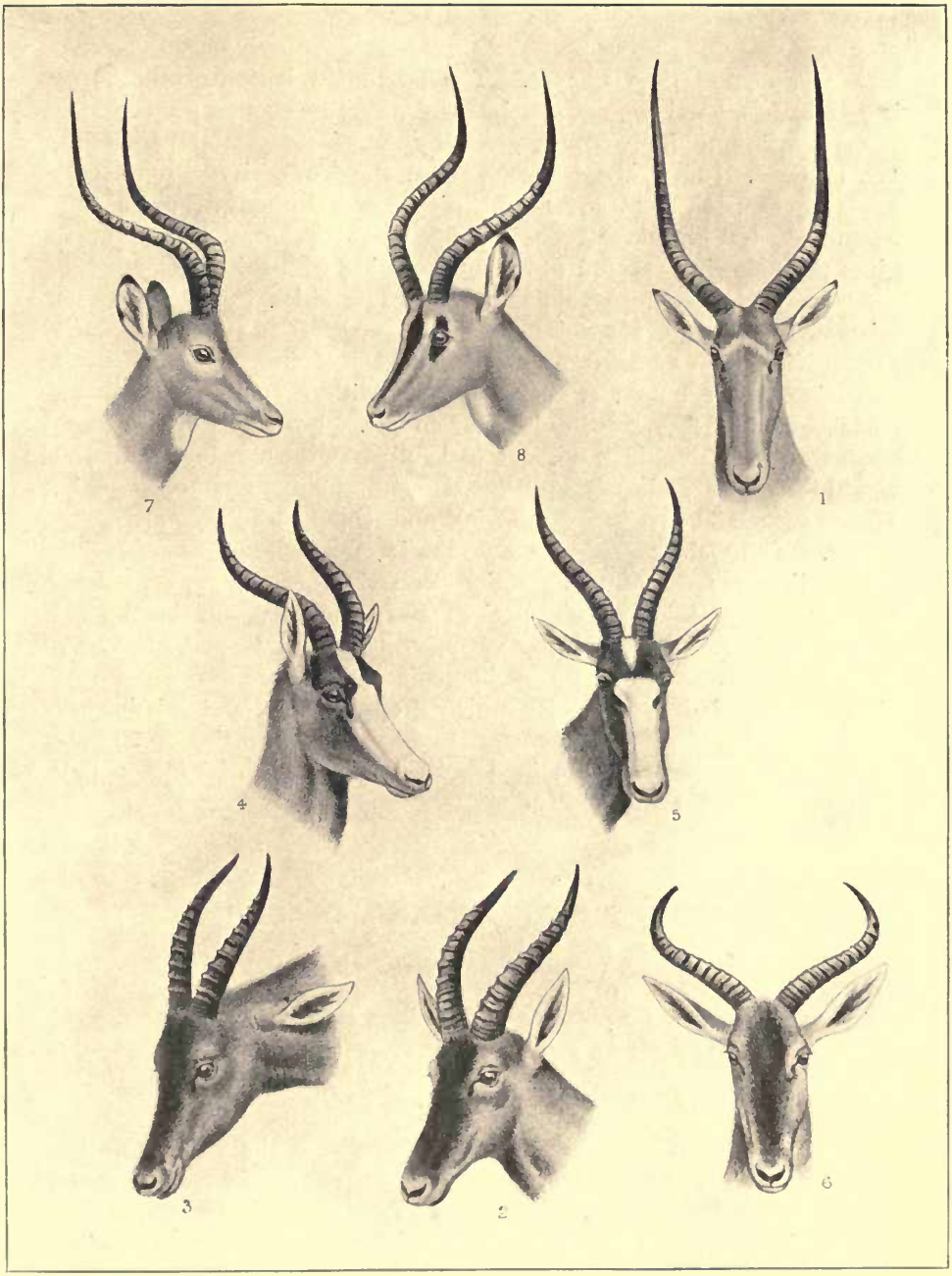


PLATE V

1. Hunter's Harteboest.
2. Korrigum.
3. Topi.
4. Bontebok.
5. Blesbok.
6. Tsessebe or Sassaby.
7. Pala.
8. Black-faced Pala.

inches or so, and then smooth. The maximum length of the horns is 26½ inches, good average specimens running to about 25 inches.

According to the account given by the discoverer of the species, Mr. H. C. V. Hunter, these antelopes on the Tana river associate in herds of from ten to twenty head, which frequent open plains and thin thorn-bush, but are never seen in thick scrub or forest. Mr. Hunter gives the following account of his first meeting with this species:—

"I saw two antelope coming towards me, which in the distance I mistook for impala, a species not found up the Tana, but common round Kilimanjaro, and it was not until I had fired at one of them and missed that I saw, as they ran away with a heavy gallop like a hartebeest, that they were quite new to me. I set to work to track them through the thin bush, and had followed them a long way and was thinking of giving it up when I spied them on an open plain. They saw me at the same moment and commenced to walk away slowly. The plain was so bare and devoid of long grass that stalking or crawling was out of the question, so I risked a run towards them as they were walking slowly straight away from me, and luckily got nearly within 150 yards before they stopped and turned, offering a broadside-shot. Sitting down immediately I fired off my knees, hitting one behind the shoulder, which dropped dead, and missing the other. The one bagged turned out to be a young male; but in the course of a few days we obtained several specimens, of which a pair are mounted in the British Museum."

THE KORRIGUM, TIANG, OR TOPI

(*Damaliscus corrigum*)

Korrigum, BORNOW; *Derri*, HAUSA; *Tiang*, BAHR-EL-GHAZAL; *Topi*, BRITISH EAST AFRICA; *Korki*, GALLA; *Mangazi*, WAGANDA

(PLATE v, figs. 2, 3)

Typically a West African species, known to the natives as the korrigum, this antelope is represented on the eastern side of the continent by local races, of which tiang and topi are the native designations. As these races were originally regarded as distinct species, their native names have come into general use, although it would have simplified matters had they been respectively called the Bahr-el-Ghazal and the East African korrigum; when the typical

race would have been termed the Senegal korrigum—a better title than Senegal hartebeest, as it used to be always termed.

Using the name korrigum in a wide sense, so as to include the tiang and topi, this antelope may be defined as a large red-coloured species of *Damaliscus* characterised by the single curve of the heavily ridged and slightly lyrate horns, the presence of a blackish blaze on the face, and (usually) similar patches on the upper part of the fore-legs, hips, and thighs, which extend in the form of a garter on the inner sides of the limbs above the knees and hocks. The tail-tuft is black. The height is from 48 to 50 inches.

In the typical korrigum of Senegambia and the interior of West Africa (*Damaliscus corrigum typicus*), the general colour is a rich full red ; the black markings are strongly pronounced, and include a black streak given off from the face-blaze running upwards and outwards below the eye ; the lower portions of the legs appear to be coloured like the body, and the tail-tuft is large. The hair has a silver-like gloss, giving it a kind of "watered-silk" appearance.

FIG. 34.—Head of Topi, from a specimen shot by Mr. A. H. Neumann.

The tiang (*D. c. tiang*), of Sennar, Kordofan, and the Bahr-el-Ghazal, appears to differ from the last by the larger amount of black on the inner side of the limbs, and the bright tan-colour of their lower portions.

The Uganda tiang (*D. c. selousi*) is distinguished by the bright tan or chestnut colour of the muzzle and of the area around the eye above the dark eye-stripe.

The desert tiang (*D. c. jonesi*), of the upper Sudan, which is stated to inhabit dry sandy tracts in place of swamps, is a plumper and browner antelope than the true tiang, with no dark eye-stripe, and, it is reported, no dark markings on the limbs.

The topi (*D. c. jimela*), typically from the Juba district of British East Africa to the Sabuki river, ranging thence to Uganda and Uniamwezi, and also occurring near Lake Rudolf, appears to differ from *D. c. typicus* by its browner colour, the absence of the dark eye-stripe, and the smaller tail-tuft. Dr. P. Matschie, by whom it was named, describes this race as follows :—Colour dark reddish brown, with a silk-like bluish-grey gloss ; shoulders and thighs with blue-black patches ; forehead and nose blackish brown ; no dark stripe running from the frontal blaze below the eye ; under-parts bright cinnamon ; tail-tuft small. Dark markings absent in the young. Horns lyre-shaped, with their tips inclining backwards and inwards. The shoulder-height is about 50 inches, and the weight is stated to range from 250 to 380 lb.

A topi (or tiang) from the upper Congo appears to connect *D. c. typicus* with *D. c. jimela*, having a faint vestige of the eye-stripe, and being a much browner-coloured—almost tan-brown—animal than the korrigum, so far at least as can be gathered from the description and plate of the latter in the *Book of Antelopes*. This Congo topi, of which a mounted specimen shot by Major Powell-Cotton is in the Museum at Tervueren, near Brussels, has the small tail-tuft characteristic of the eastern topi.

Our knowledge of the true korrigum, which is represented in the galleries of the British Museum only by the horns, is very incomplete. It was named in 1836 on the evidence of horns brought from Bornow by Messrs. Denham and Clapperton on their return from the Nigerian expedition of 1822-24 ; and in 1840 specimens were living in Lord Derby's menagerie at Knowsley, where they bred. Two of these are exhibited at Liverpool.

The races from Central and East Africa are much better known, and are represented by complete mounted specimens and heads, as well as skulls and horns, in the exhibition galleries of the British Museum (Natural History). Tiang, it appears, means in Swahili mud ; and these animals, with the exception of the desert race, are inhabitants of swamps and morasses. The desert race, on the other hand, according to information furnished to the author by Sir Robert Harvey, inhabits dry sandy tracts, where it lives for months without water, procuring such liquid as it requires by eating water-melons.

The following notes on the topi are abbreviated from an account furnished by Mr. A. H. Neumann :—

" In East Africa this antelope occurs quite near the coast and also far in the interior, but there are wide regions where it is unknown, separating the various parts of its range. I met with it in small

numbers many years ago on the western edge of the great Mau forest (near that part called the Mau Nyarok or Black Mau), just south of Sotike and Lumbwa, and I have little doubt that it may range down to the Victoria Nyanza, at the part of its coast south of Ugowe Bay, although we saw none in Kavirondo nor anywhere along the north coast of that lake. Mr. F. J. Jackson states that it is the commonest antelope in the Gala country near the coast, and that he has met with a few on the Mau plateau and down the Nyando river to near the Victoria Nyanza, and that it also ranges round the north of Mount Elgon into Uganda, Budu, and Toru, on which side of the lake it is common. It is, however, unknown throughout the extensive region lying between the coast-belt and Lake Rudolf; and I met with no signs of it after leaving the neighbourhood of the coast until I reached the Bay of Lalia, half way up the east side of that lake. It was on this northern half of the east coast of Lake Rudolf that I became intimately acquainted with this antelope, and especially towards the north-east corner, where I met with it in immense numbers.

"It appears that this antelope has a special predilection for the vicinity of large bodies of water, although it may be found some considerable distance away from the actual shore. Thus it occurs not far from the sea, from the neighbourhood of Mbungu, a short distance inland from Mombasa, northwards, but, I think, nowhere on the coast to the south of that latitude, and reappears in the neighbourhood of the inland lakes. In the neighbourhood of Reshiat is a broad level valley behind, overlooked by a ridge, where the topi used often to collect towards evening or in the early morning. They were sometimes literally in thousands, the flat for a mile or more being covered with them, collected in one enormous herd. During March all the cows seemed to have calved, and I used to enjoy watching the gambols of the troops of light fawn-coloured calves racing fleetly up and down, and chasing each other in and out among the herd. Once or twice I had the opportunity of witnessing a fight between two bulls. Between the rounds they stood a little apart, pretending, as it were, to take no notice of each other; then suddenly, as if instinctively impelled by some simultaneous impulse, they rushed together, going down on their knees as their heads clashed. At night the topi used to come quite close to my camp, and I have seen their footprints in the morning within fifty yards of my hut, and often heard them grunting and sneezing in the night.

"The flesh of the topi is excellent, being about the best meat furnished by any antelope found in this part of Africa, just as that of

its relative the bastard-hartebeest or sassaby is esteemed for its superiority in that respect by the natives of South Africa. The animals seem, moreover, to be generally in good condition, for all that I shot were very fat. This antelope seems to be among the species which are purely grazers, living, so far as I was able to observe, on grass and other herbage to the exclusion of leaves, etc. It affects the open plains near Lake Rudolf, but also wanders through the more open parts of the bush; and in Sotike I found it frequenting swampy glades on the borders of the forest. In Reshiat, at all events, it is not ordinarily difficult to get within range of the topi; and I could generally obtain one or two whenever I wanted, and on one occasion killed two with one bullet.

"As in the case of all gregarious animals, the strongest males drive out their weaker brethren from among the herds of cows; and these vanquished bulls congregate in separate herds, or sometimes a sullen old bachelor is found alone or associating with a herd of Grant's gazelles. The El Gume natives trap them with an ingenious snare, which is made from twisted strips of hide, laid up exactly like the 'neck-strop' used to yoke bullocks in South Africa, with a running noose at each end. A contrivance like a little wheel without a nave, with an inordinate number of spokes (sharpened at the end pointing to the centre), is placed over a circular hole dug in a path or crossing much frequented by game, and on the outer edge of this the loop of one end of the snare is laid, a log being attached to the other. On an antelope treading on this trap (which is covered over with grass, etc.) its foot goes through the centre of the wheel, when the converging spokes hold fast to its fetlock, preventing the noose from slipping off until the latter is drawn tight. Then the topi starts off with the log dragging and bumping beside or behind it, alternately making short bursts and turning to face the log, which it cannot shake off, until, tired out, it falls an easy prey to the trapper.

"The herds used to come down in the evening or during the night to drink at the lake; and it was in their paths leading to the water that these snares were often set. I have seen the Reshiat natives trying to cut them off when a large herd had approached the shore and chasing them with their spears, but they never seemed to kill any; and, indeed, they are such poor hunters that the topi may sometimes be seen in the early morning feeding quite close to their kraals, having apparently little fear of them.

"The horns of my best male specimen measure 19 inches along the front curve."

The record horn-length for the typical korrigum is $26\frac{3}{4}$, for the typical tiang $25\frac{7}{8}$, and for the topi $22\frac{1}{4}$ inches.

THE BONTEBOK

(*Damaliscus pygargus*)

Bontebok, CAPE DUTCH

(PLATE v, fig. 4)

With the beautiful antelope known to the Boers of South Africa as the bontebok (that is to say, the pied or painted buck) we come to two closely allied species easily distinguished from all other members of the hartebeest group by the presence in the adult of a conspicuous white blaze on the front of the face. Whether the two animals should be regarded as races of one species, rather than distinct species, may be open to argument.

Standing about 40 inches at the shoulder, and weighing somewhere about 200 lb., the bontebok is specially characterised by the white blaze, although narrowing suddenly just above the eye, being continuous throughout the whole length of the face, from the muzzle to the bases of the horns, by the conspicuous white rump-patch, which includes the upper surface of the basal half of the tail, and by the absence of yellow on the ridges of the horns. The dark portions of the coat have a peculiar gloss, like the "bloom" of a plum. In colour the fore part of the back is rufous fawn, which darkens into blackish near the rump, as well as on the shoulders, flanks, and the front of the limbs, while the tail-tuft is wholly black. In addition to the areas already mentioned, the under-parts and much of the hind surfaces of the limbs are white.

The range of the bontebok appears to have been restricted to the plains of Cape Colony in the neighbourhood of Cape Agulhas, and, in spite of statements to the contrary, never extended north of the Orange river. The species exists at the present day only on the farm of Mr. Vander Byl, near Swellendam, in the south of Cape Colony.

There are two groups of African antelopes, widely separated geographically, which present the unusual feature of having the backs of the ears white, and the general body-colour dark relieved by patches of white on the head, and generally on the buttocks, in the adults of at least one sex. The first group is represented by the bontebok and blesbok, and the second by the white-eared kob and Mrs. Gray's kob of

the White Nile. The two groups differ by the circumstance that while in the former this type of specialised colouring is common to the adults of both sexes, in the latter it is restricted to a few old bucks in each herd. Closer examination will reveal certain other striking differences. In the bontebok, for instance (although not in the blesbok), there is a large white rump-patch, while that part of the tail which overlies this patch is also white externally, the lower portion and the whole of the inferior surface being dark. In the adult bucks of the two Nile species, on the other hand, only the inner sides of the buttocks and the inferior surface of the tail are white. Obviously, there must be some good reason for both the resemblances and the differences. In both instances the white on the ears and rump is probably intended to serve as a guide to the members of the herd in flight. From the fact of the special colouring only occurring in a certain number of old bucks of the Nile group, it would appear that these individuals take the lead when the comparatively small herds are in full flight. On the other hand, in the incomparably larger herds of the bontebok a few such individuals would be altogether lost, and consequently both sexes have donned the special colouring.

In young bonteboks (and blesboks) the face-blaze is blackish, as in the adults of several other members of the hartebeest group; and in a full-grown buck of one of these species recently living in the Berlin Zoological Gardens the blaze never turned white.

The following admirable account of the bontebok is condensed and otherwise slightly modified from one furnished by Mr. F. C. Selous:—

"The first Dutch settlers at the Cape of Good Hope met with a richly coloured species of antelope in the neighbourhood of Cape Agulhas which they named the bontebok—pied or variegated antelope; and it was more than 100 years later that the nearly allied species known as the blesbok was first encountered on the high open plains to the south of the Orange river in the present Colesberg division of Cape Colony. These blesboks were, however, at first called bonteboks, and the plains over which they once roamed are known as 'bontebok-flats' to this day. When the Boers crossed the Orange river in 1836 and trekked into the plains of what is now known as the Orange River Colony, they met with immense herds of blesboks, but saw no bonteboks. They, however, confused the two species; those who had some acquaintance with or knew something about bontebok calling the new species by the old name, while the majority (who had never seen or heard of bonteboks) gave it the name of blesbok—from the broad white blaze down the face. A confusion thus arose between

bonteboks and the blesboks, which caused Cornwallis Harris to believe that both occurred north of the Orange river.

"One reason why I consider it impossible that bonteboks and blesboks could have co-existed in the same district is because the two are so closely allied that they would inevitably have interbred and become fused into a species more or less intermediate between the two. There is not more difference between the bontebok and the blesbok than between the whole-coloured eland of south-western Africa and the striped form of the same species found all over south-east Africa; while the difference between the two former animals is less than that between the variegated form of bushbuck found on the Chobi river and the dark race of the same species inhabiting the coast-region of Cape Colony. The difference is that in the case of the eland and the bushbuck the extremes are connected by a series of links, which can only be looked upon as local variations from the type form. If all the varieties of the bushbuck which exist in south-east Africa, and connect step by step the dark brown and almost spotless form found in the Cape Colony with the variegated race met with on the banks of the Chobi, had been exterminated before the advent of Europeans, leaving only the two widely different forms, there can be little doubt that the bushbuck of the Chobi and that of Cape Colony would have been considered distinct species. In the case of the blesbok and the bontebok the connecting links have been lost. It is not improbable, I think, that the blesbok once ranged right through Cape Colony to the coast at Cape Agulhas, but that the gradual desiccation of the Karoo in the south-western portions of the Colony—of which there is a good deal of evidence—or several years of continuous drought, caused the withdrawal of the species from the parched and waterless Karoo. Those which had reached the plains near Cape Agulhas, where there is plenty of water, would, however, have had no reason to move, and thus a portion of the race may have become isolated, and in course of time differentiated from the original stock.

"In general appearance bontebok and blesbok bear the closest resemblance to one another, being, as Harris long ago remarked, 'equally robust, hunch-backed and broad-nosed, and rejoicing in the same whimsical and fine venerable old-goatish expression of countenance.' The bontebok is, however, slightly larger and heavier than the blesbok: the male specimen of the former now in the galleries of the British Museum, a fine full-grown animal in good condition, weighed exactly 200 lb. as it lay, while the male specimen of the latter—also a fine animal of its kind—weighed 180 lb. as it lay and

135 lb. clean. Two other bontebok rams—apparently full-grown—shot at the same time as the above-mentioned specimen, weighed respectively 166 lb. and 160 lb. as they fell. From these data I infer that though an exceptionally fine blesbok will weigh more than an ordinary bontebok, yet the heaviest bonteboks will outweigh the heaviest blesboks. The horns in both species attain a length of about 16 inches in males; those of females, though nearly as long, are much slighter.

"The bontebok, having always been confined to a small area of country, would probably have been exterminated early in the last century had it not been protected by the Cape Government. Sir Cornwallis Harris states that at the time of his visit to South Africa in 1836-37 a fine of 500 rix-dollars (£37 : 10s.) was attached to the destruction of one of these animals without a special license from Government. In spite of stringent laws there can, however, be no doubt that many bonteboks were annually killed, and, had it not been for Mr. Alexander Vander Byl, this fine antelope would probably have vanished long ago from the face of the earth. In 1864 this gentleman, when enclosing with a wire-fence his domain, known as Nachtwacht Farm, near Bredasdorp, conceived the idea of driving all the bontebok on the neighbouring plain within the enclosure. Circumstances favoured him, and he was able, by a piece of good fortune, to drive the greater number of the bonteboks still alive into the enclosure. He put the number thus secured at something like 300, and his nephews believed in 1898 that there had been little increase or decrease in their number since that date. I may not have seen all, but it certainly did not appear to me that there was anything like 300 bonteboks on the enclosed ground at the date of my visits in 1895 and 1896. Mr. Vander Byl's example was followed by one of his neighbours, Dr. Albertyn, who at that time also had a small herd of bontebok on his farm. Besides these carefully protected herds, there were a few surviving on the plains outside the enclosed farms, both in the neighbourhood of Bredasdorp and near Swellendam.

"In habits the bontebok is precisely similar to the blesbok. The calves are dropped in September and October, and, as with most other African antelopes, gain strength so rapidly that when a week old they cannot be run down by an ordinary shooting-horse. Bontebok no doubt once congregated in vast droves. Those on the enclosed farms near Cape Agulhas associated in small herds of from half-a-dozen to twenty or thirty individuals. Though not very wild, they would not allow any one to approach on foot within 300 yards, though they would

often permit a cart and horses to be driven much nearer before taking alarm. They seemed, indeed, to know that no danger was to be apprehended from outside the fence, for I saw three stand and calmly watch a cart which was being driven along the road outside the fence within 100 yards of them. When alarmed, they ran against the wind with great speed and endurance, and when pressed lay flat to the ground, with their heads held so low that their noses appeared almost to touch the grass."

THE BLESBOK

(*Damaliscus albifrons*)

Blesbok, CAPE DUTCH; *Noni*, BECHUANA AND BASUTO; *Inoni*, KAFIR

(PLATE v, fig. 5)

The blesbok, which stands from 40 to 42 inches at the shoulders, differs from its cousin the bontebok by the presence of a brown line between the eyes dividing the white frontal blaze, the absence of a white rump-patch, the wholly brown tail, and the yellowish summits of the rings on the horns; the horns themselves also showing a greenish tinge, instead of being entirely black. The record horn-length is $18\frac{1}{4}$ inches.

The species, now on the verge of extermination, formerly inhabited the northern plains of Cape Colony, the Orange River Colony, the Transvaal, Griqualand West, and Bechuanaland in herds comprising thousands of individuals. According to Mr. H. A. Bryden, the northern limit of the blesbok's range appears to have been practically formed by the Molopo river, which is mainly the frontier of British Bechuanaland; neither does the species seem to have ranged in Bechuanaland very far to the westward of the Transvaal border. This is the more remarkable seeing the physical character of the adjacent Kalahari desert is very similar to that of much of British Bechuanaland. A similar circumscribed and apparently capricious distribution appears to have obtained in the northern plains of Cape Colony, where there is no evidence that the species ever wandered much to the westward of the Colesberg district. From the Cape, blesboks appear to have vanished some forty years ago; and about the time of the South African war they were remaining, chiefly in a partially protected condition on farms, in certain parts of the Orange

River Colony, the southern Transvaal, and British Bechuanaland. In the last-named state they were, however, still to be found in a purely wild condition at least up to the year 1882.

On the protected farms blesbok are now usually shot with the aid of a stalking-horse; and even in the days of their abundance they were difficult game to approach.

Writing in 1837 of the blesbok on the Vet river, a tributary of the Vaal, in the Orange River Colony, Sir Cornwallis Harris observes: "We passed over a low tract about eight miles in extent, strongly impregnated with salt, and abounding (it was then the wet season) in lakes and pools. The number of wild animals congregated on this swampy flat almost realised fable, the roads made by their incessant tramp resembling so many well-travelled highways. At every step incredible herds of bontebucks,[1] blesbucks, and springbucks, with troops of gnus and squadrons of the common or stripeless quagga, were performing their complicated evolutions; and not unfrequently a knot of ostriches, decked in their white plumes, played the part of general officer and staff with such propriety as still further to remind the spectator of a cavalry review."

Gordon Cumming, in 1848, describes the same country as follows: "When we came to the Vet river, I beheld with astonishment and delight decidedly one of the most wonderful displays which I had witnessed during my varied sporting career in southern Africa. On my right and left the plain exhibited one purple mass of graceful blesboks, which extended without a break as far as my eyes could strain: the depth of their vast legions covered a breadth of about six hundred yards." And again the same traveller, writing of blesbok, observes that "throughout the greater portion of the year they are very wary and difficult of approach, but more especially when the does have young ones; at that season, when a herd is disturbed, and takes away up the wind, every other herd in view follows it, and the alarm extending for miles and miles down the wind, to endless herds beyond the vision of the hunter, a continued stream of blesboks may often be seen scouring up-wind for upwards of an hour, and covering the landscape as far as the eye can see."

These narratives, incredible as they may seem, are fully supported by the testimony of old residents in the Orange River Colony and the Transvaal, which absolutely bears out the reports of Cornwallis Harris and Gordon Cumming. These men believed it impossible that the hosts of antelopes could ever be exterminated; nevertheless,

[1] Here blesbok are confused with bontebok, which do not exist in this region.

as Mr. H. A. Bryden, writing in 1899, observed, even the teeming blesboks have been well-nigh cleared from the high and healthy pasture lands, where for long ages they formed a feature in the landscape. "Undoubtedly," he continues, "the Dutch farmers of the Orange River Colony and Transvaal were the chief actors in the story of extermination. In the first instance, on entering these new countries they shot game to support themselves, their families, and servants, and for the pure pleasure of hunting. But, so soon as they found a market for the skins of the game-animals around them, they became only hide-hunters, and shot for the mere value of the pelts. And thus, for the paltry reward of a miserable shilling or two per skin, the beautiful blesbok has been brought at the present day to the verge of extinction. Three-and-twenty years ago I have seen the waggons rolling down country to Port Elizabeth from the Orange Free State [as it then was] and Transvaal loaded with the dried skins of blesbok and springbok. And any middle-aged London hide-broker will tell you that from five-and-twenty to forty years ago tens of thousands of blesbok-skins, among the pelts of other South African animals, were disposed of at the Mincing Lane sale-rooms.

"In the whole of the Orange Free State and Transvaal there are now [1899] remaining probably not more than 3000 head of these once innumerable antelopes; probably 2000 head would be nearer the mark. In the western Transvaal, upon a few farms, fair herds are to be found, as also in places in the Orange Free State, these being partially protected. In 1890, towards the end of the year, I saw a respectable herd of blesbok on one of these Transvaal farms, which I believe is still in existence. But the tendency is, unfortunately, to allow picked specimens to be shot by sportsmen desiring heads—for a pecuniary consideration."

"These antelopes," continues the same writer, "always run right in the teeth of the wind, and, when at speed, usually carry their heads very low—so much so that they have been compared by Cornwallis Harris to a pack of harriers in full cry. They are among the swiftest of all antelopes, surpassing even the fleet and marvellously agile springbok, and rivalling, as some contend, even the peerless tsessebe. In their slow paces they are, like the hartebeest and tsessebe, somewhat heavy-looking and deceptive; but when really extended, their action is magnificent, as they cover the ground at an amazing pace, and exhibit wonderful staying capacity. The flesh is good eating. The females generally drop their young in September and October."

The blesbok seems to be a species in course of developing a white

patch on the rump, for a semicircular disc above the tail is lighter in colour than the rest of the body, and shows very distinctly when the animal is running end-on, with the sun shining on it.

THE TSESSEBE OR SASSABY

(*Damaliscus lunatus*)

Bastard OR *Zulu Hartebeest*, DUTCH BOERS; *Mzansi*, SWAZI AND MATONGA; *Inkolomo*, MATABILI; *Tsessebe*, BECHUANA; *Inkalowane*, TRANSVAAL BASUTO.

(PLATE v, fig. 6)

From the other members of the genus *Damaliscus* the bastard hartebeest of the Boers—the tsessebe or sassaby of the Bechuanas—is distinguishable at a glance by the absence of a white chevron or blaze on the face, and the form of the horns. The latter, which are relatively small (the record being only $16\frac{5}{8}$ inches), incline at first obliquely upwards and outwards at an angle of about 45°, and then bend upwards and backwards in a single lunate curve, their short smooth tips inclining slightly inwards, and being separated by a wide interval.

Standing from 46 to 48 inches at the shoulder, an adult bull sassaby is of a rich chestnut-colour, with reflections, in certain lights, of purple and even orange, and the whole coat presenting that satiny sheen found in so many members of the hartebeest group. A contrast to the general red tone is formed by the broad blackish blaze down the front of the face, and the patches of the same colour on the shoulders, hips, and upper portions of the limbs. The margins of the ears and the groin are white, while the tail-tuft is black. The young are yellowish red.

In its face-markings a sassaby resembles a young blesbok or bontebok; and there is little doubt that the assumption by the adults of the two latter of a white blaze has some connection with the gregarious habits of those species.

Sassaby are widely distributed throughout South Central Africa and in the country westwards in the direction of Lake Ngami. They are specially common in Mashonaland, the eastern Transvaal, Gazaland, and the Pungwi district of Portuguese East Africa, where their range appears to overlap that of Lichtenstein's hartebeest. They frequent open downs or tracts of thin forest, but are never seen in densely forested districts.

These antelopes consort, as a rule, in small herds of eight or ten individuals, but towards the close of the dry season parties of fully 200 head may be seen. Solitary blue wildebeest bulls are often found among the herds of sassaby, which are then very difficult to approach, as, indeed, is the case with many other antelopes under similar circumstances. In south-east Africa tsessebe drink regularly, but in dry tracts they can subsist without water as easily as the Cape hartebeest.

"Though usually very wary," writes Mr. F. Vaughan Kirby, "they will often give easy standing shots at about 200 yards. They are purely grass-feeders, and in the spring-time become excessively fat, when they are excellent eating, although the fat, unless very hot, clogs in the mouth. The calves are usually born in September, but I have seen them in the last week in August and the middle of December.

"The tsessebe is usually considered to be the swiftest and most enduring antelope in South Africa; and my own experience confirms this, although the red or Cape hartebeest runs it very closely in this respect, and so, I believe, would Lichtenstein's hartebeest, only that the latter has rarely if ever been raced by a mounted man. In point of endurance, as well as in its marvellous tenacity of life, I consider the blue wildebeest to be at least the equal of the tsessebe; while for a short distance I believe the impala to be swifter than either."

Its excessive speed and endurance, coupled with its insignificant horns, are of great advantage to the tsessebe, which has thereby escaped destruction, the wear and tear of horseflesh rendering the pursuit of this species, for the sake of its hide, unprofitable even to the Boers.

Although these antelopes do not look very fast, when once started, with the heads stretched out and their legs drawn well up underneath them, "away they go," writes Mr. Kirby, "as smoothly as a machine, covering mile after mile at an unbroken pace, till at the end of six or seven miles the sportsman feels that his horse has had enough of it, while the game is still going as fresh and as strong as ever. On foot I think tsessebe are far easier to bring to bag, as one is content to take the chance they will give of a steady standing shot at 180 or 200 yards. When racing them on horseback, a bullet fired over or in front of the herd will often turn them and enable the rider to cut in; and frequently, if the leader be dropped or wounded, the others become demoralised and bewildered, and can be easily shot. I have usually found, however, that the harder a man rides, the harder the game will go, as they become thoroughly alarmed; whereas, if not unduly pressed, they often stand to look round, and thus give the sportsman

a chance. Sometimes, however, tsessebe are very foolish; and once when stalking a herd of seven, and having dropped the bull at about 160 yards, the remainder scarcely moved, so that I was enabled to bring down two cows."

THE GNU OR WILDEBEEST

(*Connochætes gnu*)

Gnu, HOTTENTOT; *Wildebeest* (OR *Zwart wildebeest*), CAPE DUTCH

(PLATE iii, fig. 6)

Gnus are grotesque-looking antelopes, with disproportionately large heads, distinguished from hartebeests and their allies by the presence of tufts of hair on their faces, the maned neck, very broad muzzle, doubly-curved smooth horns, and long, horse-like tail. They further differ by the presence of four teats in the females, in which respect, as in the form of the horns, they present a superficial approximation to cattle. Their ground-colour varies from grey to dark brown, with or without transverse stripes, the long hair of the mane and tail being either black or white. The smooth horns are expanded at the base, and are then inclined outwards or downwards, with the terminal portion suddenly bent upwards. Two well-marked species, differing widely in the curvature of the horns, may be recognised, the first of these being divisible into three more or less defined local races, often regarded as species.

Gnu is the Hottentot name for this species, which is thus the typical representative of the group, and the one to which alone that title properly belongs. When it was first encountered, some two centuries ago, by the Dutch settlers, as they made their way into the interior, they gave it the name of "wildebeest" or "wild ox," a title which has, to a great extent, tended to oust the old native designation. Early in the nineteenth century, when an allied species was discovered farther up country, the prefix "zwart" (black) was added to the Dutch title of the southern animal, which thus became the black wildebeest of the English colonists; while, when its Hottentot designation was employed, it was distinguished as the white-tailed gnu. Although such prefixes may be useful when the two species are under discussion, it should always be remembered that the present animal is the gnu or wildebeest *par excellence*; just as the English fox and badger are properly

the only representatives of their respective names, and thus require no prefix to their titles.

Standing, in the case of the bulls, about 46 inches, or sometimes perhaps rather more, at the shoulder, the gnu is characterised by the horns being greatly expanded in the vertical direction at their bases, which are nearly in contact, and curving at first downwards and outwards, and then bending suddenly upwards, with a backward and inward inclination at the tips. The long hairs of the tail are yellowish white; the mane is upright; there is a crest of long bristles in the middle of the lower part of the face, smaller tufts being situated below the eyes; the under surface of the lower jaw carries a fringe of long

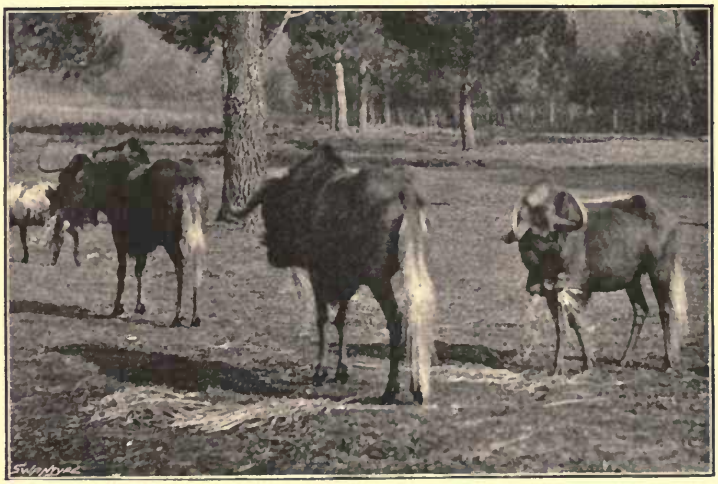


FIG. 35.—Gnus in Mr. Rudd's park at Fernwood, Newlands, near Cape Town.

hair, and there is a fringe of still longer hair on the lower part of the chest and between the forelegs. With the exception that there is some white at the root, the long hair on the jaw and mane is black. The general colour is deep umber-brown, passing into black on the face. The ears are pointed and of moderate length, and in life the eyes present a peculiarly wild and wicked appearance. The record horn-length is $30\frac{7}{8}$ inches, this being closely followed by a pair of 30 inches.

The cows are much inferior in size to the bulls, with the horns more slender and less expanded at their bases. Calves carry a long shaggy fawn-coloured coat, with a line of black on the hind part of the neck.

In former days the gnu appears to have ranged over the karoos, or open plains, of Cape Colony as far east as the Kei river, whence it extended northwards as far as the Vaal or northern branch of the Orange river, which formed approximately its boundary in this direction, although some of the older travellers report having seen a few of these animals on the Chonapas, or Mooi, river, some twenty or thirty miles to the northward of the Vaal. Griqualand West and the plains of the Orange River Colony were districts in which the gnu formerly swarmed, and at the time of the Boer war the latter territory was apparently the only district where it survived in anything approaching a wild state. Even there it remained only in the shape of a few small herds preserved on enclosed farms, and most of these were probably dispersed or destroyed during the war. Mr. C. D. Rudd has, however, an imported herd at Fernwood, Newlands, near Cape Town, from which the owner a few years ago presented a cow and calf to the British Museum, where they are now mounted for exhibition. In southern Bechuanaland the species seems to have been unknown.

In their palmy days gnus associated with quaggas, whose fate they are only too rapidly sharing. The strange antics in which it indulges form one of the most striking traits of this strange species. In the account of his travels in 1843-44, Gordon Cumming writes as follows in connection with this habit :—

"Wheeling about in endless circles, and performing the most extraordinary variety of intricate evolutions, the shaggy herds of these eccentric and fierce-looking animals caper and gambol round the hunter on every side. While he is riding hard to obtain a family shot at a herd in front of him, other herds are charging down wind on his right and left, and having described a number of circular movements, they take up positions upon the very ground across which he rode only a few minutes before. Singly and in small troops, the old bulls may be seen standing motionless during a whole forenoon, watching with a philosophic eye the movements of the other game, eternally uttering a loud and snorting noise, and also a short sharp cry which is peculiar to them. When the hunter approaches they begin prancing and capering, and pursue one another at the utmost speed. Suddenly they all pull up together to overhaul the intruder, when two bulls will often commence fighting in the most violent manner, dropping on their knees at every shock ; then, quickly wheeling about, they whirl their tails in a fantastic flourish and scour across the plains enveloped in a cloud of dust."

Like bulls, gnus are violently excited by red, and when hunting

them the Boers at the Cape were in the habit of hoisting a scarlet cloth at the top of a long pole. At sight of this the gnus would, according to Pringle, a well-known and trustworthy writer in the early part of last century, "caper about, lashing their flanks with their long tails, and tearing up the ground with their hoofs as if violently excited, and ready to rush down upon us; and then, all at once, when we were about to fire, they would bound away, and again go prancing round us at a safer distance."

Reference has already been made to the association in the old days of gnus and quaggas; it should be added that the party was completed by ostriches. Similarly the brindled gnu displays the same partiality for the company of the bonte-quagga; the ostrich in this case, too, frequently forming a third member of the apparently ill-assorted party.

In speed the gnu is well capable of holding its own among other members of the African fauna; and as it has also great staying capacity, it is a difficult animal to ride down. It had, however, a remarkable partiality for one particular piece of country, so that if driven off one day, it might be found in its own haunts a short time afterwards. Of late years the species appears to have obtained a very good idea of the distance to which it is safe to allow a human being to approach; so that on the Boer farms, before the war, it was almost impossible to procure a good head except by stalking.

Gnu venison (both that of the present and the brindled species) lacks the gamy taste characteristic of the flesh of so many South African antelopes, and is compared to very inferior beef. Calves, however, afford a somewhat more palatable dish. In old days gnu and quagga were chiefly shot by the Boer farmers as food for their Hottentot servants, they themselves eating more tasty venison, such as that of springbok, hartebeest, or gemsbok. The hides of the gnus were used for harness, whips, ropes, and other farm-gear. Even under this system the game in Cape Colony was soon decimated, but when skin-hunting became the vogue, the fate of the gnu was soon sealed.

Some twenty years ago Mr. Piet Terblans had, according to Mr. H. A. Bryden, more than a couple of hundred head of gnu on his farms, and there were at that time two other farms in the Orange River Colony on which the species was preserved. Even then the number of head living in South Africa was estimated at not more than 600 or 700, and it is now infinitely less. A few have been imported into Europe, where, as in the Duke of Bedford's park at Woburn, they have in some instances bred; and there is Mr. Rudd's herd in Cape Colony, of which mention has been already made. But the species is

evidently doomed, and as a truly wild animal no longer exists. In captivity gnus display the same grotesque habits as in the wild state. In both conditions they frequently tear up the ground with their horns, to the no small detriment of the tips of those formidable weapons, which the old bulls know only too well how to use in attack. Gnus are, indeed, dangerous animals in confinement, and should be approached with caution.

THE BRINDLED GNU OR BLUE WILDEBEEST

(*Connochætes taurinus*)

Ee-vumba, MAKALAKA; *Ikokoni*, BASUTO; *Inkoni-koni*, AMANDEBILI; *Inkongoni*, SWAZI AND ZULU; *Kokong*, BAROTSI AND BATOKA; *Koop*, HOTTENTOT; *Minyumbwe*, BATONGA; *Numbo*, MASUBIA; *Nyamba*, CHILALA AND CHISENGA; *Unzozo*, MAKUBA; *Nyambu*, SWAHILI; *Oangat*, MASAI.

(PLATE iii, figs. 3, 4, and 5)

When they first crossed the Gariep or Orange river into what is now the Orange River Colony, the Boers came across vast herds of an antelope which they recognised as a near relative of their well-known wildebeest of the plains to the south; and to this species, from its colour, they gave the name *blaauw wildebeest*, while, as mentioned above, they further distinguished the southern species as the *zwart* (black) *wildebeest*. By the Hottentots the northern species was christened *koop*, a name now fallen into oblivion; and by English naturalists it is now very generally known as the brindled, or black-tailed, gnu. This gnu is a considerably larger animal than the typical species, adult bulls standing from about 51 to 53 inches at the shoulder. The horns also are much more like those of a buffalo in shape, being but little expanded at the base, and directed at first mainly outwards, after which, at their maximum span, they bend sharply upwards, and finally inwards and forwards. The tail is wholly black, the mane is long and partially pendent, and there is a thick fringe on the throat, but no long hair on the lower part of the throat and between the fore-legs. The long hair on the face forms a large tuft below each eye. The general body-colour varies from grizzled roan to blackish slaty brown, with more or less distinct vertical dark stripes on the sides of the neck and fore-quarters, these being most

clearly marked in the lighter-coloured individuals. In the typical race the whole front of the face, together with the tuft of long hair on the forehead, the mane, and the fringe on the throat, are black; and there is no light chevron on the face. The maximum horn-lengths are $33\frac{1}{2}$ and $32\frac{1}{2}$ inches. Calves have a shorter coat than those of the southern species, with a dark stripe along the whole length of the neck, back, and loins, the colour being elsewhere fawn.

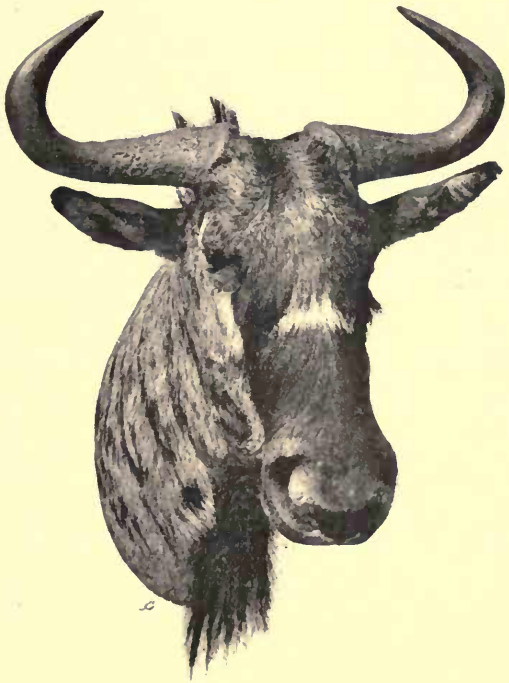


Fig. 36.—Head of Nyasa Brindled Gnu.

Although Gordon Cumming and some of the other early travellers refer to the fact that a few brindled gnus occasionally crossed the Orange river into the northern districts of Cape Colony, that river formed in the main the southern limit of the distributional area of the species, which extends thence through eastern Africa, at least as far north as the equator, or the northern shore of the Victoria Nyanza. On the opposite side of the continent the northern range embraces Benguela, where these antelopes are still numerous, as they also were

a few years ago in western and northern Bechuanaland, Ngamiland, Rhodesia, Portuguese East Africa, Ovampoland, and Damaraland. North of the Zambesi, where it is represented by distinct local races, the species is particularly numerous in the Kilimanjaro district and on the Athi plains of British East Africa. From the Orange River Colony and the adjacent districts the brindled gnu has long since been exterminated.

To the north of the Zambesi the typical southern animal is replaced by a race, *Connochætes taurinus johnstoni*, characterised by the frequent, if not universal, presence of a white chevron on the forehead, associated with a black throat-fringe (fig. 36). This Nyasa race inhabits an area lying partly in British and partly in Portuguese territory, not improbably bounded on the north by Lake Nyasa, on the west by the Shiré river, on the south by the Zambesi, and on the east by the Makua district of Mozambique. The face is mainly chestnut, and the body-colour apparently browner than in the typical race. The Nyasa gnu was named by Dr. P. L. Sclater in the Zoological Society's *Proceedings* for 1896. The brindled gnu of the Kibayu district has been separated by Mr. Oscar Neumann as *C. t. hecki*; it is stated to come very close to the next race, but has black mingled with the white of the throat-fringe, and the forehead greyish white or bright rufous.

Most distinct of all is the British East African or white-bearded race, *C. t. albojubatus*, from the districts north of Kilimanjaro, including the Athi plains, Ukambani, and other parts of British East Africa. It is broadly distinguished by the throat-fringe being wholly yellowish white and the face black and grey, while there are a few white hairs in the mane. In one phase the body-colour is pale and in another dark, as is exemplified by a pair of male heads from the Guaso Nyera Valley, British East Africa, presented to the British Museum in 1908 by Mr. R. J. Cuninghame. One of these heads shows, moreover, a white chevron, which is wanting in its fellow. As in the case of the eland, there seems, indeed, to be a good deal of individual variation with regard to the development of this chevron. The head shown in fig. 37 has, for instance, only a rudiment of this mark, while a gnu living in the Berlin Zoological Gardens in 1907 had a chestnut chevron, with the area between the horns also chestnut, but the rest of the face dark.

From the white-tailed species this gnu is distinguished by the circumstance that it does not arch its neck, and carries its ungainly head low.

"Blue wildebeest," writes Mr. H. A. Bryden, "are gregarious and usually run in troops of from twenty to fifty. In districts where they

have not been much molested, as, for example, some parts of south-east Africa between the Zambesi and Pungwi rivers, many large troops may be seen feeding together upon the plains, so that several hundred head may occasionally be in sight. During the winter the bulls will often be found apart from the cows and younger animals in considerable troops; and a party of such full-grown bulls, with their heavy Roman-nosed heads and wild, cumbrous, and fantastic appearance, present,

FIG. 37.—Head of Brindled Gnu showing a rudimentary light chevron.

when at full gallop, a fine sight. When hotly pursued, the troop usually strings out somewhat, not quite, indeed, into single file, but in a longish line. On open plains, where these wildebeests are often found feeding, even a well-mounted hunter has occasionally a some-what difficult task to bring one of them to bag. With such fleet and enduring animals it is useless to attempt to run them down in a severe tail-on-end chase, in which the hunting-pony is certain to come off worst; and if it were not for one or two rather stupid habits, it would, indeed, often be a difficult matter to circumvent them. But even on a wide open plain the mounted man can, if the wildebeest have not gained too

great a start, easily turn them from their course by sending a bullet over their heads. So soon as the missile strikes up the sand in front of them, the leaders of the troop wheel round and often head in a nearly contrary direction, thus affording the hunter a fair chance. In this way I have turned a large troop two or three times in a single early morning run, even when they were nearing the bush for which they were heading, and have thus been enabled to obtain a fair shot, and bring down the beast I wanted. In country where a certain amount of shooting goes on, blue wildebeest, if a river is near, usually drink during the night, cross the plains at early morning, and feed on the far side near the bush in which they take shelter when pursued, or during the heat of the day. If the hunter quits his waggon or camp very early, he will probably find the troop feeding towards seven o'clock not far from the fringe of this bush. If, on sighting the game with his glass, he takes a big sweep, he will most probably be able to place himself and his after-rider between the still-unsuspecting game and the line of bush, when, showing himself, he will find himself placed at a singular advantage. The wildebeest become flurried, and at once make a dash for the nearest point of bush, but are intercepted by one of the two mounted men and driven from their point. They then turn, race round in a semicircle, and try for another part of the bush. Again they are headed off, and at length losing their heads, after dashing hither and thither in a vain attempt to make good their point, and becoming for the time completely out-manœuvred, they finally make the shelter of the bush at a more distant angle, leaving one or two of their number down, and perhaps another badly wounded. In regions where they are little molested the hunter, especially in thickly-bushed country, or open park-like forest, is enabled to shoot blue wildebeest more easily than upon flat plains, as he can avail himself of covert, and often encounters the game within comparatively short range. Stalking these antelopes on foot is seldom practised in South Africa, where horses can in most cases be employed for hunting purposes, as it is desperately fatiguing work, and the gunner is hardly likely to make any considerable bag among such alert, suspicious, and fleet animals. In East and Central Africa, on the other hand, where horses cannot be used, these gnu are occasionally shot by unmounted hunters.

"The blue wildebeest possesses an even more than average share of that vitality for which nearly all African antelopes are famous; and unless hit in the right place—through the heart, lungs, or liver—will frequently, even when most severely wounded, make good its escape. I have shot a bull right through the lungs, and found numerous

patches of blood mingled with bits of lung which the animal has coughed up, and yet, after following the trail for miles, have had to abandon the chase to my trackers."

The cows usually calve between the beginning of September and early in November, at all events in the countries south of the Zambesi.

Writing of the eastern race, Mr. F. J. Jackson observes that "single bulls are often seen quite alone and at other times associating with antelopes and gazelles, particularly with *Gazella granti*. The wildebeest is a lover of the rolling open plains; but where not much disturbed it is also found in thinly timbered country, and in such localities is not difficult to approach within fair rifle-shot. On the open plains stalking in the ordinary sense is almost out of the question, and when these animals have been much shot at quite hopeless. In places

FIG. 38.—British East African Gnus in the British East African Game Preserve, photographed by Lord Delamere.

where they are rarely disturbed they will, however, often stand and allow the hunter to approach within 120 to 150 yards, provided he does not walk straight for them, but pretends to walk past, gradually sidling in nearer as he proceeds.

"On my way down country in September 1898 I crossed the Athi plains between Kikuyu and the river, which is a reserve in which all shooting, except lions and other carnivora, is strictly prohibited. As I walked along, wildebeest, *Gazella granti*, and *G. thomsoni* were on all sides, and so close and confiding that they reminded me of Kilimanjaro in the palmy days of 1887. Three ostriches even stood and looked at me within 300 yards, and every creature seemed to know that it was perfectly safe. Directly, however, I crossed the river, where shooting is allowed, and where every one going up and down the road appeared to have done his best to make up for lost time, the game (even the

confiding little *G. thomsoni*) was so wild that I could not get within range of anything excepting a bustard, which I missed.

"In open bush-country the sportsman should have little difficulty in circumventing these wildebeest by a fair stalk; but on really open plains he may find them quite unapproachable, when, rather than run the risk of merely wounding the game by long shots, a drive is preferable. With a few extra men besides the gun-bearers, this is not difficult to manage, as there are always enough ant-heaps scattered about to afford sufficient covert, and the gunner has but two things to remember: firstly, to have the game driven down or across the wind, the former for choice; and, secondly, that he and his gun-bearers must take up their position without being seen. Gun-bearers should be posted on each side of the sportsman, about 300 to 400 yards off, to act as stops, but should not show themselves unless the game is coming towards them and likely to pass out of range of the gunner, who, when once game is in sight, must lie absolutely still, however uncomfortable he may feel. The men told off to drive—six to a dozen are enough—should be instructed to keep well in line, and a fair distance apart (otherwise the game may break back), and to walk slowly, so as not to hustle and flurry the beasts. When they see that the game is getting near the sportsman they should stop altogether, and the wildebeest will most probably pass in single file; if this is not done they will perhaps go past with a rush, when it will be impossible for the gunner to distinguish a bull from a cow. To my mind there is nothing so exciting as a drive, as the suspense is little else than awful; but at the same time I think it is not justifiable unless the game are otherwise unapproachable, as it makes them so wild. Should a drive be impracticable, the only thing to do is to adopt the Bushman's stratagem, and use an imitation ostrich.

"The measurements and weight of an old bull in good condition shot by myself were as follows:—Total length, 8 feet 1 inch; height at shoulder, 4 feet $4\frac{1}{2}$ inches; tail, 1 foot $9\frac{1}{2}$ inches; weight, 475 lb."

At certain seasons the brindled gnu is much harassed by "maggots," or bots—the larvæ of parasitic flies, which infest the nose-chamber and the cavities in the cranial bones. And it is stated that the grotesque antics ("pronken" of the Boers) indulged in by the animals at such times are due to the torture occasioned by these parasites.

With this species we take leave of the first subfamily of antelopes—the *Bubalidinæ*—comprising hartebeests, blesbok, tsessebe, and gnus, and pass on to one represented by species of much smaller bodily size, which consequently appeal much less strongly to the sportsman.

THE DUIKERBOK

(*Cephalophus grimmi*)

Duikerbok OR *Duiker*, CAPE DUTCH; *Impunzi*, ZULU, SWAZI, MATONGA, AND MATABILI; *Puti*, BECHUANA; *Iputi*, BASUTO; *Gwapi* AND *Nyasa*, LOWER ZAMBESI; *Midaku* OR *Madoqua*, ABYSSINIAN; *Qualbadu* AND *Dedanid*, TIGRÉ.

(PLATE vi, fig. 7)

The name duikerbok, or duiker (meaning "diving buck"), properly belongs to a single South African species, but is applied by naturalists to a number of allied antelopes, collectively constituting the genus *Cephalophus*. Together with the four-horned antelope (*Tetraceros*) of India, this genus represents a subfamily, the *Cephalophinæ*, with the following leading characteristics. The species are of small or medium size, and have the muzzle naked, large face-glands of a more or less elongated form, a moderately long tail, well-developed lateral hoofs, and no tufts of hair at the knees. The upper cheek-teeth differ from those of the three foregoing genera in the shortness of their broad and squared crowns; and the female has four teats. In the skull there are large pits for the reception of the face-glands; and the horns are short, straight, and generally present in both sexes, although smoother and more slender in the females than in the males. The duikers, all of which are confined to Africa south of the Sahara, differ from the four-horned antelope in possessing only two horns, which are continued upwards nearly in the plane of the face, and have between them a tuft of long hairs, by which they are sometimes almost completely hidden. It is from this tuft that the scientific name *Cephalophus* (head-crest) is taken. Another characteristic feature of duikers is the long naked line formed on each side of the face by the openings of the face-glands. There are no pits in the skull above the sockets of the eyes, and no unossified spaces in the neighbourhood of the nose-bones. From their habit of skulking in thick bush (whence their name of bushbucks) duikers are but seldom seen.

Numerous species of duikers, ranging in size from a donkey to a hare, are recognised, and may be arranged in two main groups as follows:—

(i.) Typical duikers, with the horns, which are generally wanting in the females, forming an angle with the profile of the nose, or lying in the same plane as the latter, the ears long and pointed, and the

general body-colour yellow or greyish without darker markings, except a patch on the nose.

(ii.) Bush-duikers, with the horns, which are generally present in the females, pointed, directed backwards parallel to or in continuation with the plane of the nose, the ears rounded, and short or moderate, and the general colour varying from tawny red, or grey, to black, frequently with dark stripes or other marks.

The duikerbok is typically a southern antelope, and, as represented by the Cape race, is easily recognised as being the largest member of the first of the groups mentioned above, standing from about 23 to 26 inches at the shoulder. Although there appears to be considerable individual variation in the shade of colour, the typical southern race is normally speckled grey fawn, with a more or less pronounced yellow tinge; the forehead is, however, chestnut, the nose has a brown streak, and parts of the front surfaces of the limbs are also brown, while the inner sides of the legs and all the under-parts are white. Some specimens show a greater development of yellow, while in others a brown shade is noticeable; and many examples, especially those from high ground or thick bush, have longer and pale buff-coloured hair on the under-parts. The record horn-length is $6\frac{1}{2}$ inches.

An albino doe has been killed in the Transvaal, and a specimen with a white patch on the shoulder in Portuguese East Africa.

The following account of the habits of this species is contributed by Mr. F. Vaughan Kirby:—

"The duiker is distributed, generally in pairs or singly, throughout southern Africa, from the Cape to the Zambesi; and wherever I have travelled north of that river, through Portuguese Zambesia and the Mozambique province, I have met with it, although less frequently than in the south. These antelopes are partial to open country with scattered patches of bush, foot-hills and wooded kloofs, scrub-jungle, or thin forest. If water is near, they drink about every other day, but I have met with them in absolutely waterless localities. They eat both leaves of shrubs and grass, and, like bush-buck, red duiker, and blue buck, greedily devour all berries and fruits in season. The young are born at the commencement of the rainy season, and are easily tamed."

The duikerbok, owing to the habit from which it takes its name, is somewhat difficult to shoot. In British Bechuanaland it is sometimes hunted with hounds, and at Kimberley is regularly coursed, although many of the old bucks, perhaps as the result of selection, cannot be taken by even the fleetest greyhounds. The flesh is poor. An adult buck will weigh about 30 lb.

The Natal race (*Cephalophus grimmi campbelliæ*) was described in 1846 by Dr. J. E. Gray as a distinct species, supposed to come from the west coast. It is described as grizzled with blackish grey. The representative of the species from the neighbourhood of the Victoria Falls of the Zambesi has been separated by Dr. von Lorenz (*Ann. Museum Wien.* vol. ix. p. 60, 1895) as *C. g. flavescens* on account of its yellow colour.

The Nyasa race of this duiker, of which a mounted specimen has been presented to the British Museum by Captain R. Crawshay, is smaller than the typical race, with more brown on the front of the legs, especially the hind pair, and the whole of the pasterns of this colour, while the belly is whiter. It has been named *C. g. ocularis.*

On the west coast the duikerbok ranges as far north as Angola; while on the east side of the continent, north of the Zambesi, it extends through British East Africa and Somaliland into Abyssinia.

The Abyssinian duiker is, however, a much smaller animal, generally regarded as specifically distinct, under the name of *C. abyssinicus* or *C. madoqua*, although it may best be classed as a race of the southern species, with the designation *C. g. abyssinicus.* It is no larger than the next species (that is to say about 16 or 17 inches high), from which it is readily distinguished by its yellowish-fawn colour; the forehead being chestnut, the nose, the front of the legs, and the fetlocks brown, and the under-parts white.

The Kavirondo duiker, from the east and north of the Victoria Nyanza, has been separated by Mr. O. Neumann (*Sitzungs-Berichte Ges. Naturfor. Berlin*, 1905, p. 89) from *abyssinicus* on account of its darker colour. Although named by its describer *Sylvicapra abyssinica nyansæ*, it may be known as *C. g. nyansæ.*

Of the Abyssinian race Major Powell-Cotton writes as follows:—

"If the sportsman is indifferent as to sex, he will not find them difficult shooting, as they do not usually go far when disturbed, and soon begin to feed again, if not followed immediately.

"The upright tuft of hair on the forehead of the females and young males is so prominent that, at a little distance, one can hardly distinguish it from the short horns of the old bucks, placed, as these are, close together; in them the tuft of hair has almost gone. I shot a female on 14th May 1900 that carried an unborn kid about eight or ten days from birth. A specimen shot on the foot-hills west of the ridge that divides the Lake Tana basin from the low hot country towards the Sudan was the one killed at the lowest elevation. I saw none actually in the plains."

THE CROWNED DUIKER

(*Cephalophus coronatus*)

This species, which was named by Dr. Gray in 1843 on the evidence of Gambian specimens in Lord Derby's menagerie at Knowsley, may perhaps be regarded as the West African representative of the duikerbok. Standing about 15 or 16 inches at the shoulder, it is characterised by the bright yellow colour of the coat, with a faint suffusion of black; there is, however, a dark streak on the top of the nose, and the tip of the tail and the legs below the knees and hocks are blackish brown or black. Further specimens are required to illustrate fully the affinities of this species.

Although typically from Senegambia, this species is stated to range into Nigeria and the Lake Tchad district.

THE YELLOW-BACKED DUIKER

(*Cephalophus sylvicultor*)

(PLATE vi, fig. 1)

With this, the largest, member of the genus we come to the second group, in which the horns incline backwards more or less nearly in the plane of the nose. The number of forms which have received separate names is very large; and as many of them are evidently more or less closely allied to one another, it is probable that in several instances they might advantageously be reduced to the rank of races. In the present state of our knowledge it seems, however, best to follow the arrangement generally adopted and to allow specific rank to nearly all. As the majority are of comparatively little interest to sportsmen, they are treated as briefly as possible.

The "bush-goat," as the yellow-backed species is called by Englishmen on the west coast, is easily recognised not only by its large relative size, but likewise by its peculiar and characteristic type of colouring.

Standing about 34 inches at the shoulder, this antelope is of heavy and ungainly build, with short, broad, and rounded ears, and the coat very short on the fore-quarters, but longer on the loins, where, however,

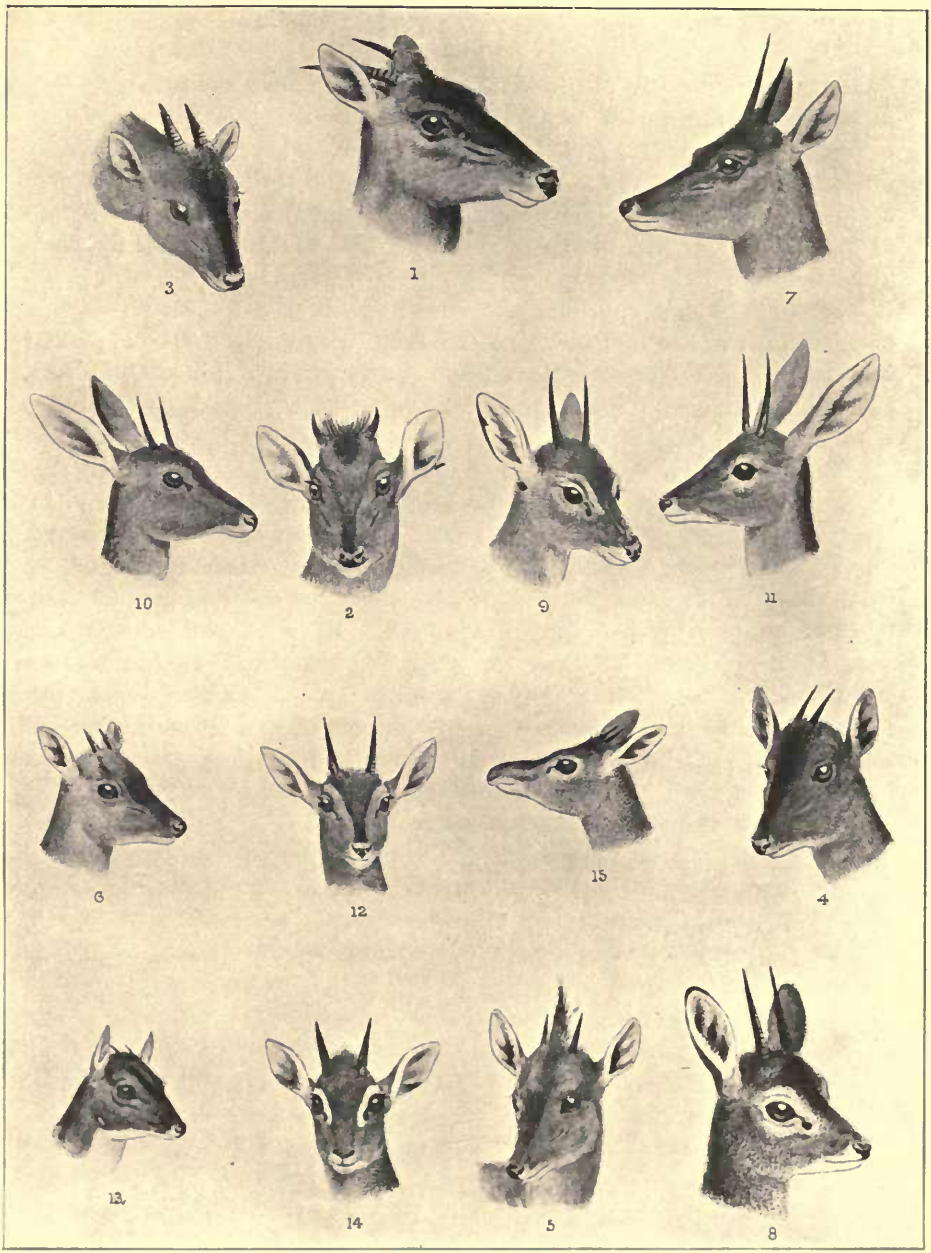


PLATE VI

1. Yellow-backed Duiker.
2. Red Duiker.
3. Harvey's Duiker.
4. Black-faced Duiker.
5. Red-flanked Duiker.
6. Blue Duiker.
7. Duikerbok.
8. Klipspringer.
9. Oribi.
10. Grysbok.
11. Steinbok.
12. Suni.
13. Royal Antelope.
14. Sali's Dik-dik.
15. Kirk's Dik-dik.

it becomes worn off in old individuals so as to show the whitish under-fur, or even the naked skin, at the base of the tail. The general colour of head, body, and limbs is dark blackish brown; but the muzzle, cheek, chin, and the tips of the ears are whitish; while on the middle line of the loins is a long yellowish triangular stripe, extending as far forwards as the middle of the back, and in old animals forming a light rump-patch posteriorly.

In quite young specimens all the hairs of the hind part of the body, except in the region where the light triangle is subsequently to appear (in which they are black-tipped), terminate in white tips; and the rump-patch, which eventually becomes whitish and partly bare, is clothed with long black hairs.

This species ranges on the west coast from Sierra Leone to the Gaboon and Angola; but how far into the interior (at all events in its typical form) is still unknown. The colour-changes mentioned above render it often difficult to determine what variations are due to immaturity and what to distinctness of type. Consequently the determination of allied species and races is beset with difficulties. The important part to bear in mind is, however, that the under-mentioned forms, whether they be distinct species or not, prove that members of the yellow-backed group extend right across the forest-region into the Ituri district and Rhodesia.

The maximum recorded horn-length is 7 inches.

In *Notes from the Leyden Museum*, vol. xxii. p. 187, 1900, Dr. F. A. Jentink has suggested the name of *Cephalophus thomasi* for the Congo representative of the yellow-backed duiker, and *C. sclateri* for another phase in which the horns are curved.

Very little is known with regard to the habits of this species and its immediate relatives.

RHODESIAN YELLOW-BACKED DUIKER

(*Cephalophus coxi*)

Chibusimawe, RHODESIA

In the *Proceedings* of the Zoological Society for 1902, vol. i. p. 1, Mr. O. Thomas referred the skin of a large duiker from north-east Rhodesia to the yellow-backed species; remarking that "no differences of importance were perceptible between the Rhodesian specimen and examples from West Africa." Four years later Dr. F. A. Jentink

(*Notes Leyden Museum*, vol. xxviii. p. 117, 1906) described a male example of the same type from north-west Rhodesia as a new species under the above name.

This specimen, which is rather smaller than a female of *Cephalophus sylvicultor* from Liberia, is described as differing from that species in the following respects:—

The horns are shorter and the hoofs more slender; while the general colour is decidedly distinct, and the light triangle on the back somewhat larger. Moreover, the buttocks are coloured like the triangle and not like the flanks, as in *sylvicultor*, while there is no black band separating the triangle from the rump-patch.

Dr. Jentink believes that the specimen figured in pl. xiv. fig. 2 of the *Book of Antelopes* as a young male of the typical *C. sylvicultor* is an adult of the eastern representative of the group, which, as suggested above, may be nothing more than a local race of the western animal.

ITURI YELLOW-BACKED DUIKER

(*Cephalophus ituriensis*)

In the *Comptes Rendus* of the Paris Academy of Sciences for 1907 Baron Maurice de Rothschild and Mr. H. Neuville described a yellow-backed duiker from the Ituri Forest, East Central Africa, as nearly allied to *Cephalophus coxi*, but, in their opinion, entitled to rank as a distinct species for which the name *C. ituriensis* was proposed.

The colouring is stated to be duller than that of *coxi*, and shows a tendency in many parts to a yellowish-black tinge, in place of one of greyish yellow or grey. The yellowish black passes on the cheeks and chin into a clear grey like that of *coxi*; but in some parts the tint darkens nearly to black. The forehead, for instance, is almost black, in place of chestnut, the same being the case on the back of the neck. On the other hand, the crest of hair on the vertex of the head is chestnut, with only a slight mixture of black. The shoulders, which are covered with short dark hair, grade in colour from the dark of the nape to the brown of the ill-defined dorsal triangle, which is narrow, and imperfectly separated from the light area corresponding to the rump-patch of *coxi*. In the triangle the hairs are blond with blackish-brown tips, while in the rump-patch they are black with whitish tips.

If *C. coxi* be regarded as a race of *C. sylvicultor*, the same course will have to be followed in the case of the Ituri duiker.

JENTINK'S DUIKER

(*Cephalophus jentinki*)

Approximating to *sylvicultor* in point of size, and resembling that species in its heavy build, short rounded ears, and relatively long and diverging horns, Jentink's duiker, which was named and described by Mr. O. Thomas on p. 417 of the Zoological Society's *Proceedings* for 1892, differs markedly in the matter of colouring.

On the body, both above and below, the general colour of the coat is a coarsely grizzled grey, produced by the presence of black and white rings on the hairs; but the head, ears, neck, throat, and a narrow line down the middle of the chest are deep black. A whitish collar round the fore-quarters serves to define the black from the grey area; and the lips and chin, the spaces between each pair of limbs, and the limbs themselves are also whitish, while a dark mark traverses the upper part of each fore-leg. The skull is relatively longer than in *sylvicultor*. This species is a native of Liberia.

ABBOTT'S DUIKER

(*Cephalophus spadix*)

A species of comparatively large size named by Mr. F. W. True in 1890 on the evidence of a specimen collected by Dr. W. L. Abbott high up on Mount Kilimanjaro. The general colour is described as dusky chestnut-brown, with the face, chin, and throat pale greyish brown; the hairs of the crest are bright chestnut at the base with black tips; and the tail is dusky, except at the tip, on which the hairs are nearly white. The horns, which are $4\frac{1}{2}$ inches long in the type specimen, are comparatively large, slender, and straight, without basal thickening. The exact shoulder-height does not appear to be known.

The species, which is but little known, is undoubtedly a large relative of the red duiker.

No example of this species is at present exhibited in the galleries of the Natural History branch of the British Museum. Whether it is rare in its native haunts is not known; and nothing has been ascertained with regard to its habits. Dr. Abbott is well known as a collector of animals from eastern Africa and the Malay countries, but unfortunately (from the British point of view) all his specimens go to America.

THE RED DUIKER

(*Cephalophus natalensis*)

Rooi Bosch-bokje, CAPE DUTCH; *Mkumbi*, ZULU; *Msumbi*, SWAZI AND MATONGA; *Isikupu*, BASUTO; *Chisimbi*, LOWER ZAMBESI

(PLATE vi, fig. 2)

This species, of which the bucks stand from about 18 to 19 inches at the shoulder, and weigh from 26 to 28 lb., typifies a subgroup characterised by the predominance of red in the colouring. In the present species the colour is wholly bright rufous bay, or chestnut, with the throat, inner sides of limbs, and under-parts brownish yellow, and the tail, which is slender, rufous at the base, and brown tipped with white at the extremity. The ears are short and rounded; and the tuft on the crown of the head is longer than in the duikerbok, nearly concealing the short horns, of which the maximum length is $3\frac{7}{8}$ inches. With rare exceptions, the females are horned.

The uniform colour of the head, body, and limbs serves to distinguish this species, which is often known as the Natal duiker, from all its relatives. These elegant little antelopes inhabit the wooded districts of Natal, Zululand, Swaziland, the Transvaal, and Mashonaland, and also extend along the east coast into Mozambique. The Portuguese East African form has been separated by Dr. E. Trouessart (*Bull. Mus. Paris*, 1906, p. 445) as *Cephalophus natalensis vassei* (see p. 153). In habits they closely resemble the other bush-dwelling members of the genus, and seldom leave covert except at early morning and evening to feed. As a rule, they associate in pairs, although it is by no means uncommon to see small parties of five or six feeding in company.

Their food consists chiefly of the leaves and young shoots of shrubs, together with berries and other fruits, and they but seldom graze. In summer they drink twice daily, but in winter a draught once a day is stated to meet their requirements. Their cry, which is seldom uttered, is a shrill whistle. The young are lighter in colour than their parents, and are born in October and November.

The flesh is superior in quality to that of the duikerbok, and is in best condition during December and January. If stalked in covert in early morning before they settle down to rest for the day, these

duikers afford good sport. In sunlight their bright colour renders them conspicuous, although in shade they are stated to be almost invisible. They are difficult to drive out of covert with dogs, but when in the open are easily caught. Lesser red buck is a common name in Natal for this duiker.

ITURI RED DUIKER

(*Cephalophus centralis*)

The Ituri Forest of East Central Africa is inhabited by a red duiker closely approaching the typical *Cephalophus natalensis*, but distinguished by the following features :—

The more sombre colour of the feet, the exclusively red hue of the crest on the vertex of the head, which has no mixture of black hairs, the brighter tint of the forehead, and the somewhat superior bodily height.

This species, or race (and it is almost certainly the latter), was described and named by Baron Maurice de Rothschild and Mr. H. Neuville in the *Comptes Rendus* of the Paris Academy of Sciences for 1907.

THE BLACK-FACED DUIKER

(*Cephalophus nigrifrons*)

Ngolo, WEST AFRICA

(PLATE vi, fig. 4)

This is a medium-sized member of the red group distinguished from *natalensis* by the presence of black on the face and limbs. Although discovered by Paul du Chaillu so long ago as 1865, it was not named till many years later, by Dr. J. E. Gray of the British Museum.

In height it stands about 18 or 19 inches at the withers. The general colour is deep chestnut, scarcely paler below than above ; but the crest and middle line of the face are black, thus forming a striking contrast with the rufous eyebrow-streaks ; the nape is also browner, and the legs from the knees and hocks downwards are blackish, as is also the tail, except for the white hairs in its terminal tuft. The horns,

although very short, are somewhat basally expanded; the skull has a convex frontal region, and the hoofs appear to be relatively long.

The Cameroons and the Gaboon are the home of this species, which is a bush-haunting animal.

ALEXANDER'S DUIKER

(*Cephalophus claudi*)

A duiker from Bambili, in the Welle Valley, Congo Territory, obtained during the Alexander-Gosling expedition from Nigeria to the Upper Nile, and named after Captain Claud Alexander, was described by Messrs. Thomas and Wroughton in the *Annals and Magazine of Natural History* for 1907 (ser. 7, vol. xix. p. 386) under the above name. It is near akin to *nigrifrons* both in size and colour, but of a much darker and richer tint; the general colour being nearly "burnt-sienna" above, and only slightly paler on the flanks and under-parts. There is, however, a dark stripe on the middle line of the latter. Certain characters also distinguish the skull from that of *nigrifrons*.

THE RUDDY DUIKER

(*Cephalophus rubidus*)

Under this name Mr. O. Thomas described in the *Proceedings* of the Zoological Society for 1901, vol. ii. p. 89, a small duiker from the Ruwenzori district which appears to be nearly related to *Cephalophus nigrifrons*, but has a thicker and more woolly coat, a deeper and more uniform general colour, and a larger extent of black on the lower part of the hind-legs.

The general colour of the thick, close, and slightly woolly fur is uniformly rich chestnut-rufous, the basal portion of the hairs being rather greyer, and along the middle line of the back, especially near the loins, these greyer bases become more decidedly grey-brown, and, by showing through, communicate a darker shade to the aforesaid line. On the neck the hairs take the usual backward direction; the middle line of the back is rather browner than elsewhere, and there is a white chin-patch. The under-parts are paler rufous, becoming whitish between each pair of legs. From the shoulders and hips the colour

gradually darkens to the knees and hocks, which, with the lower part of the legs, are blackish brown. The tail is short, black grizzled with rufous and white above, and dirty white below and at the tip. The presence of a white chin-patch and absence of a dark line on the under-parts distinguish this species from *claudi*.

WEYNS'S DUIKER

(*Cephalophus weynsi*)

This species, which inhabits the neighbourhood of Stanley Falls on the Congo, was described, with a coloured plate, by Mr. O. Thomas in the *Annales* of the Congo Museum for 1901, zoological series, vol. ii. part i. p. 15. It is nearly allied to *Cephalophus nigrifrons*, with which it agrees in having no dark dorsal stripe, but differs from that species by the hairs of the nape of the neck being directed forwards instead of backwards. The general colour of the body is brown in front and bright red behind, the tint of the rump corresponding with that of *nigrifrons*. The upper surface of the muzzle is chocolate-brown, passing gradually into a mixture of red and black on the forehead, and then into red-maroon in the neighbourhood of the tall crest; the cheeks are pale brown above, but whitish lower down. The short and rounded ears are brown with white margins.

JOHNSTON'S DUIKER

(*Cephalophus johnstoni*)

The duiker inhabiting the Toro district, to the east of Mount Ruwenzori, is closely allied to the preceding, from which it differs by its thicker and more woolly coat and much darker colour. It was named by Mr. Thomas in the Zoological Society's *Proceedings* for 1901, vol. ii. p. 89.

ISAAC'S DUIKER

(*Cephalophus ignifer*)

This duiker, which was first obtained by Mr. F. W. Isaac in the Eldoma Ravine, British East Africa, at an elevation of about 7000 feet, and described by Mr. O. Thomas in the Zoological Society's

Proceedings for 1903, vol. i. p. 226, is allied to *Cephalophus weynsi* and *C. johnstoni* in colour and general characters, but differs from both in the hair of the nape of the neck being directed backwards.

Medium in size, with a fine, close, glossy coat, this species has the general colour of the upper-parts bright rufous or bay, darkening on the neck and shoulders to dull brownish. The hair of the forehead is mixed rufous and black; while the crown and back of the head are of the same bright rufous as the back, with the surmounting tuft tending more to chestnut. The muzzle is blackish; the lips and chin are white; the ears dark brown externally and white on the margins and inside; and the throat is rufous. The middle line of the under-parts is brown, shading into rufous on the flanks, and passing into white between each pair of legs. From the rufous shoulders and thighs the colour gradually darkens to the lower segments of the legs, which are brown, but nearly black above the hoofs. The tail is rufous above and white beneath, with a brown and white tuft at the tip.

HARVEY'S DUIKER

(*Cephalophus harveyi*)

(PLATE vi, fig. 3)

Named after Sir Robert Harvey, and a native of the Kilimanjaro district, this duiker belongs to the same subgroup as *Cephalophus ignifer*, but is distinguished by the black forehead and the absence of chestnut in the head-tuft. In general appearance it is very like the black-faced species; but the horns are larger and stouter, especially at the basal portion of their front surface, the maximum recorded length being $3\frac{5}{8}$ inches.

ROBERTS'S DUIKER

(*Cephalophus robertsi*)

A duiker from Portuguese East Africa described by the Hon. Walter Rothschild on p. 691 of the Zoological Society's *Proceedings* for 1906 under the above name is stated to be nearly related to *harveyi*, *castaneus*, *callipygus* and *natalensis*, but to differ from all in being quite uniformly orange-chestnut, of a much paler, yellower, and brighter shade. Locality suggests that Trouessart's *Cephalophus natalensis vassei* (see p. 149) is identical with this species.

LEOPOLD'S DUIKER

(*Cephalophus leopoldi*)

In addition to the above-mentioned Ituri red duiker, the red group of the genus, as typified by *Cephalophus natalensis*, is represented in the Ituri Forest of East Central Africa by a duiker to which Baron Maurice de Rothschild and Mr. H. Neuville (*Compt. Rend. Ac. Paris*, 1906, p. 1257) have given the name *C. leopoldi*. They regard it as near akin to *C. nigrifrons* and *C. harveyi*, but distinguished by features of sufficient importance to permit its recognition as a distinct species.

In the stoutness of its horns it agrees with the two species last mentioned, but exceeds both in the degree of development of this character. The general colour recalls that of *natalensis*, being bright rufous, but is rather darker on the back and duller on the neck and shoulder than in that species. The crest is long and entirely chestnut, thereby differing from *harveyi* and *nigrifrons*, as well as *natalensis*; but it has nevertheless a darker and redder tint than the general body-colour. The muzzle and nose are black, while there are flecks of black on the forehead, in which respect this duiker comes nearer to *natalensis* than to the other two species. The ears, which are white interiorly, have black tips. The throat is whitish; the cheeks are of a grey-fawn, like the upper part of the chest; the lower part of the latter and the under-parts generally being blackish fawn, unlike *harveyi* and *natalensis*; while the groin is whitish. The lower segments of the limbs, especially in the hind pair, are blackish; in this respect resembling *nigrifrons* and differing from *natalensis* and *harveyi*. The tail is rufous in the basal portion of its upper surface, and terminates superiorly in a dark line, and inferiorly in long white hairs.

THE WHITE-BELLIED DUIKER

(*Cephalophus leucogaster*)

This is another of the red duikers with dark markings, and is specially characterised by the dull chestnut-rufous body-colour relieved by a blackish dorsal stripe, the rufous face, which is darker in the middle line than elsewhere, the mixed rufous and black crest, the browner nape, and, above all, the white under-parts, a white line

also running down the hair covering the front surface of the hind cannon-bones. The dorsal stripe is mixed with rufous on the withers, and does not become well defined and black till farther back ; on the tail it is narrow but very distinct. The tail terminates in a large black and white tuft. The hind surfaces of the buttocks are pure white, thereby distinguishing the species very markedly from the next, in which they are chestnut.

This species is a native of the Gaboon, whence the skin and skull of the type specimen were brought by du Chaillu.

It is a pity that we know practically nothing of the habits of this and the allied west coast species, for it seems almost certain that these are connected in some way with their colouring. A chestnut body with a dark dorsal stripe in association with a white belly is, for instance, a type of colouring characteristic of animals spending a considerable amount of time in the open in strong sunlight ; in which situations it serves a protective purpose. It, therefore, seems legitimate to suggest that the present species is less strictly a bush-dwelling animal than such of its relatives as have the under-parts of the same general colour as the back.

THE BAY DUIKER

(*Cephalophus dorsalis*)

With this medium-sized species we revert to one in which the under-parts are dark ; one of its characteristics being the very short and broad ears. The general colour is bright chestnut-rufous, with a dark dorsal stripe running from the nose to the tail, interrupted only at the crest, which may be either wholly black or wholly rufous, or mixed black and red. The middle line of the face is brown, and the eyebrow-streaks are bright rufous. The dorsal stripe, which in some cases is well defined and at others widens out into an irregular patch on the withers, is wholly black on the back. The under-parts, inner sides of the limbs, and the hind surfaces of the hips are rufous, like the flanks. There is a longitudinal black or blackish patch on the chest ; the fore-limbs are brown from the shoulders downwards, and the hind-limbs from just above the hocks ; while the tail is almost wholly black above, but white below at the tip.

The range of this duiker extends from Sierra Leone to the Gold Coast.

THE CHESTNUT DUIKER

(*Cephalophus castaneus*)

The Cameroons representative of the bay duiker was originally described by Mr. O. Thomas on p. 421 of the Zoological Society's *Proceedings* for 1892 as a subspecies, but was raised to specific rank in his description of Weyns's duiker, to which reference has been already made (p. 152).

This antelope is slightly superior in size to the last, and apparently has rather larger ears. In colour it is uniformly deep chestnut, with the exception of a black dorsal stripe, and the brown lower portion of the legs; the chestnut eyebrow-stripe being less distinct than in *dorsalis*, and the general colour of the head darker and duller than in that species. Moreover, the skull has the slender elongate muzzle characteristic of the genus generally, whereas that of the bay duiker has a short conical muzzle. There is likewise a difference in the form of the auditory bladder, or bulla, at the base of the hind part of the skull.

THE WHITE-LIPPED DUIKER

(*Cephalophus leucochilus*)

Under this name Dr. F. A. Jentink has described (*Notes Leyden Museum*, vol. xxiii. p. 21, 1901) a duiker from Loango, Angola, which is stated to come very close to *Cephalophus dorsalis*, but to be larger, heavier, and darker-coloured. It is further distinguished by the higher portion of the upper lips being white, like the chin; and there is also a large white spot above each eye, terminating in a white line tending towards the upper part of the nose.

OGILBY'S DUIKER

(*Cephalophus ogilbyi*)

This species, which also belongs to the red group, is a native of Fernando Po, although there is a possibility that it may also occur on the mainland. Of medium size, it has the general colour bright

orange, with a more rufous tendency on the hind-quarters. With the exception of the brown nose, the face is coloured like the body; but the nape and sides of the neck are brown or blackish, although so thinly haired that the skin shows through and the colour is little affected. A black dorsal stripe commences at the withers, and after becoming narrower and more sharply defined on the loins, is continued on to the tail. With the exception of the brown or blackish fetlocks, the limbs are dull yellowish in tint.

BROOKE'S DUIKER

(*Cephalophus brookei*)

The mainland (Fanti) representative of *Cephalophus ogilbyi*, from which it is distinguished by the reversal of the hairs of the nape, the broader dorsal stripe, which stops short of the tail, the lighter colour of the lower part of the legs, and the less swollen frontal region of the skull.

In size this species is slightly inferior to *C. ogilbyi*, its general colour being very similar to that of the specimen figured in plate xviii, fig. 2 of the *Book of Antelopes* under the latter name. That figure probably indeed represents the present species, although the brow lines are too strongly marked, and the limbs, which should be uniformly light to the hoofs, too dark. In *ogilbyi* the front of the cannon-bones and the whole pasterns are black. The hairs of the middle of the nape are directed forwards for a distance of 3 or 4 inches, as in *C. weynsi* and *johnstoni*. The broad black dorsal stripe ends 3 or 4 inches short of the root of the tail, the latter having the tuft at the tip black and white.

The species was named in 1903 by Mr. O. Thomas in the *Annals and Magazine of Natural History*, ser. 7, vol. xi. p. 290.

PETERS'S DUIKER

(*Cephalophus callipygus*)

This rare but handsomely coloured species was discovered in the Gaboon by Dr. R. Bucholz in 1874, and named two years later by Dr. Peters. Its most characteristic feature appears to be the broad black dorsal stripe, which commences at the withers, widens out at the loins, and includes the whole of the hind surfaces of the hips

and the hind-legs as far down as the hocks, as well as the tail, with the exception of the under surface of the tip, where the hairs have white points. In height the species is approximately the same as *dorsalis*. The general colour is yellowish brown, becoming more distinctly rufous on the loins; but the forehead and crest are rich rufous, the chin and throat white, the under-parts elsewhere yellowish grey; while on the sides of the thighs next the black the body-colour becomes rich rufous.

THE RED-FLANKED DUIKER

(*Cephalophus rufilatus*)

(PLATE vi, fig. 5)

This species, the last representative of the red group, has much the appearance that we should expect to find in a hybrid between *coronatus* and *maxwelli*, although the number of specimens that have been brought to Europe is in favour of its being a distinct species, representing a dwarf type of the *dorsalis* group with the black replaced by grey, and the chestnut lighter than usual.

Typically from the Gambia, but occurring also in the Gaboon, Nigeria, and Ashanti, this tiny duiker stands only about 14 inches at the withers, and has minute horns. In general colour it is in part bright yellowish rufous and part bluish grey; the former tint obtaining on the sides of the face, neck, shoulders, flanks, rump, and under-parts, while the latter prevails on the middle line of the nose, the forehead, the back of the head and ears, the middle line of the back from the withers to the rump, and the greater portion of the limbs.

To a duiker from the upper Welle Valley, Congo territory, Messrs. Thomas and Wroughton, in the *Annals and Magazine of Natural History* for 1907 (ser. 7, vol. xix. p. 385), gave the name *Cephalophus rufilatus rubidior*, on account of its being much redder than the typical Gambian race of the species. The general colour of the rather long and harsh fur is dark reddish brown, approaching "burnt-sienna," with a narrow patch on the middle line of the back much darker and showing a bluish tinge. The under-parts are a paler shade of the same colour. The colour-pattern is as in the typical race, although the dark dorsal area is rather less defined, and the ochery buff ground-colour replaced by burnt-sienna, while the smoky grey of the

nape, dorsal patch, and feet of the type race gives place to slaty grey in the Welle race. In both races the chin and the inner sides of the thighs are white.

THE BANDED DUIKER

(*Cephalophus doriæ*)

Very few words will suffice for this striking species, which is a native of Liberia (where it is commonly known as the "mountain deer"), distinguished from all its kin by the pale rufous back being marked by a number of broad black transverse stripes. In height it stands about 16 inches. The zebra-antelope, as the species is often called, may be regarded as an aberrant off-shoot from the group of red duikers.

WALKER'S DUIKER

(*Cephalophus walkeri*)

With this species, which was named by Mr. O. Thomas in the Zoological Society's *Proceedings* for 1906, on the evidence of a female specimen killed on the Tachila river, about twenty-five miles from Blantyre, Nyasaland, we come to the first of the dusky or blackish duikers, which are evidently specialised derivatives from the more primitive red group. It is a very dark-coloured, medium-sized species, about equal in size to *Cephalophus leucogaster*.

The general body-colour is dark greyish brown, approaching sepia; the hairs, except on the back, where they are nearly black, being speckled with buffish; while on the under-parts and inner sides of the limbs the colour lightens to the tint known as hair-brown. From the muzzle to between the ears the front of the face is black, as is the tuft; but the chin and cheeks are pale fawn, with a line of more distinct buff near the black above the eyes; the backs of the large ears are grizzled brown or blackish. A black line along the nape connects the black face-patch with that of the loins. The limbs are wholly dark, with the lower portion nearly black; but there seems to be some white on the tail.

This species may prove to be allied to *C. niger*; the dark forehead distinguishes it from *C. leucoprosopus*, in which that part is chestnut.

THE WHITE-FACED DUIKER

(*Cephalophus leucoprosopus*)

Resembling in some degree *Cephalophus walkeri*, this East Central African duiker, which was described by Mr. Oscar Neumann in the *Sitzungs-Berichte Ges. Naturfor. Berlin*, 1899, p. 18, differs from that species by the red forehead and white throat, under-parts, and inner sides of the limbs.

THE BLACK DUIKER

(*Cephalophus niger*)

In this species the size is medium, about 18 inches at the shoulder, and the general colour uniform dark smoky brown, darkest on the rump and limbs, and palest on the throat and chest. The face is tawny, darkening into rich rufous on the crest, but the centre of the forehead is sometimes brown, or even black; the ears are black externally and rufous internally; and the tail is black above, with a whitish tuft at the tip. The horns are usually from 3 to $3\frac{1}{2}$ inches long, and straight, with rough bases; shorter horns being present in the female. The skull is long and narrow, with a swollen forehead, and the middle notch of the palate slightly in advance of the lateral pair.

From Liberia to the Gold Coast is the habitat of this duiker, which, in common with other members of the genus, is locally known in Liberia as the bush-goat. Like most duikers on the west coast, it is an inhabitant of mountain-forests, whence it issues to feed in the plantations and open glades. Its flesh has a strong bitter taste.

MAXWELL'S DUIKER

(*Cephalophus maxwelli*)

Fulintongue (corrupted into *Philantomba*), LIBERIA

This western species is considerably smaller than the black duiker, standing only about 14 inches at the shoulder. The general colour is uniform slaty brown, paler on the under-parts and inner sides of the

limbs, with whitish streaks above the eyes. The small and rounded ears are dark brown externally. The rump and backs of the hips are like the body in colour, except that the tint darkens somewhat on each side just below the tail, as it also does on the basal portion of the upper surface of the tail itself, which is elsewhere brown above and whitish beneath. The limbs are coloured like the body on their outer sides.

The horns form a slight angle with the plane of the nose, although the inclination does not approach that in *Cephalophus grimmi*. Horns usually about 2 inches in length; very minute in females. Skull broad and stout, with the middle notch of the palate very slightly in advance of the lateral pair.

This species is definitely known to range from Gambia to the Gold Coast.

THE BLACK-RUMPED DUIKER

(*Cephalophus melanorheus*)

Described by Dr. J. E. Gray in 1846, this western species differs from *Cephalophus maxwelli* by its somewhat inferior size (13 inches), and by the brown of the back shading into black on and at each side of the base of the tail, below which there is a sudden change to white on the backs of the hips. The horns of males scarcely exceed those of the opposite sex in length.

This species inhabits the country south and east of the Niger, extending on the west coast from the Cameroons to Angola and eastwards to the coast opposite Zanzibar.

THE UGANDA DUIKER

(*Cephalophus æquatorialis*)

This duiker, which was named by Dr. P. Matschie in 1892, is the eastern representative of *Cephalophus melanorheus*, of which, indeed, it may well be regarded as a local race.

It differs from the western animal by the lower surface of the body being but slightly lighter than the upper, and the absence of horns in the female. As its English name implies, it is a native of Uganda; Chagwi being the type locality.

In the Ituri Forest it is represented by a race distinguished by slight variation in colour, especially on the under-parts, to which Baron Maurice de Rothschild and Mr. H. Neuville (*Compt. Rend. Ac. Paris*, 1907) have given the name *C. æquatorialis bakeri*.

THE BLUE BUCK OR BLUE DUIKER

(*Cephalophus monticola*)

Blaauw-bok, CAPE DUTCH ; *Ipiti*, ZULU

(PLATE vi, fig. 6)

This well-known species, which has many scientific aliases, agrees in size and the characters of the horns with the black-backed duiker, and in colour with Maxwell's duiker, except that the limbs from the knees and hocks downwards are bright rufous. It is the earliest named of the blue duikers, dating from 1811 ; and it is possible that *melanorheus*, *maxwelli*, *æquatorialis*, and *nyasæ* should be regarded in the light of its local races.

The species is widely distributed in south-eastern Africa, the Umgozy Forest in Zululand, Eland's Poort, and Galgebosch, in the Uitenhage Range, being well-known localities in which it swarms. On account of slight colour-differences, the Zululand form has been distinguished as *Cephalophus monticola caffer*.

The following excellent account of the habits of this species was communicated by Mr. F. Vaughan Kirby to the Zoological Society's *Proceedings* for 1899 :—

"Even in the densest bush, the spaces underneath to a height of two feet from the ground are comparatively clear, hence the little blue duiker, or blue-buck, as it is generally called, moves about in what to him is practically open bush, in which objects are visible at a considerable distance: thus the stooping, struggling form of the stalker worming a passage through an opening two feet square in an unyielding wall of thorns, or striving to free himself from the too firm embrace of a network of 'wacht-een-beetje' bushes, cannot fail to attract attention long before the little grey watcher, standing motionless in the shadows, has been discovered.

"At the bush-drives so common in the Colony, blue-buck are seldom turned out; they will keep such dogs as have not learned

wisdom of experience tearing round and round a kloof all day, but will never venture to break unless by chance a hard-pressed individual takes advantage of some narrow bush-strip at an unwatched, unthought-of point to escape by way of it into the next kloof. The blue-buck may be easily bagged, however, in the early morning by the exercise of a little judgment. The direction of the wind must be studied before all things, then search must be made for the most frequented 'paths' or 'runs.' Should one be found which is evidently a main path to and from certain feeding-grounds, this can be watched; but a surer method is to find a spot where they are accustomed to feed on the surrounding bushes. In such places many converging paths will be seen, in view of which, at a short distance down wind, the watcher must take his stand before sunrise, keeping out of sight behind a bush or fallen tree-trunk. Under such circumstances, his patience will not be severely taxed before he is rewarded by a sight of the little grey wood-elves. In localities where water is handy, the paths to and from it may be watched. In the heat of summer blue-buck frequently drink between noon and 2 P.M., but, as is the case with the bush-buck, in the extensive arid regions of this Colony the want of water troubles the blue-buck not at all; and during the trying drought which recently raged over the Gamtoos river district for fifteen months, countless numbers of both bush-buck and blue-buck certainly did not taste water from one week's end to another.

"In little-disturbed localities I have seen blue-buck playing about in pairs on fairly open ground bordering the kloofs so late as 8 A.M.; and towards evening, during the hour before sunset, they may often be seen standing in or crossing any quiet road which passes through scrub-bush. But they are very quick, and though in the dusk they will stand watching the intruder curiously, yet before the light fails they usually scuttle off very promptly, uttering their sharp, but by no means shrill, alarm-whistle. They are apt, however, soon to stand again, so that, if silently followed up, a shot may be obtained. When lying up for the day, they usually select spots overgrown with thorn-bush and other vegetation, reaching these from the more open bush in which they feed by regularly frequented paths.

"It will be remarked that while in many respects their habits are similar to those of the red duiker (*C. natalensis*), they entirely differ from the latter in their rigid avoidance of really open ground; for it is well known that the red duiker loves to disport himself on open grassy ridges 200 or 300 yards distant from any bush: I have shot many in such situations. 'Scuttle' is a word which aptly describes the move-

ments of a blue-buck when alarmed: unlike *C. grimmi* and *C. natalensis*, they do not bound away, but move at a quick scuttling trot.

"Blue-buck are almost entirely browsers upon bushes, and it is well known that in order to get at branches which are out of their reach when standing on the ground, they will raise themselves on their hind-legs like goats, resting their fore-feet against the tree-stem. Perhaps, however, the fact is now made known for the first time (if, indeed, it does not actually amount to the discovery of a hitherto unknown habit of this antelope) that the blue-buck can and does climb trees! My brother witnessed this singular feat when out stalking, and actually shot one as it stood on a branch, browsing on the leaves around. He was first attracted to the spot by the low grunting sounds they were making, but, though they were evidently close by, he failed to make one out after carefully scrutinising the surrounding bush. Advancing cautiously, he soon saw the leaves of a 'boer-boon' tree shaking violently, and for a moment believed it was caused by either baboons or monkeys: at last, to his surprise, he discovered a blue-buck moving along a branch of the tree some 12 feet from the ground. Although in pursuit of bush-buck, this opportunity of shooting a blue-buck under such peculiar circumstances was not to be lost, so he fired and killed it. At the report of the rifle at least eight other blue-buck dropped from the branches, apparently reaching the ground on all four legs at once, and scuttled off; while, as he stepped forward to secure the dead one, a male, another dropped apparently out of the tree under which he had knelt to fire the shot. That same morning he saw blue-bucks in four different trees. The boer-boon tree above mentioned rose from the ground at an angle of about 50°, but the blue-buck were not on the main trunk, but amongst the smaller branches. I regret that an accident prevented me from being with my brother that day; but he assures me he will be able to point out the spot another day, when he is confident I shall be an eye-witness of this singular climbing feat."

NYASA BLUE DUIKER

(*Cephalophus nyasæ*)

This species (or ? race), which was described by Mr. O. Thomas in the *Annals and Magazine of Natural History* for January 1902, vol. ix. p. 58, differs from the blue duiker by the larger amount of rufous on the limbs and body, and its narrower skull. The back is a darker brown than in the blue duiker, with a greater tinge of rufous; the

shoulders, flanks, and thighs are dull deep rufous, the under-parts greyish rufous, and the limbs, with the exception of between the main and lateral hoofs (where they are brown), bright rich rufous. The rump is dark chocolate-brown, and the under side of the tail still darker blackish brown; the forehead is, as usual, dark, with rufous brow-streaks, and the outer sides of the ears are brown, with a small rufous patch near the front of the base. A few white patches occur on the under surface between the two fore and the two hind legs.

The type specimens were obtained at Mlanje, Nyasaland.

HECK'S DUIKER

(*Cephalophus hecki*)

This duiker, which inhabits Mozambique, and was named in the *Sitzungs-Berichte Ges. Naturfor. Berlin*, 1897, p. 158, by Dr. P. Matschie, is distinguished from *Cephalophus nyasæ* by having more, instead of less, white on the under-parts, as compared with *C. monticola*; by being apparently less rufous on the body, and by lacking the usual dark markings on the back of the pasterns. The lateral hoofs are also smaller than in *monticola* or *nyasæ*. The legs are red, as in *monticola*.

THE URORI DUIKER

(*Cephalophus lugens*)

A member of the blue duiker group, but of larger size than *Cephalophus monticola*, *C. melanorheus*, or *C. æquatorialis*, and also darker in colour; its legs being brown, and thus different from those of *monticola* and *hecki*, which are red. The species is a native of Urori, British East Africa, and was described by Mr. O. Thomas in the Zoological Society's *Proceedings* for 1898, p. 393.

On the upper-parts the general colour is dark umber-brown, with the forehead and top of the muzzle nearly black, the unusually long crest black, the sides of the face brown, relieved by a whitish line above the eye, and the outer surfaces of the ears black in their front half. Neck brown, like the back, with the hairs on the nape reversed so as to incline forwards. Back darkening almost to black on the loins, but this darker area not relieved by a lighter patch on the outer side of the hip, as in *melanorheus* and *æquatorialis*, and the hips uniformly

brown, as in *manticola*. Under-parts and inner sides of fore-legs pale mouse-colour; chin, under surface of jaw, and groin whitish; limbs dark brown, like back.

EMIN'S DUIKER

(*Cephalophus emini*)

Under this title Dr. T. Noack (*Zoologischer Anzeiger*, vol. xxvii p. 405, 1905) has described the headless skin of a medium-sized duiker from East Central Africa, probably west of the Victoria Nyanza. It is characterised by the unusually long hair, which on the back is rufous brown; and the presence of a yellow ring on each hair of the under-parts and limbs, which communicates a speckled brown and yellow appearance to the coat of these parts.

THE KLIPSPRINGER

(*Oreotragus saltator*)

Klip-bok, CAPE DUTCH; *Ligoka*, ZULU, SWAZI, AND MATONGA; *Ikumi*, BASUTO; *Ingululu*, MAKALAKA; *Alakad*, SOMALI

(PLATE vi, fig. 8)

With the well-known and unmistakable "rock-jumper" we come to another subfamily (*Neotraginæ*) of antelopes, containing several generic groups, all restricted to Africa. They are all small or medium-sized species, with either naked or trunk-like and hairy muzzles, large face-glands opening by a circular orifice, and a short or medium tail. The lateral hoofs may or may not be present; and the horns, which are wanting in the females, are short, nearly or quite straight, and rise vertically or with a backward inclination, their bases being ridged and the tips smooth.

From the other members of the group, the klipspringer, which is the only representative of its genus, is readily distinguished by the thick pithy hair, the rudimentary tail, and, above all, by the rounded and blunt hoofs, upon the tips of which the animal alone stands. The nearly vertical horns have a slightly forward curvature, and are ringed for the basal third of their length.

The main hoofs, which are relatively large, rise almost vertically from the ground when the animal is in a standing posture; and well-

developed lateral hoofs are present. In texture the hairs are comparable to those of the Asiatic musk-deer; while in colour they are olive-grey tipped with golden yellow, thus giving to the whole coat its peculiar and characteristic speckled appearance. The ears are large for so small an animal, attaining in the race from the north of the Zambesi a length of about 4 inches, or rather more. In height bucks stand from about 20 to 22 inches at the shoulder, and does from 18 to 19 inches. The record horn-length is $5\frac{3}{8}$ inches, but 4 inches is a good average length.

Klipspringers are found in rocky and mountainous districts over a large area in southern and eastern Africa, from Cape Colony to Abyssinia, inclusive. The species has been split up into the following local races by Mr. O. Neumann in a paper published in *Sitzungs-Berichte Ges. Naturfor. Berlin*, 1902, p. 169:—

The first is the typical Cape Colony race (*Oreotragus saltator typicus*), of which the northern limits are not yet ascertained. It differs from all the others in having the whole body of one uniform colour, with the under-parts somewhat lighter than the back, and the absence of a black patch on the front of the fetlocks just above the hoofs, and of a white spot on the outer side of the ears; the general colour being brownish olive, and the spot on the outer side of the ears yellow. The ears are shorter than in the races to the north of the Zambesi.

The Abyssinian race (*O. s. saltatrixoides*), which has a wide range in north-east Africa, exclusive of Somaliland, agrees with all the following in having white under-parts, a black patch on the front of the fetlocks, and a white spot on the outer side of the ears. It is specially characterised by the uniformly greyish olive of the upper-parts, the white or whitish bases of the hairs, especially on the back, and by the body-colour extending on to the thighs, which are only a little lighter than the back.

Nearly allied is the Masai klipspringer (*O. s. schillingsi*), from British and German East Africa, in which the thighs are distinctly different in colour from the body, being clear grey or rufous, while the middle line of the back is very dark. From both the above the Somali race (*O. s. somalicus*) differs by having the bases of the hairs, especially on the back, reddish grey or reddish brown.

Finally, the Nyasa klipspringer (*O. s. aceratos*) differs from all the rest in that the fore-quarters are reddish or ochery yellow, and only the hind-quarters olive (or roebuck-colour, as Mr. Neumann calls it).

The following account of the klipspringer in southern Africa is slightly abbreviated from one written by Mr. Vaughan Kirby:—

"In Cape Colony klipspringers are far less numerous than formerly, but throughout Swaziland, the Transvaal, Mashonaland, Matabililand, and Bechuanaland they are still plentiful. By no means confined to the impossible 'krantzes' of mountain-ranges, they are found throughout the 'low country' amongst stony bush-covered 'kopjes,' rising from the flats; and on several occasions I have found them many miles from any hills, among the piled-up boulders of river-beds. They are common along the Mehlamhali river of the eastern Transvaal; and when disturbed, merely run up or down the river among the stones. Klipspringers seldom lie high up on the kopjes during the day, but invariably seek the cool shade of the bush below, or of some deep 'kloof,' and when disturbed, dart off up the hill-side. They are grass-feeders, and associate in pairs, though several may be seen moving about at once on a hill-side. The only klipspringer fawn I ever saw was in August, the little creature being scarcely a month old and pale yellow in colour; I think, however, that, in common with those of most African antelopes, the young are usually born between September and January, when the new grass comes on. The flesh is excellent.

"In certain localities the pursuit of the klipspringer is somewhat arduous—particularly on high mountain-ranges and among steep krantzes. These antelopes, although wary, are not difficult to shoot, as they often stand several times after being disturbed. In the 'low country,' when put out of a patch of bush, they at once run up the nearest 'kopje,' and usually stand on the first large boulder, thus offering an easy shot. A sharp whistle will often cause them to pull up, even when racing at full speed up the hill-side. Dogs that know their work soon bring them to bay, driving them higher and higher, till the highest pinnacle is reached, when the dogs stand round the quarry. I have, however, seen klipspringers escape from such an awkward dilemma by boldly leaping over the heads of the dogs and making off. Klipspringer-stalking is decidedly pretty sport, affording healthful exercise amidst charming scenery. On level ground they cannot run quickly, and a good dog will pick them up in a short distance. On one occasion, when following a klipspringer whose escape my 'boys' had cut off below and the dogs above, one of the latter, ranging ahead, came round the hill-side in front, when without hesitation the little creature leaped from the edge of the krantz to a ledge below, and, running obliquely down the steep rock-wall, passed far in front of the boys and escaped. Although I did not measure the drop, I am sure it was over 30 feet from the krantz to the ledge, and as the krantz overhung, it was a clean leap. It is, however, when climbing a hill that the

marvellous agility of these antelopes is most apparent, as they will race up the smooth face of slippery rocks, so steep that no other animal than a baboon could find a footing."

In Somaliland, according to Mr. J. D. Inverarity, klipspringers frequent the Golis range, and are generally seen at the tops of the ridges of the hills where there are large boulders. They may, indeed, be seen sometimes in the bush low down in a ravine, but as a rule they are near the rocks. As an old male shot by this sportsman measured only 18 inches at the shoulder, and 3 feet from the tip of the nose to the end of the tail, the Somali klipspringer may be smaller than the typical Cape animal.

THE ORIBI

(*Oribia scoparia* [1])

Ouribikje, CAPE DUTCH; *Iula*, ZULU, SWAZI, AND MATONGA; *Pulukudukamani*, TRANSVAAL BASUTO; *Chisimbi* (in common with other small antelopes), LOWER ZAMBESI.

(PLATE vi, fig. 9)

The oribis, the largest representatives of the *Neotraginæ*, have, in common with the following genera, the hair and hoofs of normal form and structure; while the extremity of the muzzle is naked, and the crown of the head carries no tuft of hair. As special characteristics of the oribis may be noticed the existence of a bare glandular spot beneath each ear, the presence of lateral hoofs, and the large size of the pits in the skull for the reception of the face-glands. Tufts of hair are developed on the knees, and the short tail generally has a black tip. The horns, which are about one-fourth shorter than the skull, slant backwards, and show considerable specific variation in the degree of development of the basal ridging.

In the true, or Cape, oribi, the horns, like those of all the other species except *Oribia haggardi*, are relatively slender, and slightly ridged for a distance of some two inches above the base. The species, which is yellow-fawn colour above and white below, sometimes with a rufous tinge on the back, is further characterised by the presence of a blackish patch on the forehead between the horns, and also by the tufted and moderately long tail having its terminal two-thirds black. The shoulder-

[1] Also known as *Ourebia ourebi*.

height is from 24 to 27 inches, and the average length of the horns about 4 inches, although a length of $7\frac{1}{2}$ inches is on record.

"These little antelopes," writes Mr. F. Vaughan Kirby, "range from the south-eastern portions of Cape Colony through Natal, Zululand, the Orange River Colony, and the Transvaal. They are fairly numerous in parts of Bechuanaland, on the north side of the Chobi river, as well as in north-east Mashonaland, while they are abundant on the open downs of Manicaland, and in Portuguese East Africa. Oribi are equally at home on the lofty summits of the Drakensberg, among the rolling foot-hills, and on the sweltering plains of the Pungwi and Urema rivers in Portuguese East Africa. At the higher elevations they frequent the most open ground, lying in grassy hollows, or sheltered slopes, or among out-cropping rocks; but in the low country they are found among palm-groves and in dwarf scrubby bush. They associate in pairs or in small parties of three or four, and when disturbed dart off at a rapid pace, running low for about 30 yards, and then commencing to spring into the air, alighting each time first upon their hind-legs. Oribi fawns are usually born about Christmas, although I have seen many in Portuguese East Africa which appeared fully two months old at the end of November.

"Oribi-shooting with the rifle is excellent sport. Formerly we used to hunt on horseback, and ride into the patches, dismounting as the game jumped away, and taking the shot as quickly as possible; but better sport may perhaps be obtained on foot if the grass is not too long. The oribi may be seen standing or feeding; but on discovering the sportsman they immediately lie down, when the latter must manœuvre round them, approaching nearer and nearer, and being ready to fire immediately they jump up. When on foot, the sportsman should carefully survey the ground ahead with glasses—especially sloping hill-sides—as an oribi, with its yellow coat, is, though small, a conspicuous object; but practice is required to distinguish between the small yellow ant-heaps and the game. Oribi have a great turn of speed, and only good greyhounds will run them down. The flesh is excellent eating, but, like that of all the smaller antelopes, requires well larding."

The tracks or "spoor" of the oribi are heart-shaped, in which respect they resemble those of the undermentioned steinbok and grysbok. In the steinbok the length of each hoof-print is one inch, but in the oribi it is rather more, while in the grysbok it is slightly less.

PETERS'S ORIBI

(*Oribia hastata*)

Insa, MANGANJA

This, the Mozambique and Nyasaland representative of the oribi, differs from the latter merely by the larger size of the bare ear-patch below the ear, and the more slender and less heavily tufted tail, which has a variable amount of white on the edges of its under surface. Such slight differences indicate that the present animal, like its Abyssinian relative, might well be regarded in the light of a local race of the typical oribi, rather than a distinct species. A male shot by Mr. Percy Rendall measured 21½ inches at the shoulder, and weighed 35 lb.; the corresponding items in the case of a female being 21 inches and 33 lb. The presence of a glandular pouch between the hoofs is noticed by the same sportsman, who also states that these oribi are always found in the open, where they spring up out of the long grass when disturbed in the same fashion as a steinbok.

To the west this oribi ranges into Barotseland and Mashonaland.

THE GAMBIAN ORIBI

(*Oribia nigricaudata*)

Gebari, GAMBIA

The western representative of the group comes very close to the next species, but is of rather smaller size (21 inches at the shoulder), and has the large ear-patch of *hastata*, while it is further distinguished by its greyer colour, and the presence of a distinct black tail-tip, like that of the Cape species. The top of the muzzle is brown, and the length of the ear 3.4 inches.

The open districts of the Gambia and Senegal are the home of this oribi, of which the habits are doubtless similar in all essential points to those of other representatives of the group.

THE ABYSSINIAN ORIBI

(*Oribia montana*)

Facko AND *Miwaka*, ABYSSINIAN ; *Mori* OR *Loyik*, DINKA

The oribi of Abyssinia and Bogosland comes close in general characters to the Cape species, but has a shorter and less tufted tail, with only a few sparse black hairs. The height in the buck ranges from 22 to 23½ inches at the shoulder, and the weight may reach 38 lb. The maximum recorded horn-length is 5⅜ inches. Yellowish fawn above, and yellowish white or white below is the general colour.

The range includes part of the Sudan in the neighbourhood of the White Nile.

Writing of these antelopes in his book on Abyssinia, Major Powell-Cotton observes: "I first saw them near Rogge, on the road to Adis Ababa. I noticed none at Turkogogo, but they are found at Zoquala, in the Hawash valley, due south of the capital. After I started north, the first place they were met with was one march from Dungoler on 27th March 1900. The natives said there were none to the south, but that I should find many more to the north, which proved to be the case. They are found in both the highland and low, hot country; the coat being lighter in colour and naturally much shorter in the latter. Most often in couples, generally two females, though sometimes a pair; little groups of three, four, and five are fairly frequent. Nearly always among bush, they have a trick of sneaking off when they first catch sight of danger, and lying down in the nearest little bit of covert available, where they could often be made out lying with their heads close to the ground. They are wilder and more difficult to get near than duiker."

Vicomte Edmond de Poncins gives the following description of their habits:—

"The chief food of this oribi is dry grass and mimosa-leaves, as it is most frequently found on grassy plains more or less dotted with mimosa, and often upon plains where no trees at all, not even a bush, are to be seen for miles. On the Shoa plateau I frequently saw them on the lower slopes of grassy hills, but never in really rocky or steep places. On the Galla plain, at the foot of Mount Zokioïla, on the southern side, they were, in May 1897, exceedingly common. The

habitat of the bohor antelope seems to be also the favourite ground of the Abyssinian oribi; both species being often seen near one another, although they do not appear to herd together. In this district I saw certainly over fifty a day, and had no trouble in picking up about a dozen oribi in four days' shooting, although I was looking specially after bohor.

"These little antelopes are, as a rule, to be seen in small parties of from three to six; only once did I see seven together; nearly always they were in twos or threes. At morning and evening they may be

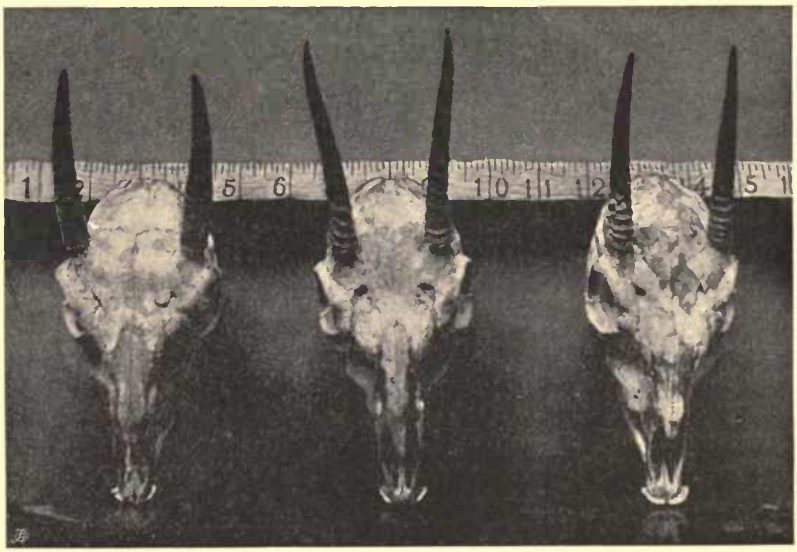


FIG. 39.—Skulls and Horns of the Abyssinian Oribi.

seen grazing in the open. The females are often bigger than the males, and without glasses these bucks are rather difficult to make out, as the ears are kept along the horns, and thus screen them from the hunter. These oribi are not very timid unless much shot at.

"In the hottest hours of the day they lie down in dry grass about 3 to 4 feet high, and more often in the shade of the dwarf mimosa, which stands isolated in the middle of the plains. Sometimes they are lazy and do not care to move except when one is passing quite near; but as a rule they jump off about 60 yards away. When a strong wind was blowing I often managed to shoot them with a shot-gun by working slowly against wind in the most likely places. With

the .303 rifle they afforded capital sport. The oribi is a small mark, and when jumping in high grass quite difficult enough to give very good practice. Taken all round, this is an excellent little game-animal, and to it I owe many a pleasant day and many a good dish at dinner, when resting myself and caravan at Adis Ababa."

THE KENIA ORIBI

(*Oribia kenyæ*)

Taya, SWAHILI

The oribi of the Mount Kenia district of British East Africa was described under the above name by Captain R. Meinertzhagen in the Zoological Society's *Proceedings* for 1905 (vol. i. p. 169). In the original description this species, which stands from 23 to 25 inches at the shoulder, is stated to come nearest to Haggard's oribi, but to differ in the following points :—

The horns are not so thick and less roughly and irregularly ridged, while they have a more forward inclination, and are more divergent. The general colour is bright fulvous, or ochery tawny, with the chin and throat white, a white streak above the front part of each eye, continuing for about an inch in the direction of the muzzle. The ears are fringed above with dark brown ; and the tail, which is about four inches long, has the terminal three-quarters thickly tufted and black, and the basal fourth edged with white below.

The following account, by Mr. F. J. Jackson, of the oribi inhabiting the Kavirondo district, east of the Victoria Nyanza, probably refers mainly, if not exclusively, to this species :—

" This oribi has so far not been found east of the Mau escarpment. It is abundant on the rolling grassy downs from an altitude of 7500 feet right away on the shores of the Victoria Nyanza in Kavirondo, and is found on the banks of both the Sir and Nzoia rivers. In Kitosh and Tarkarel it is also abundant, but is certainly more common in Nandi than elsewhere.

" This little antelope is found singly or in small lots of two or three together, male, female, and young. Occasionally five or six may be seen together. They are essentially denizens of the open, and at all times avoid bush and other thick covert. During the heat of the day, and when the grass is long and withered, they are rarely seen

unless disturbed, as they lie down about 8.30 A.M., and are not on the move again until 3.30 or 4 o'clock in the afternoon. On the Mau down, for practically half the year, that is from June to December, one might go for days without seeing one, owing to their size and colour assimilating so closely with the length and shade of the grass. They lie very close, like a duiker, and will almost allow themselves to be trodden on ; but when they do move, they go off with such a rush, and double from side to side so quickly, that it is almost impossible to see them until they have gone some distance, when they will bound up into the air, no doubt to see where they are going, and if there is danger ahead. These bounds are only taken in long grass. During the rest of the year, when the grass is short and green, they are very conspicuous and can be seen at long distances.

"No buck of its size affords better sport than the oribi, and certainly few, if any, can compare with it, if the main object of its pursuit is for the 'pot.'

"Any one wishing to stalk them should be out early and on the ground between daylight and 8.30 A.M. ; and, if the wind will allow him to do so, he should work the ground with the sun at his back or on one side, as they are then so much easier to see. The evening between 4 P.M. and sundown is, if anything, a better time, as the wind is likely to be much steadier, and the sun, being low down, makes them show up quite as well as in the morning.

"The localities in which this antelope is found are usually well adapted for stalking. Even on the Mau plateau, after a recent grass-fire, there is sufficient covert in the shape of innumerable small ant-heaps ; while in Nandi, Kavirondo, Kitosh, and Tarkarel there is sufficient scrub to hide the stalker if he takes ordinary care. It must not be supposed, however, that because this little antelope is in the habit of lying very close in long grass, and almost allowing itself to be trodden on, and of standing quite still intently gazing at the intruder, hoping thereby to escape observation, it is at all times easy to approach without the usual precautions being taken in regard to wind, keeping out of sight, etc. When once alarmed, though they will as a rule not go far, it is well to give them time to settle down before following in the direction they were seen to go, as they are very wary, and much given to doubling about to the right or left of the line of their retreat. Often have I seen them bounding away to one side, and almost on a level with me, when all the time I expected to see them somewhere straight in front. If sought after when the grass is long, it is better to go out when the sun is well up and they

are lying down, as their habit of lying so close will allow of a very near approach. Under these circumstances a rifle is practically useless, and better results will be had with a gun and B.B. or S.S.G. shot, by shooting a trifle ahead of the moving grass, the oribi being usually visible for the first 30 or 40 yards, or by waiting until they bound into the air, when they must be taken on the hop. When hit and wounded only slightly they will lie down within a short distance, if not almost at once. They are, however, very tenacious of life, and will go off and sometimes get clean away with the most terrible wounds. A dog is invaluable for this kind of shooting. Their note of alarm is a sharp, shrill whistle very like that of a reed-buck."

HAGGARD'S ORIBI

(*Oribia haggardi*)

Taya, SWAHILI; *Nsilatso*, UGANDA

This oribi, which was discovered in 1887 by Mr. J. G. Haggard near the coast in the Lamu district of south Somaliland, and described by Mr. O. Thomas in the *Annals and Magazine of Natural History* for 1895 (vol. xv. p. 187), differs from all the others by the stouter horns, which are heavily ridged for about half their length from the base. The shoulder-height is about 24 inches, and the maximum horn-length $6\frac{3}{8}$ inches.

Writing of this species a few years ago Mr. F. J. Jackson observed that "the East African or Haggard's oribi is, so far as we yet know, confined to the coast-regions, and is not found far inland, the furthermost point where I have myself seen and shot it being Maji Chumvi, a place in former times two days' march west of Mombasa, but now about an hour's run by rail. Near Mambini I have seen its spoor, but at Merereni, some 15 miles farther north, I saw none, though the country appeared well adapted to its habits. On the banks of the Tana river it was seen and shot by Sir Robert Harvey and Mr. H. C. V. Hunter in 1888. The Witu district is, however, its chief habitat, and during the years 1885 to 1887 I saw large numbers when shooting in the vicinity of Mkowambi, Jipi, and Taka. In the last-named place it was very abundant. In habits it differs in no way from the other members of the genus, excepting perhaps in its partiality for the vicinity of human habitations, or rather for the cultivation, which no

doubt affords a pleasant change of diet when the young corn is beginning to appear."

An oribi from near the north end of the Albert Nyanza has, however, been provisionally referred to this species, which may occur also in the Kavirondo district.

GOSLING'S ORIBI

(*Oribia goslingi*)

An oribi from the upper part of the Welle Valley, in Congo territory, described by Messrs. Thomas and Wroughton in the *Annals and Magazine of Natural History* for 1907 (ser. 7, vol. xix. p. 387), agrees in size with *hastata*, being larger than *kenyæ*, and having longer horns than *montana*, while it is further characterised by the presence of a conspicuous black patch on the forehead between the horns and extending to the base of the ears. The coat of the back has a darker tinge than in other species.

With the exception of a smaller one in a specimen referred to *montana*, no other oribi but the Cape species has a similar black patch on the forehead; and geographical considerations indicate the distinctness of these two animals. The larger size of its skull distinguishes the present species from both *montana* and *kenyæ*; while from *hastata* the species is differentiated by certain peculiarities in the form of the skull as well as by the black horn-patch.

COTTON'S ORIBI

(*Oribia cottoni*)

Under this name Mr. O. Thomas has described in the *Annals and Magazine of Natural History* for 1908 (ser. 8, vol. i. p. 177) an oribi brought home by Major Powell-Cotton from the Guashengisha plateau (lat. 1° N., long. 35° E.), in Central Equatorial Africa. It is described as being about the size of *Oribia goslingi*, but with the fur rather longer, and the general colour paler and brighter above, being tawny fading to buff on the flanks, whereas in the western species it is dark clay fading to ochery. Individual hairs of the back are drab for the basal two-thirds, and buff for the remainder of their length, with minute black tips; while in *goslingi* they are pale smoke-grey below, and

dark brown terminally, broken by a bright buff ring below the black point. The dark frontal blaze characteristic of the latter species is almost entirely absent in *cottoni*. The tail is very short, less than one-third the length of that of *goslingi*. The horns are stout and well-ridged, as in the Welle species, but not equalling those of *O. haggardi* in this respect.

The skull is broader, stouter, and shorter in front of the sockets of the eyes than in Gosling's oribi. The shoulder-height is about 23 inches, and the weight 38 lb.

Inclusive of the present animal, there are now known to be four types of oribi in north-eastern Africa, viz.—

O. montana in Abyssinia and the Sudan, occupying the whole area down to 5° N. latitude, and distinguishable by its short slight horns; *O. haggardi* on the coast; *O. kenyæ* round Mt. Kenia; and *O. goslingi* from the Welle basin.

Of these *O. kenyæ*, by its black tail and narrow pit in front of the eye, shows affinity with the more southern *O. hastata*, from Mozambique; while *O. haggardi* differs from all the rest by its shallow skull and the compression of its horns posteriorly so as to make a more or less distinctly marked longitudinal ridge. From *O. montana* the present species is separable by its long stout horns, while from *O. goslingi* it differs in wanting the black patch on the face, characteristic of that species.

THE GRYSBOK

(*Rhaphiceros melanotis*)

Grysbok OR *Grys Steinbok*, CAPE DUTCH; *Inhlengana*, SWAZI AND MATONGA; *Isikupi*, TRANSVAAL BASUTO; *Kulu*, MAKUA; *Timba*, MAKALALA.

(PLATE vi, fig. 10)

The grysbok (pronounced rysbok) and its relatives form a group distinguished from the oribis by the absence of a bare patch below the ear, and by the smooth horns rising nearly vertically from the head, as well as by the small size of the pits in the skull for the face-glands. Knee-tufts are wanting; but the lateral hoofs may be present or absent.

The grysbok is characterised by the presence of small lateral hoofs coupled with a speckled coat. In general colour the upper-parts are deep chocolate-red abundantly stippled with white (owing to the inter-

mixture of white with the red hairs); this stippling extending on to the forehead and back of the neck, but absent from the cheeks, sides of the neck, throat (which is rufous yellow), chest, and under-parts generally, the latter being a paler rufous than the back. The ears, which are large and pointed, are brownish grey externally, and the tail is short. Bucks stand about 22 inches at the shoulder, and 23 at the croup, but does are stated to be half an inch taller. Ordinary horns average about 3 inches, but there is a record length of $4\frac{7}{8}$ inches.

The range of this species includes South Africa as far north as the Zambesi and Mozambique.

Mr. Vaughan Kirby writes that at the present day the grysbok "abounds throughout the south-eastern districts of Cape Colony, though rare in Zululand, Natal, and Matabililand. It is fairly numerous in parts of Mashonaland, Gazaland, and the eastern Transvaal, particularly near Komati-Poort and along the Letaba river. I did not meet with it in the Mozambique Province, but in Portuguese South-East Africa it is comparatively common. It is found singly or in pairs, usually in hilly districts, where it is partial to open hill-sides with a sprinkling of thin bush and low scrub. It lies very closely in covert, and, unlike its congener the steinbok, seldom stands after it has once made off. Grysbok can exist for a long period without water, and I have seen them in waterless localities. They are amongst the first to retire to covert in the morning, and leave it late in the evening. During the day they lie up in patches of bush, in gullies, or on sloping hill-sides, and in the low country are partial to the rough scrub-covered ground at the bases of low 'kopjes.' They are purely grass-feeders, and their flesh is excellent for the table. The fawns, which are slightly darker in colour than the adults, are usually born at the beginning of the rains; but in Cape Colony, where the seasons are very changeable, they may be produced during any month in the year. The only cry I have heard them utter is a loud bleat when seized by a dog. They are by no means swift; but, owing to the rough, bushy nature of the country they inhabit, only a good dog will run them down. Grysbok can either be shot during an early morning's stalk, when it is no hard matter to get within easy range; or they can be walked up—one or more guns taking a line of country and getting their shots in as the bucks jump up. When running straight away, their plump sterns offer a fairly easy mark, as they run far more smoothly than either duiker or steinbok."

Professor Knotterus-Meyer (*Archiv Naturgeschichte*, vol. lxxiii. pt. 1, p. 99, 1908) has proposed to generically separate the present species

from the steinbok under the barbarous name of *Grysbock melanotis*. If, however, such a course be deemed necessary, it is the steinbok which should be separated from *Rhaphiceros*, as has been proposed by Messrs. Thomas and Schwann (see next page).

SHARPE'S STEINBOK

(*Rhaphiceros sharpei*)

Discovered in Angoni, Nyasaland, by Sir A. Sharpe in 1896, and described, with a coloured plate, by Mr. O. Thomas in the Zoological Society's *Proceedings* for the same year (p. 796), this species serves to link the grysbok and steinbok so closely together that a generic separation between them seems uncalled for. Sharpe's steinbok has, in fact, the stippled coat of a grysbok coupled with the absence of the lateral hoofs distinctive of the steinbok.

FIG. 40.—Skull and Horns of Sharpe's Steinbok.

This species, which appears to be rather smaller than the steinbok, has the coat a rich tawny rufous speckled with white hairs above; the colour being brighter than in either of the allied species. The brown muzzle, although darker in the middle, shows no distinct nose-patch; but there are crescentic black markings on the crown of the head, as in the steinbok. The ears, which are large, are thinly covered with sparse and mostly whitish hairs. The short tail is coloured like the back above and white below; while the under-parts and limbs resemble those of the steinbok in colouring. The horns are very short and conical.

This steinbok is, as we have seen, typically from Nyasaland (including northern Rhodesia), whence it extends into Barotsiland. South of the Zambesi it is represented in the north-eastern Transvaal by *Rhaphiceros sharpei colonicus*, a local race described by Messrs. Thomas and Schwann on p. 584 of the Zoological Society's *Proceedings* for 1906. Compared with the typical *sharpei*, it has rather longer feet, and its colour is somewhat richer and more purplish, with a larger intermixture of white hairs. The throat, chest, and under-parts are purplish buff, in place of white or whitish with a mere tinge of buff. In stature the Transvaal slightly exceeds the Nyasa race. The former is found on grassy hill-sides dotted with trees.

THE STEINBOK

(*Rhaphiceros campestris* [1])

Steinbok, CAPE DUTCH ; *Ingeina*, ZULU, SWAZI, AND MATABILI ; *Ipurupuru*, BECHUANA ; *Ipulupudi*, TRANSVAAL BASUTO

(PLATE vi, fig. 11)

The absence of the lateral hoofs coupled with the uniformly coloured coat of the upper-parts serves to distinguish the steinbok from each of the two preceding species. The general colour of the coat on the upper-parts is reddish fawn or sandy rufous in the typical race, tending more or less to brown in some individuals and silvery grey in others, with a crescentic black mark on the crown of the head, and the face rather brighter in tint than the rest of the coat. The under-parts are whitish, with a faint tinge of buff. The height is about 22 inches. The horns do not usually average more than about 4 inches, but there is a well-authenticated record of 6 inches, while one pair is stated by its owner to be still longer.

The typical race of the steinbok ranges over the greater part of Africa south of the Cuneni and Zambesi rivers. In the north-eastern Transvaal it is represented by a local race *Rhaphiceros campestris capricornis*,[2] which comes nearer to the under-mentioned Nyasa race than to the typical Cape form. Indeed, it differs from the Nyasa race merely by certain features in the skull, and apparently by the retention of faint traces in does of the dark horse-shoe mark on the head.

North of the Zambesi the Nyasa race (*R. c. neumanni*[3]) is distinguished from the typical Cape steinbok by the absence of the dark crescentic mark on the crown of the head, the paler general colour, and the greater extent of the white face-markings. The eyes, for instance, are completely ringed with white, the lips are white, and there is a greater extent and purity of the white on the chin, throat, and limbs. The skull also is slightly larger.

Writing some years ago of his experiences of this antelope, Mr. Vaughan Kirby observed that—

[1] Made the type of the genus *Nototragus* by Messrs. Thomas and Schwann, *Abstracts Proc. Zool. Society*, 1906, p. 10.

[2] Described in *Proc. Zool. Soc.* 1906, p. 584, by Messrs. Thomas and Schwann as a race of *R. neumanni*.

[3] Described by Dr. P. Matschie in *Sitzungs-Berichte Ges. Naturfor. Berlin*, 1894, p. 122, as *Pediotragus neumanni*.

"The steinbok is distributed widely over South Africa, from the Cape to the Zambesi, although in the south-eastern portions of Cape Colony its place is taken by the grysbok. It is not found, however, in mountainous districts or in dense forest-belts, being partial to open flats, rolling grassy downs, and thin forest. In Portuguese East Africa I found these antelopes fairly numerous along the Pungwi river, and on the flats below Gorongoza, west of the Urema river; but, singularly enough, on the vast Urema plains, to the east of that river and north of the Mwaredsi, I did not meet with a single specimen. Neither did I see any in the Mozambique province. Like grysbok, steinbok appear to be independent of water, but if it is anywhere near they will drink. Seeing that they are grass-feeders, it is somewhat difficult to know how they subsist without it; if leaves formed portion of their diet they might supply the want by eating those of a watery, succulent nature. Steinbok lie very closely in covert, or even in the open, usually stretching their necks out in front of them on the ground; but they spring to their feet with wonderful rapidity when they decide upon flight. They often scratch up the ground with their hoofs, particularly near the spots where they deposit their droppings; but as this is also done in other places, it is possible they may occasionally eat small succulent roots and bulbs. I cannot recollect seeing a very young fawn, but since the spring is the rutting-season, there is no doubt that the young are born about Christmas.

"In parts of Bechuanaland and Cape Colony steinbok are regularly hunted with foxhounds, or coursed with greyhounds; and as they have plenty of pace and staying power, they give good sport. In the low country, early morning is the best time for shooting them. When alarmed on their feeding-grounds, they seldom run far before standing, but if they show no inclination to do so, a sharp whistle will often bring them up standing."

(*Rhaphiceros horstocki*)

Some years ago Dr. F. A. Jentink gave this name to a grysbok skin in the Leyden Museum which appears to be in such bad condition that its true characters cannot properly be determined. The name is, however, accepted as valid by the Hon. Walter Rothschild, who on p. 237 of the Zoological Society's *Proceedings* for 1908 refers a specimen from the neighbourhood of Drakensberg, Natal, to a local race of that nominal species, under the title of *Rhaphiceros horstocki natalensis*. The description is as follows:—

"Differs from *R. horstocki* in its much darker colour. The white patches on the throat and round the eyes much smaller, and the white on the belly less extended. The whole of the rest of the body dark vinaceous rufous instead of orange rufous."

THE ROYAL ANTELOPE

(*Neotragus pygmæus*)

Sang, LIBERIAN

(PLATE vi, fig. 13)

With this species, the typical representative of the subfamily *Neotraginæ* and the smallest of all true ruminants, we come to a group which may be collectively designated pigmy antelopes. As there is some difference of opinion with regard to the best mode of classifying the group, I may quote a note I communicated on this subject to the *Field* newspaper in 1906.

In that year "Colonel J. J. Harrison brought back from the Semliki Forest the skull and skin of a pigmy antelope, which, on examination, proved to be near akin to one from the Cameroons described a few years previously by Mr. W. E. de Winton as *Neotragus batesi*, although in the opinion of Mr. O. Thomas, as expressed in the *Annals and Magazine of Natural History* for August 1906, it is entitled to rank as a distinct genus. In describing the Cameroon pigmy antelope Mr. de Winton pointed out that it was in some respects intermediate between the royal antelope (*Neotragus pygmæus*) of Guinea and Fanti on the one hand, and the suni antelopes (commonly known as *Neotragus moschatus* and *N. livingstonianus*) on the other. Although Mr. Thomas accepted this view, he proposed to refer the Cameroon and the Semliki antelopes to a new genus—*Hylarnus*—assigning the name *H. harrisoni* to the last-named. A simpler course is, however, to revert in some degree to the view of Sir Victor Brooke, as expressed in his well-known paper on the royal antelope in the Zoological Society's *Proceedings*, and to include both the pigmy antelopes and the sunis in the original genus *Neotragus* of Hamilton Smith. We shall then have the following five species, viz.: *N. pygmæus*, of Guinea and Fanti; *N. batesi*, of the Cameroons; *N. harrisoni*, of the Semliki Forest; *N. livingstonianus*, of Mozambique; and *N. moschatus*, of the small islands near Zanzibar. Such an arrangement accords exactly with geographical

distribution, the most distinct forms occurring at the two extremes, and the intermediate ones in the middle of the series."

The pigmy antelopes are nearly related to the grysbok group, but their horns, which may not project behind the back of the head, slope backwards in or near the plane of the forehead, and the gland-pits in the skull are large. Lateral hoofs are always wanting.

The royal antelope, which has been known in Europe since the year 1704, is distinguished not only by its very diminutive stature (shoulder-height about 12 inches), but by the extreme shortness of the horns of the bucks, which do not project behind the back of the head, coupled with the absence of unossified spaces in the skull between the eye-sockets and the nose-bones. The general colour of the upper-parts is bright rufous fawn, browner on the head and fore part of the back, and richer in tone towards the rump. In contrast to this is the white of the chin, throat, under-parts, and a line on the hind surface of the fore-limbs and another on the front of the hind-limbs. The tail, which is short and tufted, is bright rufous above, but white at the tip and beneath.

Well known from Guinea and Fanti, this tiny antelope apparently ranges along the west coast from Liberia to Ashanti.

By Bosman, of Utrecht, who referred to it in 1704, this antelope was reported to be known to the natives as the "king of the harts," whence, no doubt, the name of "royal" by which it is now known. It is found in pairs in the thickest forests of the west coast, and is extremely active, starting off when disturbed in leaps which, it is said, may cover nine feet each.

BATES'S PIGMY ANTELOPE

(*Neotragus batesi*)

This species, which was first described by Mr. W. E. de Winton in the Zoological Society's *Proceedings* for 1903 (vol. i. p. 192), is to a great extent intermediate between the royal antelope and the sunis. With the latter it agrees in having an unossified space on each side of the skull in advance of the socket of the eye; but in the shortness of the muzzle it resembles the former. The short horns, which incline backwards in the line of the profile of the forehead almost as in the royal antelope, are stout, conical, and smooth, except for a short distance at the base, where they are slightly roughened. In size the

species is about half as large again as the royal antelope; from which it is also distinguished by its darker and rather more smoky colouring, the less rufous feet, and the less pure white of the under-parts. The front of the face, the crown of the head, and the neck are dark smoky brown, while the back and the upper surface of the tail tend more to rufous or bay, the individual hairs being everywhere ringed with dark brown and bright bay.

The home of this elegant little antelope is the Cameroons.

HARRISON'S PIGMY ANTELOPE

(*Neotragus harrisoni*)

This, the eastern representative of the East, is a native of the Semliki Forest in East Central Africa, whence a skin and skull were brought by Colonel J. J. Harrison in 1906. These were described by Mr. O. Thomas in the *Annals and Magazine of Natural History* for the same year (ser. 7, vol. xviii. p. 149) as *Hylarnus harrisoni*. Externally this species is very similar to the last, the main difference being the greater intensity of its colouring, so that its rufous areas are darker and the pale areas lighter than in the western animal. The reasons for including this and the preceding species in *Neotragus* are mentioned on p. 183.

THE SUNI

(*Neotragus moschatus*)

Suni, KILIMANJARO DISTRICT

(PLATE vi, fig. 12)

With this pigmy antelope we come to the first of two species which, while agreeing with the last in the presence of a large unossified space some distance in advance of the socket of the eye, differ by the longer and more upright horns, which may be half as long as the head, or more, and are strongly and closely ridged. The muzzle is also relatively longer than in the three preceding species. The typical suni, which stands from 13 to 14 inches at the shoulder, is specially distinguished by the short and slender horns (of which the maximum

length is $3\frac{7}{8}$ inches) of the bucks, and the general greyish-brown colour of the upper-parts, inclusive of the tail-tip. As in all the members of the group, the under-parts are white.

This species is a native of two small islands near Zanzibar and the adjacent mainland from Kilimanjaro to Mozambique. Its specific name refers to the strong odour of musk exhaled by the face-glands, which gives an unpleasant taste to the flesh of the bucks. These antelopes appear to be independent of water, and dwell in low bushes, upon the leaves of which they feed. They are best killed with shot, like rabbits, as they bolt from covert.

LIVINGSTONE'S SUNI

(*Neotragus livingstonianus*)

Lumswi, SHUPANGA ; *Inhlengana*, AMATONGA

From Mozambique southwards to Zululand the place of the true suni is taken by a slightly larger species, characterised by the thicker and longer horns of the bucks (maximum length 5 inches), the more rufous colour of the upper-parts, and the blackish upper surface of the tail. The general colour above is light rufous fawn, darker than elsewhere on the crown of the head, nape, and back, and gradually paling towards the white of the chin, throat, chest, under-parts, and inner surfaces of the limbs. The shoulder-height varies from about 14 to 15 inches. The delicately formed ears are large ; and the hair on the crown of the head is lengthened, although not forming an actual crest as in the duikers.

In Zululand the species is represented by a distinct race (*Neotragus livingstonianus zuluensis*), named by Mr. O. Thomas in the *Annals and Magazine of Natural History* for October 1898. The general colour of the upper-parts in this race is grizzled fawn instead of deep rufous or bay ; while the fetlocks are only indistinctly blackish in place of wholly black all round. Possibly the horns of the bucks run rather larger than in the typical Zambesi race.

These sunis, according to Mr. Vaughan Kirby, are essentially forest-antelopes, which never leave the thick covert except to feed in the open glades at early morning and again in the evening, and are independent of water. Although as many as a dozen may sometimes be seen feeding in company, they go about in pairs or are solitary.

" These antelopes," continues the same observer, " are equally bush

and grass feeders, and when pasturing in the open glades may constantly be seen raising their heads and clipping the leaves from various shrubs. Owing to the feeling of security which these silent forest-tracts afford, the lumswi may be seen feeding as late as 9 A.M., and in the afternoons as early as 4 P.M. In cloudy, wet, and cool weather they move about restlessly all day, frequently rising up and lying down again after feeding for half-an-hour. During the heat of the day they lie asleep under any shady bush, or even in open ground under the shade of the larger trees; but so perfect is their protective colouring, so exactly does it harmonise with the red-brown leaves which strew the ground underfoot, that though I have tried over and over again, sweeping the ground ahead with my field-glasses, I have never been able to detect one lying down. They usually lie very close, jumping up at from 10 to 30 yards, when they bound away with wonderful speed, twisting and dodging amongst the trees, and, being so small, are almost impossible to hit with a rifle. When alarmed during the heat of the day, however, they invariably stand after running about 100 yards, and if the eye has been quick enough to follow them, offer an easy shot; but if again disturbed, they run much farther before standing. When frightened on their feeding-grounds, they scurry off at a great rate and never stand so long as they think themselves in sight. They have three distinct cries, one of which is a sharp, clear, barking note, not unlike that of a bushbuck, but less intense, and invariably uttered when they scent or hear anything suspicious at a distance. When put up at close quarters, they utter a sharp whistling snort, and at pairing-time the bucks, when chasing the does, utter a low bubbling sound like a goat. The young are born between the middle of November and the middle of December, and are darker than the adults, being deep reddish yellow above, and pale cream, with a faint rufous tint, on the under-parts and insides of the limbs.

FIG. 41.—Skull and Horns of Livingstone's Suni.

"Extreme watchfulness and caution are necessary in order to bring these antelopes to bag; and the sportsman must be on the feeding-grounds at least an hour before sunrise, when he can devote his

attention to the small clearings and narrow open glades, carefully examining each 50 yards of ground in front as he advances up-wind. If numerous spoors and droppings indicate that any particular spot is a favourite resort of the game, it is best to take up a position and watch patiently; but as soon as the sun casts shafts of light among the trees, the sportsman must leave the open ground and, entering the forest, endeavour to stalk with care. In the pairing-season the bucks may be heard in all directions, and are then easy to approach. Less caution is necessary towards noon, when the antelopes are lying down. All likely spots—those well shaded and with a sprinkling of under-bush—must be tried, and when the game springs up the sportsman should kneel down and watch its flight till it stands, when an easy shot will be obtained."

This species exhales the same musky odour as the last.

SALT'S DIK-DIK

(*Madoqua saltiana*)

Dik-dik, KASSALA; *Beni Israel*, ARABIC; *Inshu*, ABYSSINIAN

(PLATE vi, fig. 14)

The curious little antelopes collectively known, from the local name of their typical representative, as dik-diks, constitute a very well-defined generic group of the *Neotraginæ*, distinguished from all the other members of that subfamily by the more or less marked elongation of the muzzle, which is almost entirely covered with hair, and the presence of a tuft of long hair on the crown of the head. The tail is so short as to be almost rudimentary, and the lateral hoofs are minute. The horns, which vary from half to three-quarters the length of the skull, are straight or slightly curved, with strong basal ribs. Like those of other mammals with trunk-like muzzles, the skull is remarkable for the shortness of the nose-bones and the large size of the nasal chamber; and it has large but shallow gland-pits, and also unossified spaces. In some species the last tooth in the lower jaw is peculiar in having only two lobes in place of the normal three. None of the species are larger than a hare, and all are of delicate and slender build.

They naturally fall into two subgeneric groups, as follows:—

1. *Madoqua*.—Two lobes to the last lower tooth; trunk slightly

developed; grey of neck sharply defined from rufous of nape; nostrils normal. Type, Salt's dik-dik.

2. *Rhynchotragus.*—Three lobes to last lower tooth; trunk well developed; grey of neck connected with rufous of head by a third colour; nostrils circular. Type, Kirk's dik-dik.

The beni Israel, or Salt's dik-dik, the typical representative of the whole group, takes its English name from Henry Salt, the Abyssinian traveller, by whom it was discovered in the early part of the nineteenth century. A native of the Coast Range of Eastern Abyssinia, it stands from 14 to 15 inches at the shoulder, and, in addition to the group-features already mentioned, is characterised by the general yellowish or fulvous grey of the back, which becomes scarcely more rufous on the flanks; the neck being greyish, the face and limbs faintly rufous, and the under-parts whitish. The maximum horn-length is $3\frac{1}{2}$ inches.

According to Dr. W. T. Blanford (*Geology and Zoology of Abyssinia*), this dik-dik is seldom found at elevations over 6000 feet. "It inhabits bushes, keeping much to heavy jungle on the banks of water-courses, and is usually single, or in pairs, either a male and female or a female and young being found together; less often the female is accompanied by two younger ones, which remain with her until full grown. . . . It rarely leaves the shelter of the bushes during the day, and is, I suspect, somewhat nocturnal in its habits, as I have seen it feeding on leaves at the edges of the jungle in the dusk of evening."

PHILLIPS'S DIK-DIK

(*Madoqua phillipsi*)

Sakaro Gol Ass, SOMALI

This species, which was named after Mr. E. Lort Phillips by Mr. O. Thomas in the Zoological Society's *Proceedings* for 1894 (p. 327), is somewhat smaller than the beni Israel, and has the back rufous, finely grizzled with ashy grey, and the sides, shoulders, and limbs bright rufous, as compared with the faint rufous of the shoulders and limbs in *Madoqua saltiana.*

This is the common dik-dik of northern Somaliland, where it

represents the Abyssinian species. It is extremely common on the plains at Berbera, where it may be put up in numbers, just as are hares in Europe.

Both this and the next two species might well be regarded in the light of local races of *M. saltiana.*

THE HARAR DIK-DIK

(*Madoqua hararensis*)

The dik-dik inhabiting the Harar district of South Somaliland as far as the Webbe Shebeyli has been separated from the last by Mr. Oscar Neumann on p. 87 of the *Sitzungs-Berichte Ges. Naturfor. Berlin* for 1905 under the above name. Having the flanks of the same uniform rufous as in *phillipsi*, it is distinguished by the hairs of the back lacking the ashy grey and dark brown grizzling of the latter, and having merely their tips ringed with isabelline rufous and dark brown, so that the whole tone of the back is rufous fawn.

ERLANGER'S DIK-DIK

(*Madoqua erlangeri*)

In this species, or race, which inhabits eastern Arussiland between the upper Webbe Shebeyli and the Webbe Ganale, the back has the same rufous tint as in *hararensis*, but the hairs of the flanks, in place of being uniformly coloured, have light tips or light reddish and dark rings, so that, unlike *hararensis* and *phillipsi*, the sides of the body are rufous grey instead of rufous. The whole animal resembles a red *swaynei*; the limbs are darker than in *phillipsi* or *hararensis*, and the size seems smaller than in any of the three species named. This dik-dik was named by Mr. Neumann at the same time as the last.

SWAYNE'S DIK-DIK

(*Madoqua swaynei*)

Sokaro Guyu, SOMALI

As this dik-dik, which was described by Mr. Thomas at the same time as *Madoqua phillipsi*, inhabits the same districts as the latter,

it has full claim to specific distinction. In colour it approximates to *saltiana*, but in size it is inferior to *phillipsi*, and therefore still smaller than *saltiana*. The back is grey with a strong suffusion of yellow or fulvous; the limbs are rufous, and the flanks faintly rufous, so as to differ markedly from the full well-defined rufous of the sides of the body in *phillipsi*. The bucks weigh but 6 lb. and the does even less.

This dik-dik, which takes its name from Colonel H. G. C. Swayne, is, like its kindred, extremely fleet, although the Somalis are able to run down very young fawns. It feeds on the young shoots of mimosa, and is partial to the neighbourhood of water, drinking, it is said, at mid-day and again at evening. These dik-diks lie very close, and when put up dash off with two or three whistling notes, which are only too apt to alarm the larger game in their immediate neighbourhood.

Colonel Swayne states that the gol ass (*i.e.* "red belly") is the ordinary dik-dik found all over Guban and Ogo and in parts of the Haud and Ogaden. The guyu differs in being very much smaller, with the flanks yellowish grey instead of reddish yellow. Both occur in the same districts.

THE DAMARA DIK-DIK

(*Madoqua* [*Rhynchotragus*] *damarensis*)

With this species we come to the second group of the genus, separated in 1905 by Mr. Oscar Neumann in the paper cited above generically as *Rhynchotragus*. The most important features of the group are the greater development of the trunk, as compared with the typical group, and the presence of the normal three lobes in the last lower molar teeth; other characters being mentioned under the heading of Salt's dik-dik.

Agreeing with the next species in the circumstance that the tip of the nose-bones of the skull is approximately on the line of the front border of the foremost pair of cheek-teeth, this dik-dik, which was described by Dr. A. Günther in the Zoological Society's *Proceedings* for 1880, is distinguished by its superior size, in which respect it appears, indeed, to exceed all other members of the genus except *Madoqua cavendishi*. A native of Damaraland, it doubtless has the habits common to dik-diks generally.

The range of the species is definitely known to extend from Omaruru, about 60 miles north of Walfisch Bay, to Benguela.

KIRK'S DIK-DIK

(*Madoqua* [*Rhynchotragus*] *kirki*)

Paa, SWAHILI

(PLATE vi, fig. 15)

Discovered by Sir John Kirk in southern Somaliland, and named by Dr. Günther in 1880, this dik-dik is distinguished from the last by a marked inferiority in point of size.

Typically this species, as already mentioned, is a native of the southern districts of Somaliland, but it also extends southwards into British East Africa, where it is represented by a somewhat larger race, *Madoqua kirki hindei*, first obtained by Dr. G. L. Hinde at Kitui, about 3500 feet above sea-level. It was described by Mr. O. Thomas in the *Annals and Magazine of Natural History* for 1902 (ser. 7, vol. x. p. 244). Compared with the typical Somali race, it is more tawny, or fulvous, in colour, the back being bright grizzled fulvous, in place of dull yellowish grey. The sides are also a brighter and clearer fulvous than in *kirki typica*; while even the sides of the under-parts are tinged with the same hue, and the legs are deep reddish fulvous. The white streaks above the eyes are conspicuous, the long hairs of the crest are deep reddish fulvous with black tips, and the upper half of the front margin of the ear is edged with black.

The range of this race extends as far south as Kilimanjaro.

THOMAS'S DIK-DIK

(*Madoqua* [*Rhynchotragus*] *thomasi*)

To the representative of the British East African race of Kirk's dik-dik inhabiting the Uniamwesi district, to the south of the Victoria Nyanza, and Masailand, Mr. O. Neumann (*Sitzungs-Berichte Ges. Naturfor. Berlin*, 1905, p. 89) has given the above specific name. It is, however, probable that the animal might be better regarded as a third race of *kirki*.

It is distinguished from *kirki hindei* by the more uniformly rufous tawny of the whole upper-parts; in the former only the middle line of the back being dark rufous tawny, while the sides are olive, or

fulvous.[1] The hairs of the back are ringed near the tips with red and black; but on the sides the black disappears, and the hairs on the shoulders and flanks are wholly rufous. The head is also uniformly rufous, although black-tipped hairs make their appearance on the occiput.

CAVENDISH'S DIK-DIK

(*Madoqua* [*Rhynchotragus*] *cavendishi*)

This species was described by Mr. O. Thomas in p. 278 of the Zoological Society's *Proceedings* for 1898 on the evidence of the skull of an immature male brought by Mr. H. S. H. Cavendish from, it is believed, the neighbourhood of Lake Rudolf. In general characters this skull comes very close to that of *Madoqua kirki*, but indicates a considerably larger animal—as large as, if not larger than, *damarensis*. A skin believed to belong to the same individual is dark fawn in colour—much darker than *damarensis*—on the fore part of the back, while posteriorly, by the disappearance of the tawny tinge, it becomes more greyish, till on the sides of the rump it is quite ashy grey. The shoulders, an ill-defined line along each flank, and the fronts of the limbs are sandy; while a tinge of dull fulvous suffuses the hairs of the crest.

Its wide geographical separation renders it improbable that the Lake Rudolf dik-dik is identical with the Damara species.

GÜNTHER'S DIK-DIK

(*Madoqua* [*Rhynchotragus*] *guentheri*)

Sokaro Gussuli, SOMALI

With Günther's dik-dik, of Central Somaliland, we come once more to a thoroughly well-marked species, distinguished, among other features, by the excessive development of the trunk. It was first described by Mr. Thomas on p. 324 of the *Proceedings* of the Zoological Society for 1894.

Having the essential characters of *kirki*, this species is distinguished by the greater length of the upper jaw of the skull, accompanied by a corresponding shortness of the nose-bones, the tips of which are in

[1] The colours are named somewhat differently by Mr. Neumann as compared with Mr. Thomas.

a line with the front border of the third pair of cheek-teeth. The teeth are also relatively smaller, and especially the third lobe of the last molar. Externally the only noticeable distinction from *kirki* appears to be the much greater elongation of the muzzle, which is thus decidedly more trunk-like, and gives to the creature a bizarre appearance to which frequent allusion has been made by Somali sportsmen.

On the evidence of a skull and scalp from the Lake Stephanie district Mr. Thomas (*Proc. Zool. Soc.* 1900, p. 804) has named a local race of this species *Madoqua guentheri smithi*, characterised by its superior size. It probably bears much the same relation to *guentheri* as does *cavendishi* to *kirki*, although, on account of the probable existence of intermediate forms, it has been described as a race rather than a species.

THE WHITE-SPOTTED DIK-DIK

(*Madoqua* [*Rhynchotragus*] *nasoguttata*)

A duiker from the neighbourhood of Lake Baringo, British East Africa, was described in 1907 by Professor E. Lönnberg (*Arkiv Zool. Stockholm*, vol. iv. no. 3, p. 1) under the above name. In general skull-characters it resembles *guentheri*, but the nose-bones are shorter. The general colour is grizzled grey, becoming somewhat sandy on the back, and still more yellow on the flanks; the under-parts being white. The muzzle is pale rufous, passing into bright rufous on the forehead, which forms a band over each eye. The most characteristic feature—if constant—is, however, the presence of a large number of white spots on the anterior rufous portion of the face and the trunk-like muzzle.

THE WATERBUCK

(*Cobus ellipsiprymnus*)

Kring-gaat, CAPE DUTCH; *Chuzu*, ALONGA, CHILALA, AND CHIZENGA; *Sidumuga* OR *Li Tumogha*, MATABILI; *M'dongoma* OR *Matutwi*, BAROTSI; *Kuru*, SWAHILI; *Tumoga*, BECHUANA; *Na' Tora*, M'KUA; *Etumuha*, MAKALAKA; *Mukulo*, BATONGA; *Nyakodzwe*, NYASA.

(PLATE vii, fig. 1)

Leaving the tiny and, from a sporting point of view, somewhat uninteresting dik-diks, we pass to some of the largest and gamest of

all African antelopes, in the shape of the well-known waterbuck and its immediate relatives, all of which are generally included in the genus *Cobus*. The members of this genus, together with the vaal rhebok, belong to a subfamily of large or medium-sized African antelopes typified by the reedbucks (*Cervicapra*), and hence known as the *Cervicaprinæ*. All have the muzzle naked, the face-glands rudimentary or wanting, the tail of moderate length, the lateral hoofs well developed, and the horns confined to the male sex. The upper cheek-teeth are of a narrow, sheep-like type, and the second pair of lower incisors has expanded crowns. Pits for the reception of face-glands are wanting in the skull. In form the long or medium-sized horns of the bucks are never twisted, but are generally curved backwards at the bases, where they are strongly ridged, after which they curve upwards and forwards to the smooth tips; they may, however, have a sinuous flexure or be perfectly straight.

The waterbucks and kobs, which include the largest species, may be distinguished from the other members of the subfamily by their long and somewhat lyrate horns, the straight and frequently coarse fur, the absence of a bare patch below the ears, the rudimentary face-glands, the long and slightly tufted tail, and the full development of the lateral hoofs. In the skull the bones forming the extremity of the upper jaw (premaxillæ) extend upwards and backwards to join the nose-bones (nasals), and there are deep pits in the forehead. In the case of the waterbucks, at any rate, the females have four teats.

The waterbucks, which are large species, with the hair grizzled and the neck maned, form the typical group of the genus.

The kobs, on the other hand, which are smaller, with the hair, at least in females and immature bucks, rufous, and the neck devoid of a mane, constitute the subgenus *Adenota*.

The waterbuck, which stands from 43 to 48 inches at the shoulder and may weigh as much as 360 lb. clean, is sufficiently characterised by the large white elliptical ring on the rump from which it takes its specific title. The general colour is a grizzled grey roan, but the face is browner and the forehead rufous, while there is a white streak in front of each eye, as well as a white area round the muzzle and on the lower lip, and a large white patch on the throat. The inner side of the large and rounded ears is also white, but the outer surfaces of these appendages are brown, as are likewise the legs, although their shade is darker. Brown is also the colour of the tail, which terminates in a medium-sized tuft barely reaching the hocks. Everywhere the coarse hair is long and more or less shaggy, but it is especially so on

the neck, where its direction is reversed so that the mane forms a kind of ruff. The record length attained by the graceful horns, which are ridged to within a short distance of their summits, is $36\frac{1}{4}$ inches, or just a yard—an easy figure to remember. In connection with this it should be mentioned that in old bucks the horns frequently become worn down—"stubbed"—by rough usage.

The range of this handsome antelope—whose partiality for the neighbourhood of water is sufficiently indicated by its name—commences on the east coast immediately north of the Limpopo river, whence it extends to the Webbe Shebeyli in southern Somaliland. Zululand, the Transvaal, Mashonaland, Nyasaland, and German and British East Africa thus come within the limits. Nowadays the species, which never seems to have been very common, has, however, a much more curtailed range; its main strongholds being the unhealthy districts between the Sabi and Zambesi rivers, the tributaries of the latter, and the Chobi, Okavango, and other rivers above Lake Ngami.

The head of a waterbuck believed to come from the Masai tableland has been made the type of a separate species by Dr. P. Matschie (*Weidwerk in Wort und Bild*, 1906, p. 234), under the name of *Cobus adolfi-frederici*, on account of the dark colour of the nose, and the absence of a white throat, as well as by the relatively short smooth tips of the horns. If these features prove to be constant, the Masai waterbuck may be regarded as a local race—*C. ellipsiprymnus adolfi-frederici*.

Waterbuck associate, as a rule, in parties of from about half-a-dozen to a score; and although, as already mentioned, partial to the immediate neighbourhood of water, they may resort to stony hills or thick covert a mile or so away from the nearest river or lake. When pursued, they generally make for their favourite element, although this is by no means invariably the case. Despite their heavy build and short legs, they are remarkably active animals, ascending stony slopes with surprising agility, and displaying a great turn of speed when galloping on the flat. Occasionally they are found near salt-water creeks on the coast. When hard pressed, they will not unfrequently betake themselves to the dense reed-brakes bordering many of the African rivers, or even to the water itself; and when brought to bay in these or other situations the old bucks should be approached with caution, as they make terrific sweeps and lunges with their spear-like horns. Waterbuck are likewise good swimmers, although a well-merited dread of crocodiles makes them cautious about crossing deep rivers.

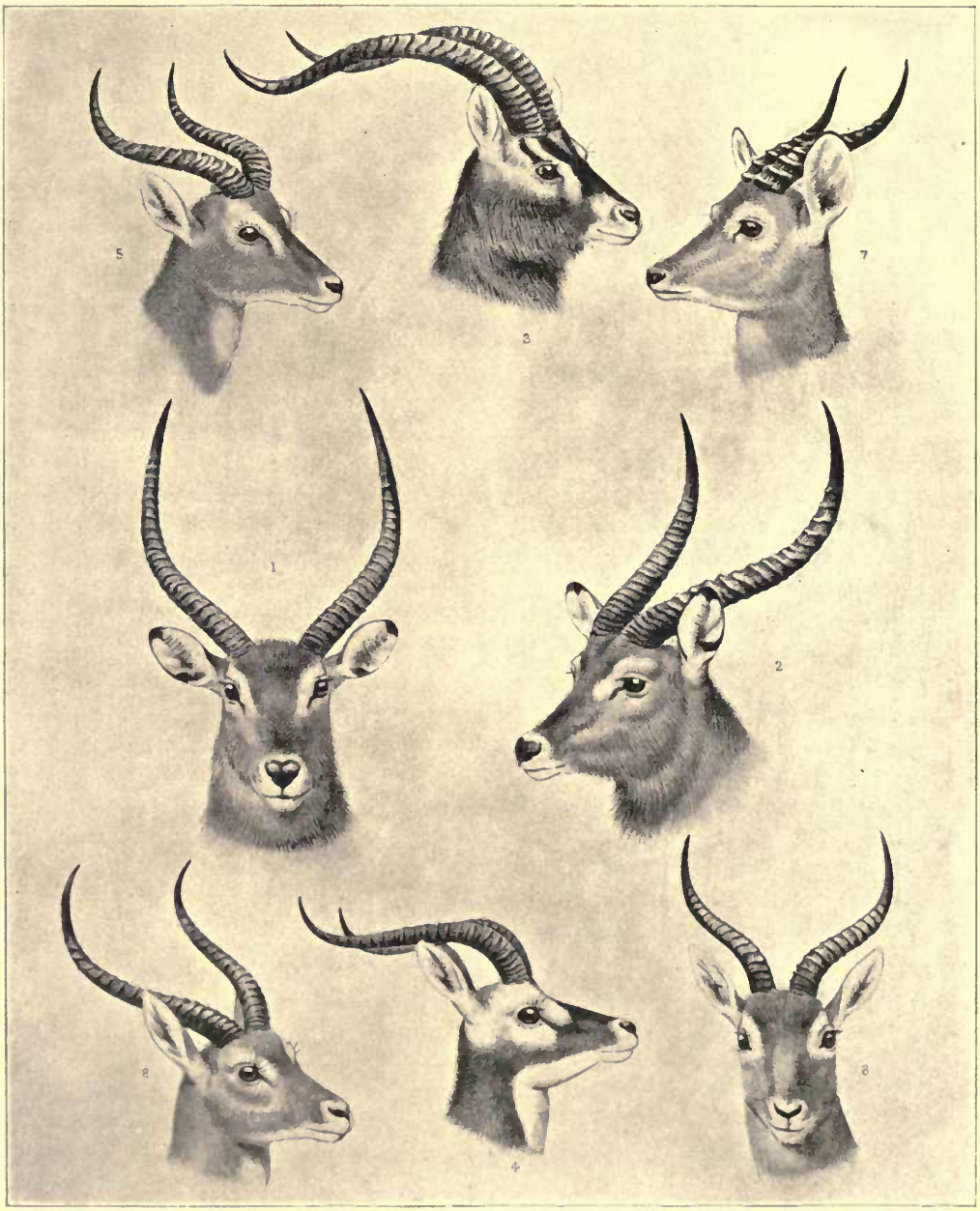


PLATE VII

1. Waterbuck.
2. Sing-Sing.
3. Mrs. Gray's Kob.
4. White-eared Kob.
5. Uganda Kob.
6. Buffon's Kob.
7. Puku.
8. Lechwi or Leche.

Although these antelopes feed almost entirely on grass, their flesh has the reputation of being about the worst in the whole tribe. Like many other African species, they are hard to kill. Each party is usually accompanied by one old buck; but solitary bucks are also encountered. The following account of waterbuck-shooting in 1846 is from the pen of Gordon Cumming:—

"On the 18th I rode up the banks of the river with my dogs to seek for waterbuck, and arriving where another considerable river's bed joins the Ngotwani [a tributary of the Limpopo in Bechuanaland], I came upon one, the first I had ever seen. He was standing among some young thorn-trees, within sixty yards, and had his eye full upon me. Before I could pull up my horse he was off at a rapid pace, and crossed the river's bed above me; I shouted to the dogs and fired a shot to encourage them, but in half a minute the buck disappeared over a rocky ridge, with three or four of my best hounds within thirty yards of his stern. I knew that he would make for the nearest water, and accordingly kept my eye down the river, listening with an attentive ear for the baying of the dogs. Presently the noble buck appeared ascending a rocky pyramidal hill down the river-side with the agility of a chamois, and only one dog, Boxer, my best, at his heels. I galloped down at top speed to meet him, but was too late; however, I fired a long shot to encourage the dog, and next moment, in ascending the opposite bank, my horse fell and rolled down it very nearly on the top of me; on regaining his legs Jock declined being caught, and made off for camp, followed by my after-rider. Alert at this moment came up, having eight or ten inches of the skin of his breast and forearm ripped clean up by the waterbuck. I now fancied that I had lost the quarry, but a little after I heard Boxer's voice as he came down the river-side with the buck, having once more turned him. I ran up the bank at my best pace to meet them, and found the buck at bay in a deep pool, surrounded by high banks of granite rock; he would not, however, stand, but swam through the deep water and broke bay on the opposite side. Boxer held on, and following him up the river, once more turned him to this pool; I met them coming down the water-course, and sent a ball into the buck's throat, which made blood flow freely from his mouth; but he held stoutly on and plunged into the deep pool, standing at bay under a granite rock. I then headed him, and from above put a bullet between the shoulder-blades, which dropped him dead on the spot. He died as a waterbuck ought, in the deep water. My success with this noble and very beautiful antelope gave me most sincere pleasure."

Sir Alfred Sharpe, writing of these antelopes in Nyasaland, states that when entering the district by way of the Shiré, large herds of waterbuck are seen near the banks of the river in what is known as the "elephant-marsh," a large plain lying above the junction of the Ruo with the Shiré, and up to 1889 frequented by many elephants. It is now a strictly guarded game-preserve, where numbers of waterbuck, zebra, and buffalo roam unmolested. Waterbuck were, at the time of writing, abundant throughout the Zambesi and Shiré valleys, as well as on the shores of Lake Nyasa. They are less shy and wary than most other Nyasa antelopes, and not difficult of approach; and may frequently be seen close up to the outskirts of native villages, especially in the early morning.

South of the Zambesi the calves are usually born during September, October, and November.

An albino waterbuck is recorded in the Zoological Society's *Proceedings* for 1905 (vol. ii. p. 296), and in the same journal for the preceding year (vol. i. p. 3) reference is made to a hybrid between this species and the next.

THE DEFASSA OR SING-SING WATERBUCK

(*Cobus defassa*)

Defassa, ABYSSINIAN; *Gŭrŭmes*, GALLA; *Nsama*, WAGANDA; *Kib buligoren*, MASAI; *Kipkonorian det*, WANDEROBBO; *Kuru*, SWAHILI; *Tambur*, DINKA; *Katambou*, SUDANI; *Sing-sing*, GAMBIA; *Dodoka* AND *Gumbasa*, HAUSA; *Doko*, YURUBA; *Idcitwe*, BAROTSI; *Ingonduma*, MATOKO; *Chuzwi*, BRITISH CENTRAL AFRICA.

(PLATE vii, fig. 2)

In the case of this species, as in that of the korrigum hartebeest, we have two native names—defassa and sing-sing—commonly employed in this country to denote local races of what is essentially one and the same animal.

From the typical waterbuck the defassa (which name may be conveniently used for the species as a whole) is broadly distinguished by the replacement of the white ring on the buttocks by a large continuous white patch. In size the defassa is approximately the same as its relative, the ordinary shoulder-height being apparently about 48 inches.

In its typical rufous phase it is, however, a decidedly handsomer animal, the contrast between the general foxy-red tint of the long shaggy coat and the white eye-stripes and black legs being very striking. The horns are so like those of the typical waterbuck as apparently to be indistinguishable.

As the features already mentioned are amply sufficient for its recognition, it will be unnecessary to describe the species in detail; and attention may accordingly be concentrated on its local races, which are in the main nothing more than colour-phases. Unknown to the south of the Zambesi, the species ranges north of that river into Somaliland and Abyssinia, while on the west side of the continent its distributional area includes Angola and Gambia.

The Abyssinian, or typical, defassa (*Cobus defassa typicus*) has a bright rufous or foxy-red coat, with a relatively large amount of white in front of the eyes, and the ears longer and more pointed than in the other races; the forehead being bright rufous, and the throat showing a broad white gorget. The typical defassa was named by Rüppell in 1835 on the evidence of specimens from the neighbourhood of Lake Tana and the upper Blue Nile, in West Central Abyssinia; whence it has been generally supposed to range into Kordofan, Sennar, and thence southwards into Uganda and the Tanganyika district. Mr. Oscar Neumann (*Sitzungs-Berichte Ges. Naturfor. Berlin*, 1905, p. 92) is, however, of opinion that three other forms of defassa are to be found in this area. As these differences from the typical animal are apparently but slight, they should perhaps be regarded as subraces rather than races, and therefore not worthy of separate names.

The first of these is the defassa of the White Nile, *C. d. harnieri*, named by Murray, of which the distinctive characters are not mentioned by Mr. Neumann.

The second, *C. d. matschiei*, from the Lake Abaya district, and thence probably southwards to Lake Rudolf, is stated to be rufous on the back and iron-grey on the loins and sides, and to differ from *harnieri* by the larger white eye-streak and the greater extent of white on the chin.

The Uganda defassa (*C. d. ugandæ*), from the neighbourhood of Lakes Victoria, Albert, and Tanganyika, is characterised by its large size, and by the general colour being paler than in *harnieri*, although the forehead is a brighter rufous, forming a more decided contrast with the general tone of colour than in either of the two preceding. The "record" horns belong to this form, the three longest specimens mentioned in *Records of Big Game* being one from near Toru measuring

35¼ inches, and two from Uganda, measuring respectively 34 and 32½ inches.

The Mweru race (*C. d. crawshayi*), from the Lake Mweru district and other parts of British Central Africa, described by Dr. P. L. Sclater on p. 726 of the Zoological Society's *Proceedings* for 1893, appears to be more distinct than the three preceding forms. The colour of the back is, for instance, described as being dark iron-grey, approximating to that of the true waterbuck, but darker, and passing into blackish on the back of the neck, upper part of the legs, and tail; while on the flanks it becomes lighter and greyer, gradually

FIG. 42.—Sing-Sing at Woburn Abbey, from a photograph by the Duchess of Bedford.

passing into whitish on the under-parts. All the known horns of this race are relatively small as compared with the Uganda race, the maximum recorded length being 29 inches.

With the Gambian race, or sing-sing (*C. d. singsing*), we again come to a rufous type near akin to the typical Abyssinian race, but with a smaller amount of white in the neighbourhood of the eye. The range of this race includes Sierra Leone and a large part of Nigeria.

Most distinct of all is the Angola race (*C. d. penricei*), described by the Hon. Walter Rothschild in *Novitates Zoologicæ* for 1895 (vol. ii. p. 52) on the evidence of specimens obtained by Mr. G. W. Penrice about one hundred miles south-west of Benguela. In the original

description this race (there regarded as a species) is stated to be distinguishable from its allies by its intensely blackish colour. The muzzle is whitish; the face black, with a few rufous hairs between the horns; and the ears are externally rufous brown with blackish tips and edges, and internally white. The sides of the face, the neck, and body are deep brownish black, with a mixture of reddish-brown hairs, thus producing the tint known in horses as blue-roan, this being most conspicuous on the under-parts. The tail is black above and white below. There is a large patch of white on the lower part of the throat, but none on the rump. The horns are relatively stout and short, 29 inches being the present record.

Finally, the defassa of the Laikipia district of British East Africa has been distinguished by Professor E. Lönnberg (*Arkiv Zool. Stockholm*, vol. iv. no. 3, p. 7, 1907) as *C. d. tjæderi*, on account of the large size of the black area on the face, which extends from just above the white ring on the muzzle to above the middle of the white eye-streak, the forehead above this being rufous. The dark areas elsewhere are also more extensive than in the typical race, while the general tone of colouring is everywhere darker.

The following account of the Uganda (British East African) defassa is abbreviated from one written by Mr. F. J. Jackson:—

"Excepting in places thickly inhabited, such as Kavirondo and Usoga, these antelopes are more or less abundant throughout the Uganda Protectorate wherever there is a sufficiency of water. They go about in herds of from four or five (one of which is nearly always a bull) up to twenty or thirty. In these larger herds there are generally five or six young bulls, which are evidently driven off by the older and stronger ones during the rutting-season, as I have often seen a herd of as many as fifteen young bulls together. In their turn the younger bulls drive out the old ones, which are frequently met with entirely by themselves. Defassa are larger and heavier than the *C. ellipsiprymnus* found in East Africa; and although they vary a good deal in colour according to age, they are also on the whole much darker and have a good deal of rufous hair on the upper part of the face and back of the head. Their coat is very rough and coarse, and also very greasy. The hair on the neck of the cow is longer than that of the bull, and stands up close to the head, forming a small ruff round the throat. In Toru and on the west side of Lake Albert the defassa are far finer than those from any other part, and Major Sitwell obtained one in 1897 with 35½-inch horns.

"Defassa, like all waterbucks, are never found far from water, and

very rarely far from bush or other covert, into which they can retire for safety, although occasionally they are seen in places where they are seldom disturbed a good way out in the open plains in the early morning. Compared with other antelopes they are tame beasts, and are not difficult to stalk even in places where other game is unapproachable. On one occasion, at the south end of Lake Nakuru, where they are very numerous, and where, from being constantly harassed by the Wanderobbo, the hartebeest and Grant's gazelles were so wild that they went clean away when I was half a mile off, two parties of defassa, standing and lying down under the shade of large isolated trees, allowed me and my gun-bearers to walk past within 120 yards, and even when the caravan came up only moved about 50 yards farther. On another occasion, at Baringo, I walked past a small herd within 80 yards, and beyond standing and gazing in their inquisitive-looking way, they took no notice.

"The cows drop their young from about the middle of December to the end of February. The calves are hardy little animals, and very soon become remarkably tame in captivity. One I had at the Ravine Station was eight months old when I left in August 1898, and was then little more than half-grown. It was quite tame and had the free run of the place, but never went far from the fort, and returned again regularly about four o'clock. The horns were just beginning to show when I left, although a young cow hartebeest, two months younger, had already developed horns over two inches long.

"The measurements and weights of a bull and cow taken on the spot, not gralloched, are as follows:—Bull, total length, 8 feet 1½ inches; height at shoulder, 4 feet 3 inches; tail, 1 foot 3½ inches; weight, 487 lb. Cow, total length, 7 feet 8 inches; height at shoulder, 3 feet 8½ inches; tail, 1 foot 1½ inches; weight, 395 lb."

Writing of the Gambian or West African race, or sing-sing, Major A. J. Arnold observes that—

"It must be on the *lucus a non lucendo* principle that it is known as a waterbuck, for it is found only in hilly and, as a rule, stony country. The upper slopes or flat crests of stony ridges are quite the most likely ground whereon to find it, though there it must rather be looked for in the precipitous gullies and nullas which cut up the surface. When met with on the lower slopes, it will invariably head up-hill, and dash across the roughest boulders with amazing fearlessness and sureness of foot. The only time I have heard of these antelopes by water in numbers was up the river Benue, towards Yola, when an officer of the Royal Niger Constabulary steaming up-stream saw a

herd of a dozen swimming across the river, which at that place was about three-quarters of a mile in width. He and his companion got into a boat with some natives and paddled after the herd, with which they came up easily enough, and even succeeded in getting hold of the horns of a couple of bulls. The strength of the antelopes was, however, prodigious, and there was no holding them when they gained foot-hold at the bank; so that the herd got clean away in spite of a couple of hasty shots at a range of 10 yards as they topped the bank above the boat. As a rule, sing-sing go about in families, though occasionally, as in the above case, two or three families may be seen together. The calves, which are dropped about Christmas, appear to remain with their parents for a much longer period than do the young of other antelope on the west coast, in fact almost until they arrive at maturity. With calves about, the female is very wary and suspicious, and ever on the watch; taking her food a mouthful at a time, and then standing watching carefully in every direction, or patrolling in a circle around the corner in which her young are feeding and gambolling. Sing-sing being comparatively slow movers, it is possible that the young are the special prey of lions and hyænas; and hence that the increased wariness of the female is due to the knowledge that they stand less chance of saving themselves by speed.

"But at the best of times sing-sing are very shy and suspicious, and when alarmed rarely give way to that curiosity which so often proves fatal to other antelopes. Only once have I known a bull stop to ascertain the cause of an alarm; and from the way in which he stood broadside-on, gazing intently in a direction at right angles to that from which I was approaching, it seemed that, while quick in hearing, they possess even less power than most antelopes of locating the direction of sounds.

"To stalk a party of sing-sing, even with all the advantages which the ground they frequent gives, is a difficult business, as they are so keenly watchful of everything. I have seen them start away for apparently no reason whatever, although it is always a question whether the wind in those rocky hills and gullies does not at times play absurd pranks, and give notice of the observer's presence, even when he is directly down-wind from the animals.

"On the other hand, it is much more probable that the sportsman will come up with them if he follows on the fresh tracks of a party of sing-sing, than is the case with hartebeest, roan antelope, or kob. They do not wander much when feeding, their chief object being apparently to make certain of their feeding-ground as a safe place,

where they can remain for the morning or even the whole day. Fresh tracks must be followed carefully and cautiously; and very silently must the hunter move, or he may easily give himself away, and never see the beasts he is tracking. Sing-sing are, indeed, difficult to discern, even when full in view; and until well used to the bush and the game, it may easily happen that the hunter may be well within sight and shot and yet not see his quarry. The flesh of the sing-sing is coarse and unpalatable, being almost uneatable by Europeans, although natives will eat it without reluctance."

MRS. GRAY'S KOB

(*Cobus maria*)

Til, NUER

(PLATE vii, fig. 3)

Although commonly classed with the typical waterbucks, Mrs. Gray's kob (so named after the wife of Dr. J. E. Gray, sometime keeper of the zoological department of the British Museum) seems more nearly related to the next species, and thus renders inadvisable the generic separation of the kobs from the waterbucks. This strikingly handsome species is readily distinguished by the long, slender, doubly curved horns, ridged nearly to their tips, and the blackish-brown body-colour of the old bucks; this sable livery being relieved by a whitish patch in front of the withers, the yellowish-white ears, a yellowish streak behind, above, and in front of each eye, and the yellowish muzzle, chin, and patch on the lower part of the throat. The limbs and much of the under-parts are wholly dark in the adult bucks, which attain a shoulder-height of about 38 inches. Immature bucks and females at all ages are chestnut-red. The maximum known horn-length is $32\frac{1}{4}$ inches.

The haunts of this kob are the papyrus-swamps of the White Nile, Bahr-el-Ghazal, Sobat, and other rivers of the southern Sudan. These antelopes are found in large herds, although we have but few particulars of their mode of life, which is, however, doubtless similar to that of the white-eared kob. The gradual development of the dark livery of the old buck likewise, in all probability, takes place in the same manner in both species.

THE WHITE-EARED KOB

(*Cobus leucotis*)

Kala, NIAM-NIAM; *Til*, SHOALI AND DINKA; *Kul* AND *Wuil*, DJENG; *Hamaraia dyl*, SUDANI

(PLATE vii, fig. 4)

Of somewhat inferior dimensions and of lighter build than Mrs. Gray's kob, the old bucks of the present species have the same blackish brown livery and light-coloured ears and face-markings. The yellow patch in front of the withers of *Cobus maria* is, however, wanting, and the light areas on the head are more extensive and wholly white. The white of the ear is, for instance, continued forwards to the base of the horn from which it descends to form a large area round the eye, which is separated by only a comparatively narrow dark bridge from the white of the muzzle. The latter area, which is larger than in *maria*, is continued along the under surface of the lower jaw to form an extensive white patch on the upper part of the throat. The under-parts and portions of the inner and front surfaces of the limbs are likewise white. Another difference between the two species is that along the dorsal line the direction of the hair in the white-eared kob is reversed (that is to say, inclined forwards instead of backwards) from the loins in place of only from the middle of the back. Young males, like females of all ages, are of the usual chestnut or foxy red. The horns of the bucks are stouter and shorter, with a more simple lyrate curvature, than those of Mrs. Gray's kob, the record length of specimens definitely known to belong to this species being $23\frac{1}{4}$ inches. The shoulder-height is about 34 or 35 inches.

The range of the white-eared kob covers much the same area as that of *maria*, namely, the swamps of the White Nile, Sobat, Bahr-el-Ghazal, etc., but extends somewhat farther south, so as to embrace a portion of the Niam-Niam country.

From the examination of a large series of specimens, it seems that the young bucks, so far as the head and neck are concerned, are wholly chestnut-red, with the exception of two patches of white on the throat, which are so common among antelopes, and are evidently for the purpose of counteracting the effect of the dark shade thrown in strong sunlight on the under-parts. The first indication of the adult colouring is shown by the appearance of a small streak of black on

the cheek and another on the forehead. Gradually these black areas increase in size, while at the same time white begins to make its appearance on various parts of the face. Eventually the whole head becomes black and white, the white occupying the entire surface of the ears and a large portion of the forehead and cheeks.

The assumption of a sable livery by the adult males (and in some cases by both sexes) of several species of hollow-horned ruminants is well known, and is evidently a specialised feature. It does not, however, appear to be recognised that white may also be largely developed at the same time. In many instances, as in the case of the rump-patch of the bantin and the "stockings" of the gaur, the white is met with in the young of both sexes. The young bantin has, however, the outer side of the lower part of the legs chestnut, and it is not till the animal becomes adolescent that these turn white. Similarly the white rings round the eyes of adult male blackbuck are not developed till the assumption of the sable livery. The large white areas on the head of the white-eared kob seem, however, to be unparalleled as a secondary development, and are, therefore, of more than ordinary interest.

Modern researches have shown that the senile whitening of the human hair, and probably also the winter whitening of many Arctic animals, is due to the work of phagocytes. In the case of the present species it would seem, however, that the white hairs of the adult are a new development; and if so, we have the curious phenomenon of the cessation of development of pigment in areas where it was abundant in the young state of the animal. Such a cessation of the production of pigment is evidently a much more remarkable feature than the change of colour from chestnut to black, which is what ordinarily takes place.

White-eared kob are essentially water-loving antelopes, associating in large herds, which may sometimes include two or three hundred individuals. Like lechwi, these antelopes, when first starting to run, or even in the middle of a gallop, frequently leap high in the air several times in succession.

VAUGHAN'S KOB

(*Cobus vaughani*)

For some considerable time previous to 1906 rumours were prevalent among sportsmen as to the existence in the southern districts of

the Bahr-el-Ghazal province of an undescribed species of antelope near akin to the white-eared kob, but distinguished by the coat being foxy red at all ages instead of the coloured areas turning blackish brown in the old bucks. The good fortune of making this antelope known to the world fell to Captain P. E. Vaughan, of the Egyptian army, who in that year sent home the head-skin and horns of an adult buck, which are now mounted and exhibited in the British Museum. The animal was shot near Wau, long. 28° 10′ E., lat. 7° 30′ N., in the Bahr-el-Ghazal, and was the only buck in the herd, which included seven or eight does. Captain Vaughan has, however, also killed five or six other specimens of this antelope from the south-western district of the Bahr-el-Ghazal province. The specimen was described by the present writer as a new species in the *Field* for October 1906 (vol. cviii. p. 693).

In the general style of colouring this antelope, so far as the head and neck are concerned, comes very close to the white-eared kob; both sides of the ears, a large patch extending thence to surround each eye, the muzzle, chin, upper part of throat, and also the lower portion of the chest being white. Elsewhere the colour of the head and neck is bright foxy red, with a faint tendency to brown along the middle line of the nose. Unlike *leucotis*, the base of the back of the ears is coloured, and the white area between the ear and the eye is rather smaller than in the latter. The horns also seem to be somewhat shorter and less curved than in the dark species. As regards the rest of the colouring, it is stated by Captain Vaughan that there is a black line down the front of both legs, extending all the way in the front pair, but in the hind ones not reaching above the hocks. With the exception of the white under-parts, the rest of the coat is of the same foxy red as the head and neck. It is noticeable, however, that many of the old bucks show a certain number of blackish hairs on the neck and back, evidently foreshadowing the dark coat of the adult males of *leucotis*. Young bucks (and apparently does at all ages) are uniformly foxy all over.

According to its discoverer, the herds of this kob may include from one buck and seven or eight does to as many as seventy or eighty head, among which will be perhaps a dozen bucks of all ages. Captain Vaughan writes:—

"It appears to be the common kob of the Bahr-el-Ghazal province, by which I do not refer to the Bahr-el-Ghazal river, but to the district south of the Meshra-el-Rek and north of the Congo Free State, bounded on the east by the Nile and on the west by the French

Congo. I have not been in the eastern half of this district, but I infer that the white-eared kob is not found there. Personally I never saw in the western half of the province a herd or a single specimen of *leucotis*, whereas the fox-coloured kob abounds everywhere near the rivers. I was in this province from November to June, and during that time did not notice any change in the colour of the fox-coloured kob's coat. I saw a considerable number of *leucotis* (with the distinctive black-brown coloration) on the banks of the Bahr-el-Ghazal north of the Meshra, and on the White Nile on my way down to Khartum, and I should say the *leucotis* was found on both banks of the river from Renk (say, lat. 11° N.) down as far, perhaps, as Meshra (lat. 8.5° N.), but, unless possibly in rare instances, not south of Meshra. In the western half of the Bahr-el-Ghazal I never saw a sign of *leucotis*, and am convinced it does not occur there. Within a month I saw many herds of the fox-coloured kob south of Meshra, and *leucotis* in the north, and I can positively state that the former is not *leucotis* in either its winter or summer coat."

From these notes there seems no doubt that Vaughan's kob is a perfectly distinct species (or race), tending in some degree to connect Buffon's kob with *leucotis*, although decidedly nearer to the latter than to the former. All three species agree in having the direction of the hair of the back reversed from the loins to the neck, and evidently form a closely allied group, of which *Cobus coba* is the West African representative. Of the three eastern forms, the Uganda red kob (*C. coba thomasi*) is clearly the least specialised ; then (in the intermediate area) comes *C. vaughani*, with its white ears and face-markings ; and then farther north *C. leucotis*, in which these markings are more pronounced, and a dark coat is developed in the old bucks. The gradation is of a most interesting nature.

I have taken into consideration whether it would be advisable to regard all these antelopes as local forms of a single species ; but have arrived at the conclusion that, for the present at any rate, it is preferable to allow them specific names.

Examples of all may be seen in the British Museum (Natural History), where, however, Vaughan's kob is now represented only by a head.

It may be added that *C. vaughani* has no trace of the white areas on the lower part of the legs which are to be seen in *leucotis*, while there is considerably more black on the hind-legs than in the Uganda red kob.

BUFFON'S KOB

(*Cobus coba*)

Maria, HAUSA; *Abedi*, IGARA; *N'Sunu* OR *Sunu*, WAGANDA

(PLATE vii, fig. 6)

The typical, or Buffon's, kob (sometimes known as *Cobus annulipes*) includes several races, generally regarded as distinct species, but in reality nothing more than local variants of one and the same animal. In common with the under-mentioned puku, it differs from the two preceding species in that the backs of the ears in both sexes are of the same rufous colour as the body; and is specially characterised by the horns being shorter and thicker than those of the aforesaid species, and by the black front surfaces to the limbs. The height at the shoulder ranges from about 32 to 35½ inches. The coat is short and close.

The typical, or Guinea race, which apparently ranges on one side to the Gambia and on the other to Nigeria and extends inland to the Lake Tchad district, is relatively small, standing from 32 to 33 inches, with the whole face rufous, a white line above each eye, and the black confined to the legs; the lips, chin, under-parts, and the inner surfaces of the fore-legs and thighs, as well as a ring above each hoof, being white (the latter feature giving rise to the name *annulipes*).

The Cameroons representative of the species (*C. coba pousarguesi*) has been separated by Mr. O. Neumann in the *Sitzungs-Berichte Ges. Naturfor. Berlin* for 1905, p. 91, on account of its superior stature, darker rufous colouring, and thicker and less gracefully curved horns, of which the smooth points are also shorter than in the Guinea race. The range extends from the Cameroons to the Congo.

In the Sudan race (*C. c. nigroscapulatus*), described by Dr. P. Matschie in the above-mentioned journal for 1899, p. 15, on the evidence of an old specimen in the zoological museum at Darmstadt from the Bahr-el-Ghazal province of the Sudan between 6° and 7° N. latitude, the nose has an oval black spot, a broad black band on the side of the neck borders the white of the chest, and the black on the fore-quarters extends from the hoofs, which are, however, surmounted by a white ring.

The eastern or Uganda race (*C. c. thomasi*), which was described by Mr. O. Neumann in the Zoological Society's *Proceedings* for 1896, p. 193, as *Adenota thomasi*, is considerably larger than the typical Guinea kob, standing as much as $35\frac{1}{2}$ inches at the shoulder. It is

FIG. 43.—Head of the White-eared Kob.

further distinguished by having a large white patch round each eye, and the absence (at least in the specimen exhibited in the British Museum) of the white fetlock-ring; while the black on the fore-limbs does not reach the shoulder, and that on the hind pair stops some distance short of the hocks. The horns are stated to be yellower in

colour, and larger in size, with blunter ridges, than those of the typical race.

The range of this race extends from Kavirondo to Uganda. These antelopes associate in herds of from 30 to 50, in which the females are about five to one as compared with the males.

The name *Cobus* (*Adenota*) *mengesi* has been proposed by Mr. O. Neumann, *Zool. Jahrbuch Systemat.*, vol. xiii. p. 560, 1900, for a supposed South Somali representative of the species, but further information is required before this name can be accepted.

The finest head of the typical race, in which the horns measure 21 inches, was obtained in Nigeria by Lady Constance Stewart Richardson in 1907. In the Uganda race the record horn-length is $24\frac{1}{2}$ inches.

Writing of the typical western race, Major A. J. Arnold observes that in the Benue valley it is common enough "for its skin to be an article of export, and many thousands are obtained yearly by the native Mitchi and shipped to Europe. The trade appears to have been going on for years without any diminution of the herds, which are very large and numerous. Herds of several thousands may be seen feeding amongst the low-lying swampy plains of the Benue; and in this respect it is the only antelope which in West Africa reminds one of the stories of the South and East African herds in the early days of exploration.

"Though by no means confining their feeding to the succulent shoots of marshy grass, these antelopes are rarely found far from the swampy marshes of the big rivers. They may wander browsing over intervening stony ridges from one large tract of marsh-land to another, and may in the wet season even lie on the drier upper slopes, but as a rule they prefer the swamps, or rather the flat low ground which is a swamp in the rains and dry in the dry season. When the latter season has been running a month or so, these swamps become dried up, the grass burnt, and the ground baked as hard as a rock; but soon short grass shoots up, and the kobs then confine themselves almost entirely to the flats, lying, after feeding, in compact bodies as far as possible from the edge of the surrounding bush. They do not appear to trouble about shade even at mid-day, but lie out in the full glare of the sun on the hard-baked ground, which is often hot enough to scorch the feet of the natives.

"In hunting the kob when herding together, the difficulty is to get within shot. When feeding, they scatter a little, and it is then more often possible to get within range of an outlying party containing

a decent head; but when lying down, unless they have made the mistake of lying close to a patch of bush, it is almost useless to try to get a head. They lie, indeed, so close together that it is impossible to single out a head from any distance beyond 100 yards; and they will not, at the best of times, suffer an approach nearer than 200 yards. A solitary buck or a pair may, however, frequently be met with on the edge of the swamps; and these give the best chance of obtaining a head. The buck can be watched feeding along until he gets into such a position as to give the sportsman a chance of creeping up within shot, when the stalk can be carried out with little or no difficulty.

"The kob is not a very suspicious or wary animal, and what suspicions it may have are somewhat easily allayed in the case of single animals. More than once I have knelt in full view of a buck, and by remaining absolutely rigid have so soothed its suspicions that it has fed right up to within 50 yards and given an excellent shot. I have also heard of a doe similarly feeding up to within 10 yards of a sportsman who knelt and remained immovable.

"When alarmed and set going, the kob flies off at a leaping gallop, springing over every little obstacle, such as a tuft of high grass, with remarkable ease and much superabundant energy. It will clear a height of six feet in a bound without apparent effort, and appears to delight in the mere act of jumping. It gets through a tract of thick dry jungle grass, 6 to 8 feet high, in a succession of leaps; and there are few prettier sights than that of a buck kob when alarmed traversing such a bed.

"The kob is also a good swimmer, and will not hesitate to cross the Niger or Benue at their broadest parts, 1 to 1½ miles, when alarmed or desirous of changing its feeding-ground. It swims low down in the water, the nostrils, eyes, ears, and horns being nearly all that appears above the surface, and it gets through the water at the rate of about six miles an hour. The flesh of a young buck kob is decidedly palatable, and always an addition to the table of a hunting-camp."

Writing of the Uganda race, Mr. F. J. Jackson observes that, although it was easy enough to detect these antelopes from a "rolling hill-side, as they fed in the swampy hollows in the early morning, when it came to descending the hill and plunging into the tall, thick, and soaking-wet grass it was quite another thing, and was next to impossible to locate them. Even if one struck the right spot the noise made in forcing a way through the grass frightened them away

I have never been to Toru, but from what I have been told by those who have, it would appear to be the headquarters of this kob, particularly that part of the country bordering the shores of Lake Albert Edward near Katwi. Here the grass is not too long, and they can be fairly stalked in the open.

"In Uganda the natives kill, by the aid of dogs, a good many in nets, into which they drive them and then club them to death. They do not spear them, as this would spoil the skins, which are of considerable commercial value, and have a ready sale among themselves after they have been tanned, an art in which the natives are adepts. The horns are used to adorn the long neck-like prows of the canoes.

"These kobs are never found far from water. In Kavirondo, at one time and another, I saw a great many, but never more than 300 or 400 yards from the river-bank. When disturbed, they go off parallel to the river rather than retreat any distance from it, and, like hartebeests, know the advantages of an ant-heap from which to scan the country for approaching danger. This habit appears to prevail much more among the bucks than the does; and I know few prettier sights than to watch one of these bucks standing on the top of an ant-heap in the early morning, doing 'sentry-go,' while the does are quietly feeding round about. His bright colour makes him a conspicuous object at long distances when the sun is low and behind the hunter; but at other times these antelopes are by no means easy to detect, and I have often had them pointed out to me by the natives, and yet have been unable to make them out until either they have moved or I have changed my position by walking to one side, when they appeared in a different light."

THE DUSKY KOB

(*Cobus nigricans*)

To a kob represented by the skin of a female from Sierra Leone the present writer in 1899 (*Proc. Zool. Soc.* p. 794) gave the name of *Cobus nigricans*. Having the general markings of *C. coba*, this skin is distinguished by its dusky colouring, the hairs on the middle of the back being chocolate-brown, while those on the flanks are tawny, gradually passing into the dirty white of the under-parts.

Whether this kob is really a distinct species, a dark race of Buffon's

kob, or merely a melanistic individual of that species, remains to be determined; but I am inclined to think it will prove to be the last-named.

THE PUKU OR PUKU KOB

(*Cobus vardoni*)

Impuku, MASUBIA; *Mutinya*, BAROTSI; *Seula*, CHILALA AND CHIBISA

(PLATE vii, fig. 7)

Discovered, like its near ally the lechwi, during one of Livingstone's expeditions, this antelope differs from the true kob by the uniformly rufous legs, as well as by the greater length of the hair, especially on the back and loins, where it displays a marked tendency to curl. The general colour is bright reddish yellow, with a certain amount of black hairs on the face; and the ears have black tips.

The typical puku stands about 39 or 40 inches at the shoulder, and weighs about 190 lb.; while its record horn-length is $20\frac{3}{4}$.

The species has a wide range in the Chobi and Zambesi valleys (Barotsiland) and Rhodesia.

From the typical race has been separated the puku inhabiting the Senga district in the Loangwe valley, north-west of Lake Nyasa, under the name of *Cobus vardoni senganus*. Slightly smaller than the typical race, the Senga puku has the general colour deeper, and a more decided black tinge on the head of the female. The race was originally described in the *Book of Antelopes*; but specimens from Barotsiland have been referred to it by the present writer on p. 794 of the Zoological Society's *Proceedings* for 1899. These differed from the type by having a white ring above each hoof; and the buck showed no sign of extra blackness on the head.

On p. 283 of the volume of the Zoological Society's *Proceedings* already referred to, the present writer gave the name of *C. v. loderi* to a puku-like skull in the collection of Sir E. G. Loder, characterised by the length and stoutness of the horns and the relative shortness of the skull. Whether this specimen really indicates a puku, or whether it is referable to the black lechwi, is still uncertain.

The following account of the puku is, with some slight verbal alterations, from the pen of Mr. F. C. Selous:—

"During the first day's journey along the southern bank of the Chobi I recorded in my journal that from time to time herds of puku antelopes, disturbed by our approach while feeding close along the water's edge, eyed us curiously and then bounded off into the jungle; and a few days later I wrote in regard to some open stretches of level alluvial ground lying between the bank of the river and the forest-clad ridges to the south, that the number of puku on these flats surprised me. Sometimes troops of more than fifty were to be seen together, males and females mixed, or again small herds of ten or fifteen old rams.

"In 1877 I visited the Chobi a second time, and hunted for several months along its southern bank; but although this was only three years after my first visit when I had found puku so numerous, these antelopes had become excessively scarce, and, in fact, had almost ceased to exist. The extermination of the puku in this part of Africa was due to a political convulsion among the Barotsi tribe on the upper Zambesi, as, during the year 1876, shortly after the assassination of the chief, Sipopo, large numbers of natives fled from their homes on the Zambesi, crossed the swamps of the Chobi, and camped along the southern bank of that river, on the puku ground. As the puku were confined to a narrow strip of ground between the bank of the river and the forest-covered sand-ridges, the greater number was soon shot or caught in pitfalls. During this period of persecution no puku moved either farther westwards along the Chobi, or eastwards along the Zambesi towards the Victoria Falls, for though I found a few still surviving in their old haunts in 1877, there were none either to the east or the west of the small tract of country in which they had been so common in 1874. Both the puku and the lechwi were discovered by Dr. Livingstone, the latter on the Botletli river in 1849, and the former apparently on the upper Zambesi above Libonta in November 1853. When Livingstone and Oswell visited Linyanti in 1851 they crossed the Chobi farther west than the range of the puku; but it is curious that they did not notice any of these antelopes when they visited Sesheke, on the Zambesi, in 1851, as puku must have been numerous in that neighbourhood. Again, in 1853, when Livingstone was journeying up the Zambesi from its junction with the Chobi to the falls of Gonyi, he must certainly have seen many herds of puku, although he does not seem to have noticed them, and makes no reference to the species in the narrative of his travels until after passing Libonta, in northern Barotsiland. A plate in *Missionary Travels*, lettered 'New African antelopes discovered by Oswell, Murray, and Livingstone,' would indeed lead one to suppose that

the puku, as well as the lechwi, was first met with in the Ngami district; but this can scarcely have been the case, as neither Andersson nor Baldwin, who visited the lake shortly afterwards, and were keen naturalist-hunters, ever met with it there, while, so far as I have been able to discover, none of the native tribes living on or near Lake Ngami are acquainted with the puku, and have no name for it in any of their various languages.

"During a canoe-journey down the Zambesi from the Barotsi valley to the mouth of the Chobi in 1888, I found puku thinly scattered along both banks of the river below the falls of Gonyi, but never saw more than seven or eight in a herd. Nowhere in this part of Africa are they likely to be found at the present day in anything but small numbers; but as their range extends right across South Central Africa to Lake Tanganyika, it may be hoped that this species will not become extinct for a long time. As a rule, puku are found in small herds of from three or four to a dozen in number, although, as remarked above, I have seen as many as fifty together in a part of the country where they used to be common. Old rams live alone, or several of them consort together; and I once saw a herd of fifteen composed entirely of old males. I have never met with these antelopes at a distance of more than 200 or 300 yards from the river they frequented; and they are usually found grazing close along the water's edge. In habits they appear to resemble the waterbuck rather than the lechwi, as, like the former, they live on dry ground close to the bank of a river, and lie resting during the heat of the day in the shade of trees and bushes, but are never found in the treeless flooded grass-plains, in which situations lechwi are alone met with. I have never seen puku and lechwi in company, and the habits of the two are so different that I find it difficult to believe that they ever associate, although doubtless they may in some places be seen feeding near to one another. I have, however, frequently seen puku and impala feeding together. These two species stand just about the same height at the withers (about 3 feet), but the heavy, rather clumsy-looking build of the former contrasts strikingly with the light and graceful proportions of the latter. In 1874 I might, no doubt, have secured some fine specimens of puku-horns on the Chobi, if I had shot a number of rams and picked out the heads with the longest; but I seldom interfered with these antelopes, and only shot a few for food, among them two adult rams, whose heads are still in my collection. The horns of both measure 16 inches, which is probably about the average length in full-grown males in that district.

"When a puku antelope is wounded, it does not, as a rule, at once make for water, but usually runs straight away from the river, to seek refuge amongst bush and forest. If followed and hard pressed it will, however, take to the water, and swim boldly across a crocodile-infested stream in order to escape its pursuers. The meat of the puku is inferior to that of any other South African antelope with which I am acquainted, being coarse and flavourless even when the animals are in good condition. Puku does must, I think, drop their young somewhat later than most other South African antelopes, probably in November and December, as I do not remember to have seen any newly-born fawns among the many herds of these antelopes that I saw on the bank of the Chobi in September and October 1874. The puku is not naturally very alert, and when I first met with it, at a time when the country was almost virgin-ground for the European hunter, it always appeared to be duller of sight and more easily approached—against the wind, of course—than any other species of antelope which frequented the same ground. When much persecuted, however, these animals doubtless learn wisdom from experience, and become more wary and more difficult to approach."

THE LECHWI OR LECHÉ

(*Cobus leche*)

Lechwi, BAROTSI AND NGAMI; *Leché* OR *Li-gwi*, MUKOLOLO; *Inya*, MASUBIA; *Unia*, MAKUBA; *Bainanja*, MUSHU KULUMBWI; *Umbundu*, ANGOLA; *Mumembi* (male), *Ngia* (female), CHILALA AND CHIBISA.

(PLATE vii, fig. 8)

With the lechwi we come to the second of the two species of kobs discovered by Livingstone and his companions. From the true kob and the puku this species may be distinguished by its much longer and more slender horns, which exceed twice the length of the head. With the puku it agrees in the length and comparative shagginess of its coat, but it is distinguished from that species by the black fronts of the legs. The hind surface of the pastern is devoid of hair—a character which affords an easy method of distinguishing females from those of the allied species. The general colour is rich rufous, somewhat paler than in the Uganda race of Buffon's kob; the under-parts are white; the legs have the aforesaid black markings; the ears

in the adult are tawny, tending to whitish on the outer border, although black-tipped in the young; and the tail, which reaches to about the hocks, terminates in a small black tuft. The shoulder-height is 40 or 41 inches, and the record horn-length 34½ inches.

"A native of Zambesia and Barotsiland, the lechwi," writes Mr. Selous, "is only found in the neighbourhood of those portions of the larger rivers of Central and South Central Africa where, the banks being low, there are large expanses of country which are always inundated, or in which large shallow lagoons are constantly present, as the result of the annual overflow from the river. It is therefore, or perhaps I ought to say was, particularly common in the open grassy plains always more or less inundated by the overflow from the Tamalakan, Mababi, Machabi, Sunta, and Chobi rivers. In the Barotsi valley, on the upper Zambesi, it used to be very abundant, as also along the swampy rivers flowing into the upper Zambesi from the east, such as the Majili and the Lumbi; but along the course of the Zambesi itself to the south of the Barotsi valley it is nowhere found except in the flat swampy ground between Sesheke and the mouth of the Chobi. In 1878 I met with large herds of lechwi in the swamps of the Lukanga river, a tributary of the Kafukwe, about 150 miles south-west of Lake Bengweolo; and as it has also been described as abundant in the neighbourhood of that lake, as well as on the shores of Lake Mweru, the species must have a more extended range beyond the Zambesi than it has to the south of that river. In 1879 I met with lechwi among some lagoons on the lower Botletli river not far from Lake Komadau, where Dr. Livingstone probably originally discovered this species in 1849. Personally I have never met with lechwi except in flooded ground, or the immediate vicinity of such ground, and, except the situtunga, there is no other antelope in southern or South Central Africa that so well merits the name of water-antelope as the lechwi. Waterbuck, puku, and reedbuck live and feed on the banks of rivers and round the edges of swamps, but all three like to keep their feet on dry ground. The lechwi, on the contrary—at least this was the case wherever I met with this species—spends the greater part of its life knee-deep in water, grazing over flooded plains or in shallow lagoons, where the depth is insufficient to entirely submerge the young reeds and grass on which it feeds. When resting, these antelopes lie either just on the water's edge, or actually in the shallowest water.

"The hoof of the lechwi is longer than that of the waterbuck, reedbuck, or puku; but as the animal frequents flooded ground where the

bottom is firm, it has not developed the excessively long hoofs necessary to prevent the situtunga from sinking in the papyrus swamps frequented by that species. The feet of both lechwi and situtunga are alike, however, in that they are devoid of hair at the back of the main hoofs up to the lateral hoofs, black hairless skin taking the place in both species of the thick covering of hair present behind the hoofs of every other species of antelope found in South Africa.

"As already mentioned, when writing of the first-named species, I have never seen lechwi and puku feeding together, and the two species frequent such different kinds of ground that I cannot believe they would be likely to mingle except under exceptional conditions. It is true that when elephant-hunting on the Chobi I often saw herds of lechwi and puku feeding within a mile, or even half a mile, of one another; but the puku were grazing on the dry ground along the southern bank of the river, where there were no lechwi, while the latter were standing in hundreds, knee-deep or belly-deep in the flooded grass-plains on the other side of the river, where there were no puku.

"The lechwi is the handsomest of the kob group inhabiting the more southerly portion of the African continent; for, though smaller than the waterbuck, it is richer in colour and more graceful in movement; while if the horns of lechwi and waterbuck be compared, the palm must be given to those of the former for elegance and beauty, though they do not attain the same length as those of the larger species.

"There were few more beautiful sights in the interior of South Africa some thirty years ago than the great herds of lechwi which might then be seen scattered over the flooded grass-plains in the neighbourhood of Linyanti on the Chobi river.

"Herds of twenty old rams might often be seen, whilst countless numbers of ewes were scattered over the flooded plains; the larger herds being frequently attended by many males of all ages, from the year-old bucks to the full-grown rams, whose long lyre-shaped horns always make them so conspicuous on the open ground they frequent. I once counted as they ran past me a herd of fifty-two lechwi rams; some were, however, quite young, with horns only a few inches in length, but there was not a single ewe among them. The skin of the lechwi is much prized by the natives, and after being dressed and rendered as soft as chamois-leather, is used either singly as a kind of cloak, or several skins are sewn together to form a rug. Large numbers of these antelopes are annually killed by the natives, who institute drives on

a large scale in order to compass their destruction. They are hunted in canoes, driven into deep water and speared, for although lechwi can swim well and strongly, they cannot swim so fast as a canoe can be paddled. Where they have been much persecuted by the natives they are very wild and difficult to approach in the open ground, but where they have not been much interfered with are very tame, and will allow

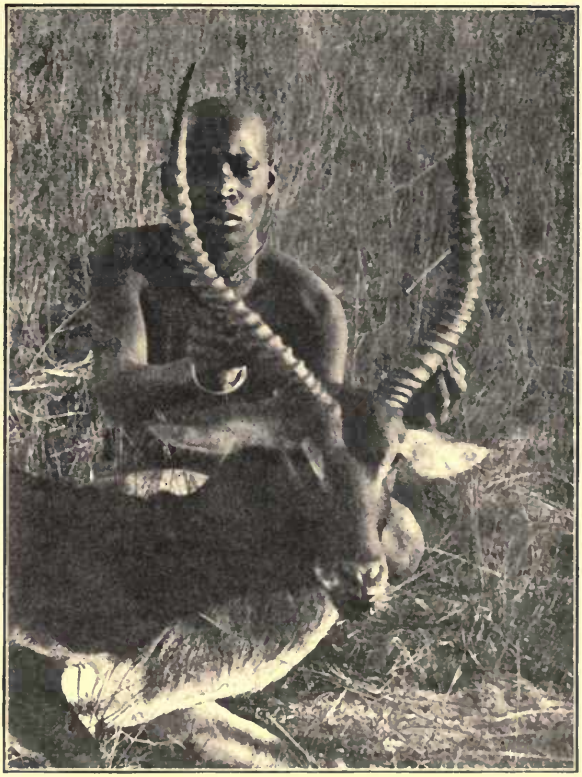


FIG. 44.—Head and fore-quarters of Lechwi, from a photograph by Mr. Poulett-Weatherly.

one to walk up in full view to within 150 yards. When they decide to run, they invariably stretch out their noses and trot leisurely away, the males laying their horns back on each side of their necks; but they soon break into a springing gallop, every now and then bounding high into the air. As they are nearly always in shallow water, the flight of a herd of lechwi is usually accompanied by a great deal of splashing, for even when the water nearly covers their bodies they do

not swim, but progress by a succession of bounds from the bottom. When at last the depth forces them to swim, they show themselves very capable. The young are dropped towards the end of the dry season in October and November.

"The flesh I thought good, though the fat is hard and clogs on the teeth and the roof of the mouth whilst being eaten. I once saw a wounded lechwi that was lying down spring forwards and drive the point of one of its sharp horns right into the chest of a Kafir who was approaching in face of it, puncturing one of his lungs and inflicting what might have been a bad wound. I was, however, close behind, and when it sprang forwards the Kafir was stooping to seize it by the horn, and I believe that it injured him only by accident, and was really trying to escape. At any rate I have never seen any other buck of this species make an attempt to defend itself with its horns when wounded. The lechwi is very tenacious of life, and I have been astounded at the distance one of these animals has run after being shot through the heart."

THE BLACK LECHWI

(*Cobus smithemani*)

Closely related to the last, this species was named by the present writer in the Zoological Society's *Proceedings* for 1899 (p. 982) on the evidence of the flat skin of a buck obtained by Mr. F. Smitheman in the Lake Mweru district of Barotsiland. Young males, and females at all ages, appear to be coloured much the same as in the true lechwi; but in the fully adult bucks the upper-parts of the body and the front and outer surfaces of the limbs, with the exception of a portion of the thighs, become dark blackish brown; the dark area also extending along the sides of the neck as far as a line connecting the ear with the gape of the mouth. The back is, however, lighter than the flanks, and the face is wholly chestnut.

This species appears to be confined to the Lake Mweru district, including part of north-eastern Rhodesia. From the latter district an antelope has been described by the Hon. Walter Rothschild on p. 237 of the Zoological Society's *Proceedings* for 1907 as a new species, under the name of *Cobus robertsi*. It appears, however, to be based on the skin and horns of an immature buck of the present species.

THE REEDBUCK

(*Cervicapra arundinum*)

Rietbok, CAPE DUTCH; *Bemba*, MASARA; *Bushmat*, SUDANI; *Iklabu*, BASUTO; *Im-vwi*, MASUBIA; *Impoyo*, LOWER ZAMBESI; *Inhlango*, SWAZI; *Inzigi*, AMANDEBILI; *Mpoyo*, CHILALA AND CHIBISA; *Mutobo*, BAROTSI; *Mziki*, ZULU AND MATABILI; *Natafwi*, MASHUKULUMBI; *N'tobi*, M'KUA; *Sibughat*, NGAMI; *Umvwi*, MAKUBA.

(PLATE viii. fig. 1)

The presence of a large bare or short-haired glandular patch on each side of the head just below the ear (corresponding to the smaller one of the oribis), coupled with the comparatively short and bushy tail, serves at once to distinguish the reedbucks from their near relatives the waterbucks and kobs. Reedbucks are also lighter and more gracefully built animals than kobs, with relatively smaller lateral hoofs. The horns of the bucks (unlike those of the waterbuck group) are jet-black, and of short or medium length; they diverge regularly from the skull usually at an angle of about 45°, and are directed upwards and outwards, with a forward curvature at the tips, which may form a distinct hook. Till very late in life the base of each horn forms a soft pasty mass. In the skull the front upper jaw-bones, or premaxillæ, do not extend upwards and backwards to join the nasal, or nose, bones.

The typical reedbuck, that is to say the present species, is the largest representative of the group, standing 36 or 37 inches at the shoulder, and having the ear-patch completely bare, and the relatively large horns curving regularly forwards, without a distinct hook at the tip, and diverging at an angle of about 45° from the skull. The general colour of the upper-parts is ashy brown with a strong tinge of yellow, darker on the back than elsewhere, and gradually lightening towards the under-parts, which, like the inner surfaces of the upper portions of the limbs, are yellowish white. The head, in which the face-glands are small, is pale ochery brown; the long and rather sharply-pointed ears are thickly haired internally; and the short bushy tail is brownish yellow above and white beneath.

As indicated by the long list of native names given above, the reedbuck has an extremely wide geographical distribution, ranging on

the western side of the continent from the Cape to Angola, and on the east extending through Mozambique and south Nyasaland to about 8° 25′ N. latitude in the Bahr-el-Ghazal province of the Sudan.

The fact that the species ranges so far north as the Bahr-el-Ghazal is demonstrated by the heads of two bucks killed in that province by Captain P. E. Vaughan, one of which is exhibited in the British Museum (Natural History). The animals to which these heads belonged were killed in latitude 8° 25′ N. That this Bahr-el-Ghazal reedbuck is specifically identical with the South African animal will be at once apparent by an inspection of the heads of the two placed one above the other in the Natural History Museum. Indeed, the only noticeable differences between the two are the somewhat lighter colour and slighter build and horns of the northern animal. In the latter respects the Bahr-el-Ghazal head confirms Mr. Vaughan Kirby's opinion with regard to the South Nyasa reedbuck, which he describes as smaller and lighter in build than the Cape animal. Such insignificant differences are, however, too slight as a foundation for racial distinction. This northern range of the reedbuck brings its distributional area within (for Africa) a comparatively short distance of that of the addax, a species which Captain Vaughan has killed in Nubia as far south as latitude 17° 15′ N. And we thus have what have generally been regarded as essentially a northern and a southern type coming within ten degrees of latitude of one another. This and other facts lead to the belief that such North African animals as the addax, the white oryx, and the bubal hartebeest are essentially wanderers from Ethiopian Africa, which have become specially adapted for a desert existence, and have, therefore, been enabled to travel northwards.

Despite the apparent close similarity of the Bahr-el-Ghazal to the Cape form of the species, the reedbuck of northern Rhodesia has been separated by the Hon. Walter Rothschild (*Proc. Zool. Soc.* 1907, p. 237) as *Cervicapra arundinum occidentalis*, on account of the paler and more greyish rufous head and neck, and the pale rusty grey of the limbs, tail, and body.

This grey tendency becomes still more pronounced in certain reedbuck obtained on the Songwi river, a few miles from its entrance into Lake Nyasa, which, with the exception of the normal black markings on the limbs, are wholly of a bright bluish French grey. On page 429 of the Zoological Society's *Proceedings* for 1900, Dr. P. L. Sclater described these Nyasa grey reedbuck (of which some eight specimens had then been seen or heard of) as a new species, with the name of *C. thomasinæ*. They are, however, at most, only a local race, and not

improbably represent a grey phase, such as is not uncommon among hares in East Anglia, this phase being perhaps confined to the members of a single family.

The following sporting account of the reedbuck in south-eastern Africa is from the pen of Mr. Vaughan Kirby :—

"At one time these antelopes were numerous in Natal, Zululand, and Bechuanaland, but there are now few remaining in these countries. In the Transvaal and Swaziland they were exceedingly numerous in certain localities, but their numbers have appreciably diminished, particularly in districts that have become populated. They are still common in Amatongaland, Gazaland, in Portuguese East Africa, along the Zambesi and Chobi rivers, and in Ngamiland. Wherever I have met with reedbuck in the Mozambique province, in southern Nyasaland, and Portuguese Zambesia, it has appeared to me a far lighter-built animal, with a maximum weight of 110 to 120 lb. Reedbuck are chiefly found in open rolling grass-country on the mountain plateaus, where water is abundant, and in reedy valleys and thin open forest throughout the 'low country,' but never far from water. As their name implies, they are partial to dense reed-beds, but quite as frequently lie-up in long grass-covert on the high ridges, or in cool spots in thin forest ; they invariably lie in dry places, even if near water. They often lie very closely, and when disturbed rush out with great speed, seldom or never whistling, but going off at once with long easy bounds, presenting each flank alternately to the sportsman, and thus offering a none too easy shot. If disturbed at a little distance, they whistle sharply and go off deliberately, raising and lowering their 'flags' in a characteristic manner, and usually standing at about 120 to 150 yards to look back at the cause of the alarm ; then, whistling again, they once more bound off, frequently repeating these manœuvres if not fired at. The ewes are less inclined to stand than the rams, and can run with great speed and endurance. At night reedbuck often play around a camp for hours, whistling constantly. Though little family parties of four or five are not unfrequently seen, they usually associate in pairs ; but I have seen ten or twelve feeding together on a patch of green sprouting grass. They are solely grass-feeders, and their flesh is second in flavour only to that of the bushbuck, many persons considering it superior to that of all other small game. It has been said that these antelopes are shy and retiring, but my experience is the very reverse ; the surest places in which to look for them being the patches of covert in the vicinity of native kraals, especially amongst the luxuriant weed-

tangle which grows up in old plantations. They are very partial to the young maize-sprouts.

"The young are born between December and March, earlier in the low country than on the mountain plateaus, their fur being woolly and rufous brown in colour.

"In the old days the favourite style of hunting reedbuck was to ride over suitable country on horseback, taking one likely patch of scrub after another; or, if a party, to ride in line through them, then, as the buck jumped up, to dismount and take the shot as it galloped off. Reedbuck may, however, be stalked in the evenings or early mornings without much difficulty, as they are not very wary. When pursued, they rarely take to boggy ground, although I have seen them go through such places; but, as a rule, they will almost run any risk in preference. I have, however, known reedbuck, wounded and unwounded, take to water, when they sink themselves almost entirely below the surface, so that only their noses and horns remain above. I have only once known a reedbuck use its horns, on which occasion it thrust them about three inches into the ribs of one of my dogs. Reedbuck, although very tenacious of life, show a wound quicker than bushbuck. The latter droop the tail and run *fijnig*, as the Boers say, while reedbuck, though they may continue to show the 'flag,' constantly shake their ears, and look 'crimped-up' and generally demoralised. When badly hit they often take to dense covert."

THE MOUNTAIN REEDBUCK OR ROOI RHEBOK

(*Cervicapra fulvorufula*)

Rooi Rhebok, CAPE DUTCH; *Inhlango'matsche*, ZULU AND SWAZI

(PLATE viii, fig. 4)

On account of its mountain-haunting habits, so unlike those of the typical reedbuck, the Boers believe this species to be a near relative of the true or vaal rhebok, and consequently distinguish it as the rooi (red) rhebok. From the typical reedbuck it is readily distinguished by its inferior size, the height at the shoulder not being more than from about 28 to 30 inches. The horns of the bucks are of the same general type as those of *arundinum*, having no distinct terminal hook, but they are perhaps more sharply bent forwards near the middle and have fewer rings. The general colour is greyish fawn, with, in some

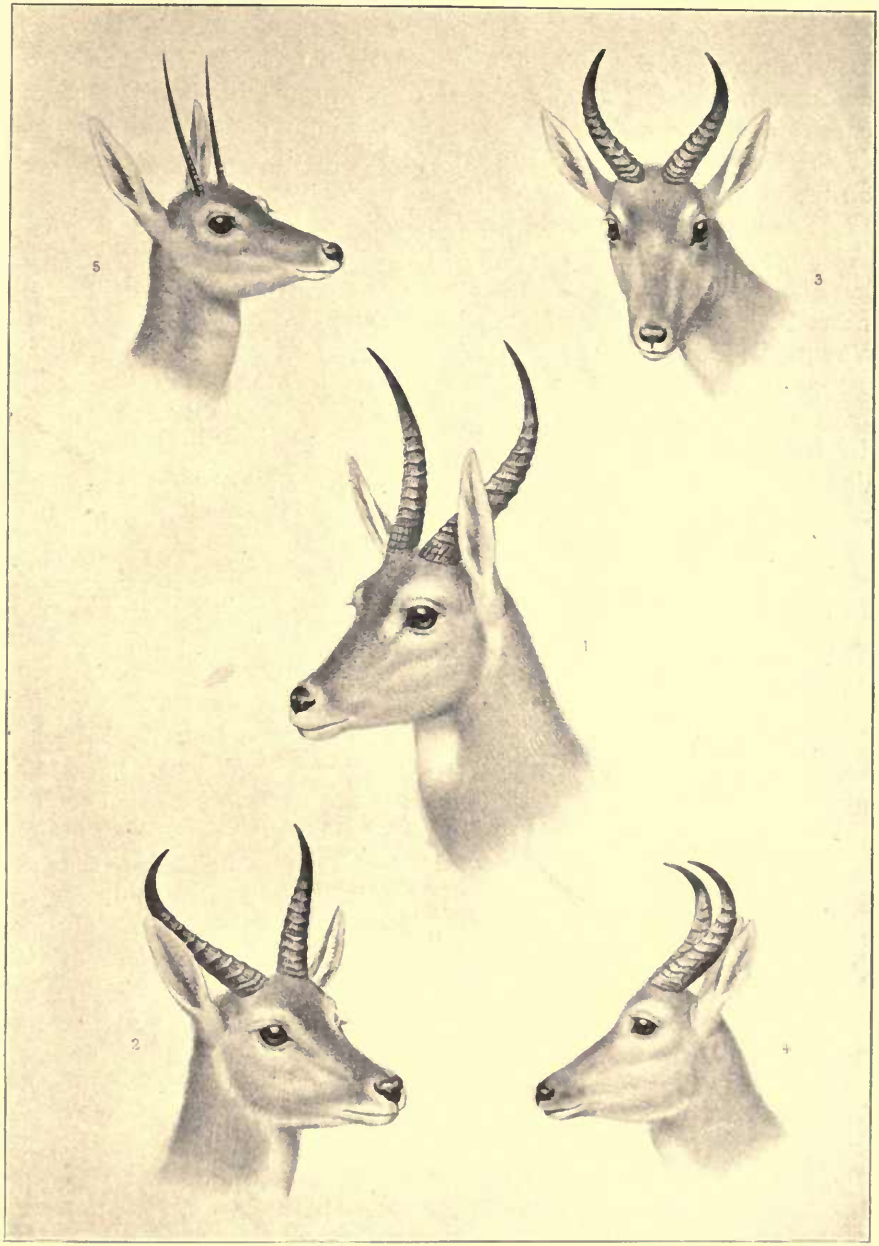


PLATE VIII

1. Reedbuck.
2. Abyssinian Bohor Reedbuck.
3. Western Bohor Reedbuck.
4. Mountain Reedbuck.
5. Vaal Rhebok.

cases, a more or less decidedly rufous tinge—indeed, Mr. Vaughan Kirby describes it as being usually warm red-brown, passing into buff on the cheeks and throat, and into white on the under-parts and inner sides of the limbs. As in the typical species, there may be a dark mark on the nose.

The range of the typical race includes a large portion of eastern Africa to the south of the Zambesi; Natal, Zululand, and Bechuanaland being some of its strongholds. Certain mountain-reedbuck from near Lydenberg, in the Transvaal, have been described by Mr. Vaughan Kirby on p. 879 of the Zoological Society's *Proceedings* for 1897 as a distinct form—*Cervicapra fulvorufula subalpina*. It is, however, more probable that they indicate a semi-albinistic "sport." In both sexes, of all ages, the limbs were white from the knees downwards, inclusive of the hoofs; the tail was also white, both above and below; and there was a white patch on the forehead, as well as an imperfectly defined white dorsal stripe.

The Kenia representative of this reedbuck, first described by Mr. Rothschild in *Novitates Zoologicæ*, vol. ii. p. 53, 1895, is generally regarded as a distinct race, *C. f. chanleri*. It inhabits the Kenia and Lake Rudolf districts, and is characterised by its grey tone of colour, and the presence of a dark streak down the nose.

To the reedbuck of this group inhabiting Shoa and Abyssinia Mr. O. Neumann (*Sitzungs-Berichte Ges. Naturfor. Berlin*, 1902, p. 99) has given the name *C. f. shoana*. It differs from *chanleri* by the absence of the dark nose-streak, and in certain details of the skull and horns.

In an account written some years ago Mr. Vaughan Kirby remarks that "these antelope are still fairly numerous in the south-eastern districts of Cape Colony, in parts of Bechuanaland, Swaziland, and the Transvaal. In the latter state, on the Drakensberg, particularly around the Mauchberg, and the Blyde and Oliphants River Poorts, they are very common; but I have nowhere met with them north of the Limpopo. They are partial to rugged, hilly country, though shunning bleak, barren mountain summits. Their favourite spots are amongst the scattered 'sugar-bushes' and dry grass on the sunny slopes and in shallow gullies; and in such places they are far more approachable than the rhebuck on the summits. At one time they were numerous amongst the foot-hills and on the lower terraces; but such places invariably become inhabited, when the antelope that are not destroyed seek safety at higher elevations; and years ago I have seen them among the rocky *kopjes* on the flats between the Sabi and Crocodile rivers. They associate either in pairs or in small herds of five or six

to a dozen in number, solitary old rams being often met with. They drink regularly once a day and are entirely grass-feeders; but their flesh, though more palatable than that of the rhebuck, is decidedly inferior to that of the typical reedbuck. When running, they much resemble the latter; the spread tail and peculiar rocking-horse action when they are not laying themselves out to run hard being characteristic of both.

"Mountain-reedbuck shooting is really fine sport, which can usually be obtained in the course of a day's mixed shooting on the hills when the sportsman is also prepared for vaal rhebuck, oribi, and klipspringer. It is, however, more satisfactory to deal with the different species separately; and, in order to obtain the greatest success, early rising and some knowledge of their habits are indispensable.

FIG. 45.—Head of Mountain Reedbuck.

"Mountain-reedbuck invariably run either round or obliquely down a hill, seldom climbing as the rhebuck does. When lying down, if they think themselves unseen, they will often permit a very near approach. An instance of this occurred when I was shooting on the Drakensberg. Returning on foot to camp in the evening, I saw a fine ram crouch down behind a bush. In order to obtain a shot when he jumped up, I had to manœuvre to the left for about 50 yards over ground which was quite open save for a few scattered 'sugar-bushes'; but I gained my point about 140 yards from the ram, which lay in a little hollow, squeezing himself into a very small compass. I was in the act of raising my glasses when my eyes fell on a ewe lying flat on

the ground not more than fifteen paces distant. She knew instinctively that she was discovered, and instantly jumped up, followed by the ram, which fell a moment later to a Metford bullet. To have stalked the ewe intentionally to such close quarters would have been impossible, but in this case she knew she had not been seen, so lay low. In the middle of the day it is best to hunt these antelopes from the saddle, as it will be found necessary to cover much greater distances. If the sides of the hills are too steep for riding, the horse can be led along the top, and stones thrown into the kloof, when a fair chance will be obtained as the game runs out on the other side. These antelopes may almost invariably be brought to a stand, after they have started to run, by a sharp whistle."

Writing of the East African race, Mr. F. J. Jackson observes that "it has a fairly wide range, and is found in the Kiyu hills south of Machakos on the eastern side of Mount Kenia and west to the Ravine Station on the eastern slopes of Mau. It is, however, very local, and only found in hilly country, where it frequents the roughest and most broken rocky slopes. Amongst other places where it may be found are the Kiyu and Mwani hills, and the eastern rocky slopes of the Kedong valley. It is smaller and more slender than the bohor reedbuck, from which it may readily be distinguished by its stony grey colour. The horns are also smaller and thinner, a good pair being from 6 inches to 7 inches in length. It is usually found in small lots of two or three; but in the Keya hills I have seen five together. Its note of alarm is a shrill whistle, not so loud as that of the bohor reedbuck. Early morning and late evening are the best times to look for it, as it is then feeding, and the chances of seeing it are better; but it is by no means easy to make out on account of its colour assimilating so closely with the grey rock and stones amongst which it is found. During the greater part of the day these reedbuck lie up under the shade of some big boulder or bush, when they are practically invisible. If sought for at other times the stalker should keep along or near the tops of the rough rocky spurs, as these antelopes, like most hill-game, appear to be more intent on watching for the appearance of danger from below than from above."

The record horn-length for the mountain-reedbuck is $8\frac{7}{8}$ inches; the pair with this length having been obtained by Mr. Vaughan Kirby at Humansdorp.

THE BOHOR REEDBUCK

(*Cervicapra redunca*)

Wonto, GAMBIA ; *Baroufa*, GALLA ; *Porhi* OR *Tohi*, SWAHILI ; *Behor* OR *Bohor*, AMHARIC ; *Njasa*, WAGANDA ; *Duika*, KÄO

(PLATE viii, figs. 2, 3)

Although the name bohor refers to the northern race, this species is typically West African, and is nearly of the same size as the mountain-reedbuck, from which it is distinguished by the sharp forward curvature of the tips of the horns of the males so as to form hooks. The general colour is uniformly bright fawn, usually with somewhat darker markings on the face and a dark stripe down the front of the fore-legs from the knee to the fetlock, while there are light rings round the eyes. The tail, which is fawn-coloured above and white below, is less bushy than in the other species. The height of the West African race has been given at 28 inches, but the Sudan or the Uganda race is stated to stand at least 30 inches at the shoulder. The record horn-length for the typical Gambian or Western race is $10\frac{3}{8}$, and for the Sudan race $14\frac{1}{4}$ inches.

The following five races were recognised by the Hon. Walter Rothschild in the Appendix to Major Powell-Cotton's *Sporting Trip through Abyssinia*, published in 1902 :—

In the typical Western, or Gambian, race, *Cervicapra redunca typica*, inhabiting West Africa north of the forest-region, the horns are short and stout, very thick at the base, and curved in front, with the points turned inwards.

The Sudan race, *C. r. cottoni*, from Kordofan, the White and the Blue Nile, and the Isle of Meröe, has the horns long and thin, much curved outwards and backwards, with the points curved straight over or directly outwards.

In the Abyssinian race, *C. r. bohor*, of central Abyssinia, the horns are long, stouter, and not so curved as in *cottoni*.

The Somali race, *C. r. donaldsoni*, from the east of Lado and western Somaliland, has the horns long, slender, and curved outwards, with the points much turned inwards.

In the Uganda race, *C. r. wardi*, from Uganda and the east coast of Africa, the horns are short, stout, and curved outwards, with the points much turned inwards.

The type of *C. r. cottoni* was obtained between the Bahr-el-Zerafe and Bahr-el-Jebel, and others have been brought from Ferik Mabyn, fifteen miles north of Achmed Agar.

FIG. 46.—Uganda Bohor Reedbuck.

According to Mr. Rothschild, the main difference between *bohor* and *cottoni* is that in the latter the horns spread outwards much more abruptly from the base and are directed much farther backwards and upwards, and the points turn outwards or are bent straight forward and hooked right over, while in *bohor* they rise much straighter from

the base, and the points either curve forwards and inwards, or are directed straight upwards.

Writing of the Sudan race, Major Powell-Cotton observes that these reedbuck "generally lie down among the long grass by a stream during mid-day. I tried walking them up, but they always broke too far ahead for a shot, and, if you went forward, they would drop into the water-course and get away. If they sight danger at a good distance when feeding in the open, they will lie down by any tuft of grass, so it is as well to mark the place very carefully before starting a stalk, and even if they have disappeared go right to it. On very open ground I once or twice had them moved successfully to me. I saw them down in the hot country at Shimerler Jowee, but only shot a small one, which I did not keep. They are found at Zoquala, below Adis Ababa. Whenever they are near a trade-route or large town, they are much shot at, and consequently very hard to approach."

FIG. 47.—Head of Sudan Bohor Reedbuck, from the Blue Nile.

Of the Uganda race, Mr. F. J. Jackson observes that it was common in 1887 in "the Kilimanjaro district, along the banks of the Wevi-Wevi river, and there were also a few on the edge of a large swamp east of the Rombo plains. Farther north there are a fair number in the marshy ground north of Lake Eliniteita, and on the eastern slopes of the Mau escarpment in the vicinity of the Ravine Station, at an altitude of 7500 feet. Its real home is, however, the rolling grassy downs of the Mau plateau, where it is very abundant along the courses of the numerous streams which flow into the Nzoia river. The country is very undulating, and the small streams running along the hollows in the low-lying places

overflow their banks and form marshes of several acres in extent, in which tall reeds, bulrushes, and other water-plants flourish and afford both good feeding and covert for this buck. Never found far from water, these reedbuck lie up in covert during the heat of the day; but in the early mornings, up to about 8.30 A.M.,

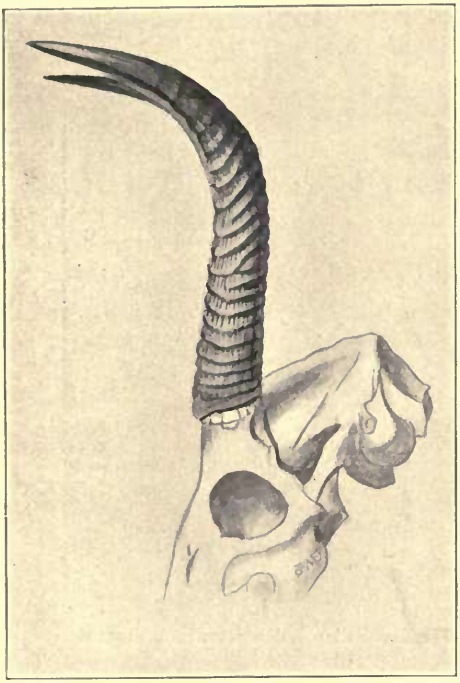


FIG. 48.—Side view of Horns of Abyssinian Bohor Reedbuck.

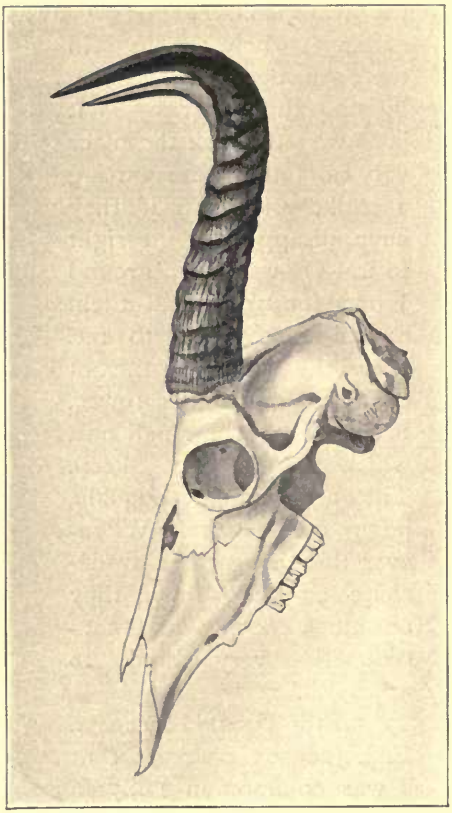


FIG. 49.—Side view of Horns of Sudan Bohor Reedbuck.

are found either feeding in the hollows or wandering about in search of suitable places in which to lie down in till about 4 P.M., when they are once more on the move. The early morning and evening are therefore the best times to look for them, as they are easier to see and can be fairly stalked. Throughout the rest of the day it is mere chance coming across them at all. They lie, if anything, closer than oribi or duiker, and if seen at all when they

move at close quarters, they go off at first with a rush, and in a crouching position with the neck held straight out, and the head so low as to prevent one from seeing whether it is a buck or doe, and thus offer a very difficult and uncertain shot with a rifle, as they almost invariably go straight away and double from one side to the other with such extraordinary speed that it is almost impossible to draw a bead on them. They are usually found in small parties of two

FIG. 50.—Front view of Horns of Abyssinian Bohor Reedbuck.

or three, but sometimes as many as five or six, and on one occasion I saw eight. Old bucks are frequently found by themselves. During the rutting-season, which is towards the end of June or the beginning of July, the young bucks are driven from the herds by the older and stronger animals, and are found in small parties of three or four—these bucks being never worth shooting. The reedbucks found on the Mau plateau are finer and heavier than those found on the eastern slopes of the escarpment, and in the Masai valley, and also have much finer heads. The best can, however, in no way be compared with the heads

of reedbucks from South Africa, as horns of 10 inches along the curve may be considered very good. The note of alarm is a shrill whistle, which can be heard at long distances, but is rather difficult to locate.

"If circumstances allow of a choice, by far the pleasantest time to look for these bucks is the cool of the evening, when they are on the move and feeding. The wind is then steady, and the grass dry; and they are not likely to move far from the spot where last seen. Even if alarmed by the warning whistle of another buck, which may be standing some distance off and not noticed by the stalker, they will endeavour to escape observation by crouching down in the grass rather than seek safety in flight."

In reference to the western race, Mr. Percy Rendall observes: "A young animal that I reared on the Island of St. Mary, at Bathurst, was caught in the upper reaches of the Gambia river by a native. After four months on milk from a feeding-bottle, I weaned it to dried ground-nut grass (*Arachis hypogæa*). For the first six months the tear-glands were a marked feature on its face, and it was quite white on the chest and under-parts. As it grew older, however, the tear-glands were hidden; it then became darker, and its coat grew twice as long as before, the white of the under-parts deepening into a light mouse-brown. The horns were cut at six months old, and altered their direction several times before the animal entered the gardens of the Zoological Society of London in June 1890. It became extremely tame, would follow me about like a dog, and eat out of my hand; it was very fond of the flat, curled seed-pods of a mimosa-tree, with yellow tasselled blooms, which grew in my compound."

Writing of the Sudan race, Vicomte Edmond de Poncins mentions that "these antelopes are very numerous in the Galla country near Mount Yokoila; they like open grassy plains, more or less dotted with mimosa-bushes, and are found in small herds of from four to eight, sometimes even fifteen or twenty. They are not very wild, and may be easily stalked at less than 200 yards in the middle of the day. Old males frequently are found in the long grass quite alone, when, if disturbed, they gallop through the grass, jumping very high; on the plains they go easy and fast without jumping. The flesh is not bad eating, and the Gallas are very keen about getting the skins. The weight is about 80 lb."

THE GREY OR VAAL RHEBOK

(*Pelea capreolus*)

Vaal Rhebok, CAPE DUTCH; *Iliza*, ZULU AND SWAZI; *Pshiatla*, BASUTO

(PLATE viii, fig. 5)

A very different antelope from either of the preceding groups of the *Cervicaprinæ* is the grey rhebok, or vaal rhebok, the sole member of its genus. Its most distinctive features are its medium bodily size, the short, upright, and nearly straight horns of the male, which are ringed for about half their length, the somewhat woolly hair, and the short, bushy tail. The naked portion of the muzzle is relatively large, and there are no glands on the face or bare patches below the ears. The skull is very similar to that of the reedbucks, showing the deep pits in the forehead found in all the members of the subfamily. The ears are long and narrow; the build is slight and graceful; and the general colour is pale grey, tending somewhat to fawn on the head and limbs, paler on the throat, and white on the under-parts. The shoulder-height is from 28 inches in the female to 30 or 31 inches in the male; and the record horn-length 11½ inches.

The species is found only to the south of the Zambesi, where it inhabits open hilly districts.

The following particulars of the range and habits of the vaal rhebok are abbreviated from an account furnished by Mr. Vaughan Kirby:—

"Although a mountain-loving species, its habitat is by no means so strictly confined to the range-summits as has been stated. Some years since these antelopes were common on the middle and lower terraces of the Drakensberg mountains, in the eastern Transvaal; and their range extends from the south-eastern districts of Cape Colony, through the Orange River Colony, Bechuanaland, Natal, Zululand, and parts of Matabililand. On the lower terraces they repose during the day among out-cropping rocks or patches of bracken, while on the mountains they lie among the stones or in little gullies on the sheltered slopes, or on open stony tablelands. At night they descend to lower ground to drink, and to feed in the sheltered hollows, making their way back to higher ground at sunrise. They are grass-feeders, and their flesh is poor. During very dry weather they are attacked by

bots, which burrow under the skin of the back, and raise excrescences. Rhebok associate in pairs, or in herds of six or eight to fifteen or twenty in number; but occasionally old rams lead a solitary life. Their activity is boundless, and their energy untiring; and, although presenting a somewhat stiff and stilty appearance when at rest, they quickly belie their appearance when they start to run. The brown-grey fawns, which are born between mid-November and Christmas, are skilfully hidden by their dams in patches of grass amongst the boulders. While the fawns are very small, the ewes feed near at hand, and permit an intruder to approach much nearer than would otherwise be the case.

"No other antelope in Africa affords truer sport than the rhebok, for none is so shy and difficult of approach; it is sport for princes, and only by energy, perseverance, and the possession of good health will success be achieved. To attempt to approach rhebok from below, when they are occupying a mountain-summit, is almost useless. In most cases they know instinctively that they are discovered, and directly the sportsman disappears from view, in his endeavour to work round them, they make off; and while the former, half an hour later, is congratulating himself on the near completion of a successful stalk, he will suddenly hear a distant 'tshu! tshu!' and see his would-be victims on a ridge, 500 or 600 yards away, stamping their feet, and uttering again their mocking 'tshu!' The best sport can be obtained if there are two guns, when the sportsmen, whether on foot or in the saddle, can separate, and keep the rhebok moving about from one to the other. When stretching themselves out to reach a point from which they fear being cut off, rhebok take, however, some straight shooting; and when racing down a rocky hill-side they will be missed ninety-nine times out of a hundred. They are tough animals, and, even if badly hit, give a deal of trouble before they are secured."

With this genus we come to the end of the antelopes included in the subfamily *Cervicaprinæ*, and pass on to the gazelle group (*Antilopinæ*), which comprises pala, gazelles, dibatag, gerenuk, and beira.

THE PALA OR IMPALA

(*Æpyceros melampus*)

Rooi-bok, CAPE DUTCH; *Impala*, ZULU, SWAZI, AND MATONGA; *Pala*, *Palla*, BASUTO, BECHUANA, AND WAGANDA; *Nswala*, LOWER ZAMBESI; *Inzero*, MASUBIA; *Swala*, SWAHILI; *Luondo* AND *Nipala*, BAROTSI, NGAMI, CHILALA, AND CHIBISA.

(PLATE v, fig. 7)

The pala is the first representative of the typical subfamily of the antelopes—the *Antilopinæ*; a group differing from most of those already considered in its much wider geographical distribution. Several of the genera, for instance, like the typical *Antilope* (blackbuck), are exclusively Asiatic, while others, like *Gazella*, are common to Asia and Africa, and others, again, such as the present, are restricted to Africa south of the Sahara. As distinctive characteristics of the subfamily may be mentioned the medium or small size of the species, the hairy muzzle, and the generally short tail. Face-glands may be present or absent; the upper cheek-teeth are tall and narrow, like those of sheep; another sheep-like character being the presence of only two teats in the females of all the species except the Asiatic saiga. As a rule, the skull has gland-pits below the eyes, unossified spaces in the neighbourhood of the nose-bones, and deep pits on the forehead like those of the *Cervicaprinæ*. With the exception of the springbuck and the majority of the gazelles, horns are developed only in the males; in most of the African members of the group these approximate more or less to a lyrate form, and are always heavily ridged for the greater part of their length.

The two species of pala are some of the largest members of the group, easily distinguished from the rest by the absence of lateral hoofs, and the presence of glandular tufts of black hair above the hind-hoofs (whence the name *melampus*). The head is devoid of face-glands, the tail is of moderate length, and the skull has small pits above the eye-sockets, while the unossified vacuities in the neighbourhood of the nose-bones are small. The horns of the males are long, and curved into a broadly lyrate form, with the ridges confined to the front surface, but extending throughout the greater part of the length; they are somewhat compressed laterally. The short and glossy hair

is uniformly foxy red on the upper-parts, with a black patch on the crown of the head, black tips to the ears, an indistinct brown dorsal stripe, continued as a black stripe down the tail, a crescentic black streak on the buttocks and thighs, and the aforesaid black tufts on the hind-fetlocks. A patch round each eye, the lips, a narrow throat-band, and the under-parts are white, as are the sides, tip, and under surface of the tail. The shoulder-height of the bucks ranges from about 34 to 38 inches, and the weight from about 130 to 160 lb. The record horn-length is $31\frac{1}{4}$ inches.

Typically a southern species, the pala ranges along the eastern side of Africa as far north as the southern districts of Kordofan.

The Nyasa pala, on account of its apparently smaller size, was separated by Mr. O. Thomas on p. 553 of the Zoological Society's *Proceedings* for 1892 as *Æpyceros melampus johnstoni*, but the distinctness does not seem to hold good. In 1894 Dr. von Lorenz (*Ann. Hofmuseum Wien*, vol. ix. p. 62) gave the name of *Æ. m. holubi* to the pala of Zambesia; while Dr. P. Matschie (*Sitzungs-Berichte Ges. Naturfor. Berlin*, 1892) has distinguished the Uganda and Kilimanjaro representative of the species as *Æ. m. suaræ*. At best, however, these local forms differ but very slightly from the typical southern form.

In this place it may be well to mention that the horns of young palas, when only about a foot in length, have their tips inclined inwards, and occasionally even crossing. This is due to the rotation of the horny sheaths on the bony axis during growth.

In many parts of its range the pala has been greatly reduced in numbers, while in places it may even have been exterminated. A few years ago, according to Mr. Vaughan Kirby; these antelopes were, however, still common in parts of Portuguese East Africa, and along the upper Zambesi and eastern Mashonaland, but throughout the Mozambique province they appear to be unknown.

"Impala," writes the same sportsman, "are strictly gregarious, ranging in troops of from ten or twelve to larger ones whose numbers could scarcely be computed. The number of females is greatly in excess of that of the males. Large troops of the former, with perhaps a few half-grown males, but not a single big ram, are frequently seen; and I have met with troops consisting of twenty or thirty males alone. They are partial to open woodland and low, sandy bush-country, and are seldom seen more than a couple of miles from water. In the eastern Transvaal they are invariably found among 'impala-bush,' with which immense areas of the 'low country' are covered. They are grass-feeders, but I have at times seen them eating the leaves of certain

bushes. They drink regularly three times a day—morning, mid-day, and evening—and even oftener in very hot weather. Their leaping powers are extraordinary; and I have been told, on credible authority, that a ram was once seen to clear a distance of 35 feet. I have, however, only once obtained a record of the distance covered, which measured 70 feet in three leaps of 26, 16, and 28 feet. It is one of the prettiest sights imaginable to see a troop streaking in a red line through the bush, and bounding over the scrub; six, eight, or ten at a time leaping high over the backs of the others. I am not certain about their staying power, but for a short distance they seem the fleetest antelopes in South Africa. Impala feed and stand more or less throughout the day, but solitary males lie down.

"Large numbers are destroyed annually by lions and leopards, the nature of the country they inhabit favouring the stealthy advance of these creatures. When once a troop starts to run in a particular direction, scarcely anything will turn them, and if, after alarming them, the sportsman runs through the bush to cut them off, they will pass within a few feet of him, merely 'putting on steam,' bending lower to their work, and performing prodigies of leaping. In October the ewes become very fat, and afford excellent meat; but in very dry seasons they are much troubled with bots. The young are born in November and December. During the rutting-season the rams constantly utter loud, hoarse, guttural sounds, audible at a great distance, day and night: at such times they are particularly easy to stalk, and often fight fiercely amongst themselves. They utter a short bark sometimes when alarmed, but their usual warning-note is a loud snort, particularly when they sight a lion or leopard.

"They are easy animals to stalk, but unquestionably more tenacious of life than any of the smaller, if not of the larger, antelopes; and, unless hit in a vital spot, will certainly be lost in the thick bush they frequent. When hunting one morning in the Matamiri, and endeavouring to stalk a big impala ram—one of a troop which stood on the far side of an open glade—as I approached, another herd ran out from my left into the glade and ranged themselves on the side nearest myself. All were evidently intent upon something else, and permitted me to approach within twenty yards. I put up my rifle, and was trying to get a sight on the big ram, when a chorus of angry snorts and barks broke from them, and two ewes bounded across the space between the two herds, closely followed by a leopard. The latter pulled up in the middle of the glade, his flanks heaving heavily, and his tail twitching angrily. The impala never moved, but with outstretched necks, and

stamping feet, made a great din with their loud snorts, till the report of my rifle, and the hoarse growling of the leopard as it rolled over in its death-throes, sent them flying on winged feet in all directions."

The following account of the pala in British East Africa is abbreviated from one furnished by Mr. A. H. Neumann :—

"The species has a wide range in East Central Africa, but its distribution is patchy, and it occurs only here and there in localities where conditions are favourable to its habits. Those conditions commonly are—fairly dense bush or scrub to which to retreat when disturbed, or to lie-up in during the hottest part of the day, 'park-like' tracts or open glades in which to feed, and water within reach. It is nowhere found in anything approaching the numbers that were formerly seen in some parts of south-east Africa, where immense herds were common, and where, as the natives used graphically to express it, the whole bush would sometimes become red with them; neither, so far as I know, does it occur continuously over any wide extent of country. In small parties, or herds, of from ten, twenty, thirty, to forty or perhaps fifty, but rarely, I think, more, it is, however, scattered here and there over the country from within about 50 miles of the coast (as on the edge of the Taru desert), through Masailand to the basin of the Victoria Nyanza on the one hand, and on the other from the banks of the Sabaki and the Tana to the neighbourhood of the Lorogi and Matthews ranges. Its haunts in Central Africa are, for the most part, in almost untrodden wilds, where there is no one to interfere with it; and it is therefore unlikely that it was ever more abundant than at the present day. It is fairly common in the neighbourhood of the Guaso Nyira river, north of Mount Kenia.

"The impalas in this part of Africa generally have wider horns than those from the south; this, so far as I am aware, being the only respect in which they differ from their southern brothers. Their colour often matches so well with certain tree-stems or the ant-heaps common in some parts, that it is easy for an unpractised eye to overlook these antelopes when standing motionless in the bush. I have, however, often wondered whether this 'protective colouring' in such animals is really of any practical value, as no experienced hunter is deceived thereby. As a matter of fact, I have noticed that, although one may at first sight mistake a stump for a buck, the converse error is rarely if ever made.

"When in high condition, the coat is wonderfully sleek and glossy; and a young doe is then less red in colour than usual, being more of a brownish tint, almost approaching mouse-colour.

"The rams fight desperately, and the vanquished form separate herds by themselves. In the rutting-season the rams make a deep-toned sound, which may be best described as a kind of continuous grunting. To those unfamiliar with the habits of these antelopes the noise might readily be believed to be produced by pigs, when heard in thick bush where the animals themselves are hidden.

"As already stated, pala are dependent on water, from which they are never found very far away; but the frequency with which they drink depends very much upon the state of the pasturage. When the latter is very dry the antelope resort to the water at least once in the twenty-four hours, but when feeding on fresh green grass they do not need to drink so often, and at such times wander farther away from the drinking-places. Although feeding principally on grass, they eat leaves as well.

"Palas are most graceful and agile antelopes, and display marvellous activity when alarmed, flying through the scrub and bounding high over bushes, one after another, as the herd follows its leader in its headlong course; or, if surprised at close quarters in thick covert, the bush becomes suddenly alive with them, several being often in the air simultaneously in their first bewildered fright.

"As a rule, they are not hard to stalk, although it is sometimes difficult to get a shot, owing to the thick bush they often frequent. When, however, the hunter has once succeeded in approaching unobserved, he may often, if he wish, kill two or three, one after the other, while occasionally two may even be brought down with one bullet.

"In districts where there are wild dogs, the pala is its favourite prey. One luckless buck is singled out, and, being separated from the herd, is hunted by its relentless pursuers; one dog making the running while the pack follows, until at last the leader runs into the exhausted quarry and bowls it over, when it is torn to pieces and swallowed almost literally alive. Leopards, too, constantly take toll of these antelopes, and the lion is not above appeasing his hunger with one when no larger game is available.

"In East Africa these beautiful antelopes do not seem to mix so much with other species as they are in the habit of doing in the south; but they may sometimes be found in company with bonte-quagga, or, more rarely, giraffe. It is rather a curious circumstance that, whereas in South Africa they constantly associate with blue wildebeest, in this part of the continent these two creatures, so far as my observation goes, keep altogether apart."

THE BLACK-FACED, OR ANGOLA, PALA

(*Æpyceros petersi*)

(PLATE v, fig. 5)

The black-faced pala of Angola differs from the typical representative of the genus (of which, indeed, it may perhaps be merely a local race) by the presence of a purplish-black streak along the middle of the face from the transverse line of the eyes downwards, and also of a similar longitudinal streak on each side of the face passing through the vertical line of the eye. The species, or race, is known only from the Kakao-Veldt and the Mossamedes district of Angola. In habits it appears to be identical with the typical pala.

THE SPRINGBUCK

(*Antidorcas euchore*)

Springbok, CAPE DUTCH; *Tsipi*, BECHUANA; *Itsaypi*, MAKALAKA; *Menya*, WEST AFRICA

(PLATE ix, fig. 1)

With this well-known and graceful species we reach the first representative of the gazelles—a group easy of recognition on account of the peculiar type of face-markings prevalent in most (and in all of the African) species; and also one in which the females are generally furnished with horns.

From ordinary gazelles the springbuck differs, however, by the presence of a deep fold in the skin of the middle of the back, lined with long white bristly hairs, and capable of being partially turned inside-out, when the long hairs, in place of lying flat, are erected so as to form a kind of fan-like crest. It is further distinguished by having only five, instead of the usual six, pairs of cheek-teeth in the lower jaw.

The horns of the bucks are of medium size and lyrate form, curving at first outwards and then inwards with a peculiarly graceful twist, and the tips inclining either directly inwards or inwards and backwards: those of the does are smaller. In height a male springbuck stands about 30 inches, or perhaps rather more; while its weight has been

estimated at from about 70 to 80 lb. The general colour of the upper-parts is bright cinnamon-fawn, with the face, throat, under-parts, inner sides of the limbs, and the long hairs of the dorsal fold and the sides of the tail white. There is, however, a patch of fawn on the crown of the head, a chestnut streak on each side of the face from the eye to the angle of the mouth, and a broad chestnut band defining the fawn of the sides from the white of the belly. The record horn-length is 19 inches.

The haunts of the springbuck are the open plains of southern Africa, on which the range in the central part of the continent extends to about lat. 20° S., where it is bounded by the forests to the south of the Mabibi river. On the east side the species ranges at least as far north as the Limpopo, while on the west it reaches Mossamedes and Benguela in southern Angola.

So much has been written—from the time of Gordon Cumming onwards—concerning the springbuck in South Africa, and especially the countless thousands in which it formerly occurred, that it will be well to take first the following abbreviated account from the pen of Mr. G. W. Penrice of the species in Angola :—

" In Angola the range of the springbuck extends from the mouth of the Quenene river, the southern limit of Portuguese territory, as far north as Benguela, north of which there are none, while there is also not one to be found beyond a thirty-mile range from the sea. This is accounted for by the fact that the veldt alters and becomes unsuited to the habits of these antelopes. Farther south, towards Mossamedes, their range inland is somewhat more extended. In the Benguela springbucks the faint markings are somewhat more defined, and the patch of dark cinnamon-coloured hair between the horns is larger than in the more southern form. The horns vary much in shape, the points of some bending forwards, others inwards, and others again bending backwards almost as much as in the chamois. Springbuck herd together in large and small troops, males and females being found in the same troops all the year round, although single bucks are often met with.

" The springbuck is, in my opinion, as handsome a buck as there is in Africa ; and it is one of the few animals in which the Portuguese have interested themselves sufficiently to give it a name. They call it *cabra de leque* (goat of the fan), on account of the long white fringe of hair that extends along the rump. On occasions the springbuck opens this curious fan-like structure, spreading it out into a broad white patch ; although when lying dormant it is hardly visible.

"Springbuck, when frightened, occasionally give vent to a shrill whistle, although one might hunt them for a whole year without hearing this sound. They drop their young in West Africa towards the end of December and the beginning of January; seldom, if ever, giving birth to more than one fawn at a time. They are very fleet, getting over the ground in the great bounds from which they derive their name; but a trot is also a favourite pace. If hunted with dogs, they become exceedingly wild and difficult to shoot. On the Coroque river, south of Mossamedes, springbuck abound, but it is impossible to approach them much within 500 yards, owing to the fact that in times past the Portuguese and natives of the country hunted them with dogs and killed numbers at a long range. In the Benguela district they are, however, much more tame, and I have often approached on horseback to within 70 or 80 yards of a troop. Firing does not disturb them much; and many a time, when I have made a bad shot, and the bullet has passed over them, they have merely given a jump, walked a few yards, and continued feeding, while sometimes they have only shaken their heads, without moving from the spot at all. They are fond of returning to the same piece of ground to graze, and frequent the sandy plains, where they seem able to exist on very scant herbage. In addition to grazing, they feed a good deal on mimosa-bush. They seldom, if ever, drink, the early morning dews apparently being sufficient for their wants. Unlike their South African relatives, springbuck in the west are very fond of the mountains, and on the top of a range close to and running parallel with the coast they may be found in large numbers. They also seem to like associating with the zebra; and, during the rains, when these animals come near the coast, springbuck and zebra may be seen dotted about on the open plains, feeding together.

"At first springbuck-shooting is by no means easy, and one may fire away a large number of cartridges and not bag a buck. There are various reasons to account for this preliminary failure. Springbuck have long legs, and not very deep bodies; the atmosphere and also the colour of the ground cause the sportsman to fancy that the buck are much closer than they really are; but when these difficulties are got over, and one understands their ways, they are easily shot. Springbuck-shooting, either on foot or on horseback, is a fascinating sport of which I have never tired; the buck may be hunted at any hour of the day, and seem to be always on the feed. At certain seasons springbuck congregate in one vast herd, and 'trek' to some other veldt, where they again disperse into smaller troops. I saw this on one occasion when

riding out in the afternoon I came to a large open plain, simply covered with springbuck to the number of several thousands. Galloping alongside of them, I got off my horse and watched them go past. They kept their line, swerving very little, although I shot three ; but the next day they had all vanished. One never finds springbuck in country where there is high grass ; they seem to like to be able to see all round. During one year of exceptionally heavy rain on the coast, the grass grew very long, which resulted in all the buck 'trekking' farther south to a more sandy veldt."

Up to about the middle of the nineteenth century springbuck in South Africa existed in countless thousands—not to say millions—and

FIG. 51.—Springbuck in Mr. Rudd's park at Fernwood, Newlands, near Cape Town.

the *trek-bokken*, as their periodical migrations were termed, formed a source of anxiety to the Boer farmers. These *treks* were caused by droughts in certain districts, which compelled the buck to seek fresh pastures. Such migrations in the Great Karoo district of Cape Colony have, however, been things of the past for more than half a century. On the other hand, an enormous *trek* took place in Namaqualand and the adjacent part of Cape Colony so late as 1892 ; the number of buck being so great that arms were issued by Government to the farmers to help them destroy the invaders and thus save their crops.

In the Karoo springbuck seem to be generally independent of water, but in Little Namaqualand they have been known to cross a mountain-range separating their normal haunts from the sea, and on reaching

the ocean to rush madly in and greedily drink salt water—naturally with fatal effect. On the occasion referred to, it is stated on trustworthy authority that for a distance of more than thirty miles the shore was literally piled with the carcases of defunct springbuck.

When a springbuck indulges in the leaps or bounds from which it takes its name, the long slender legs are quite stiff and rigid, while the hoofs strike the ground simultaneously at the conclusion. The leap is frequently from 8 to 10 feet in height, and may be repeated at least half-a-dozen times in succession, after which the creature speeds away like an arrow from a bow. During the leap the white "fan" is erected and expanded.

Formerly springbuck-shooting was an excellent and easily obtained sport; but the enclosure of a great part of the country with wire fencing has rendered this kind of shooting different from what it was, although before the late war there were vast numbers of buck on some of the farms. Among the districts where springbuck were recently to be met with in considerable numbers (as they probably are at the present day) may be mentioned Ngamiland and the northern part of the Kalahari Desert, where the numerous salt-licks on the plains bordering the Botletli river formed favourite resorts.

Owing to the open character of these plains it is, however, difficult to get within less than three hundred yards of the game, and a springbuck at that distance offers a comparatively small mark. By the aid of a stalking-horse a much nearer approach can be made; while sometimes the same end can be effected by the aid of grazing oxen.

THE DORCAS GAZELLE

(*Gazella dorcas*)

Rhozal OR *Hemar*, ALGERIAN ARABIC; *Ghasala*, SYRIAN ARABIC

(PLATE ix, figs. 2 and 3)

The elegant antelopes commonly styled (from an Arabic name of the present and typical species) gazelles are so well known and so generally similar to one another, that they are one of the easiest groups to recognise. Lacking a fold of skin in the back, and with six pairs of lower cheek-teeth, they have a neck of average length, and horns (in the African species common to both sexes) with the basal three-fourths of their length convex in front. Generally the colour is sandy above and white below, and in all the African species

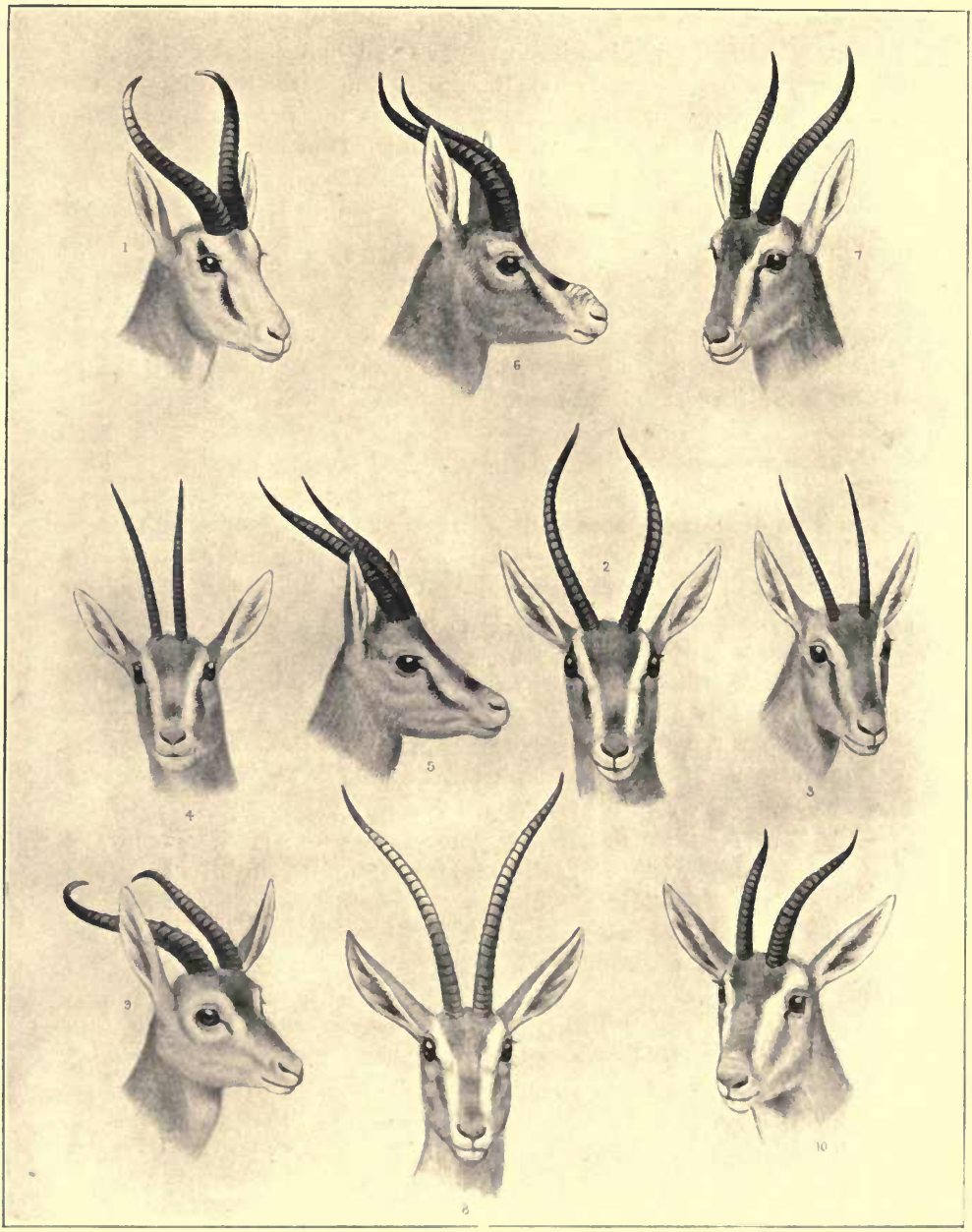


PLATE IX

1. Springbuck.
2. Dorcas Gazelle (male).
3. Dorcas Gazelle (female).
4. Edmi Gazelle (female).
5. Edmi Gazelle (male).
6. Speke's Gazelle.
7. Pelzeln's Gazelle.
8. Loder's Gazelle.
9. Black-tailed Gazelle.
10. Rufous Gazelle.

the face is marked with longitudinal dark and light streaks. Tufts of hair are usually developed on the knees; and the tail in all the African species is of medium length. Glands are present on the face, and corresponding depressions for their reception in the skull below the sockets of the eyes in all the African representatives of the group. In the bucks the horns are stout, boldly ridged, and in most cases, though not all, not much longer than the head, the tips being generally more or less curved forwards or outwards, but occasionally inwards. In the does they are shorter, straighter, more slender, and display less constancy of form in the individual species. Gazelles which are common to a large portion of Asia and the more open districts of Africa, include a large number of species, of which the majority are African.

The dorcas, or typical, gazelle, which is one of the smallest representatives of the whole group, standing less than a couple of feet at the shoulder, agrees with a large number of other species in that the white of the rump does not extend on to the back, in the indistinctness of the dark band on the flanks which separates the fawn-area above from the white below, and likewise by the perfectly lyrate horns, which are of medium length, with the middle portion twisted outwardly and the tips converging. In the present species the shoulder-height is about 21 or 22 inches; and the general colour of the upper-parts pale fawn of rather variable tint, with the face-markings distinct, but no dark spot on the nose. The tail is, as usual, black above. The record horn-length is $13\frac{3}{8}$ inches.

A native of the plains in the wilder parts of Algeria, Tunis, and Tripoli, this gazelle ranges eastward into Egypt, Syria, Palestine, and certain parts of Asia Minor, while to the southward its range extends into Nigeria and the eastern Sudan. The habits of the species are the same as these of gazelles generally; but it may be noted that the dorcas prefers open country sparsely covered with scrubby vegetation to the arid desert itself, where indeed it would probably starve. In Tunisia, although they are sometimes shot from horseback, these gazelles are more generally coursed with greyhounds.

The function of the tufts of long hairs on the knees of gazelles (as well as of some others of the smaller antelopes) is apparently to act as pads to protect the knees when in the kneeling posture—an attitude frequently adopted by these antelopes when grazing. It is, however, noteworthy that they correspond to some extent in position with the tufts of long hairs growing on the leg-glands of most deer.

THE EDMI OR ATLAS GAZELLE

(*Gazella cuvieri*)

Edmi OR *Admi*, ARABIC, IN ALGERIA; *Edem* IN TUNISIA

(PLATE ix, figs. 4 and 5)

Although its range includes a portion of the country coming within the distributional area of the dorcas, namely Morocco, Algeria, and western Tunisia, the edmi is never found in association with the latter. On the contrary, while the dorcas is a dweller on the plains, the edmi is essentially a mountaineer, and has been obtained at an elevation of between 6000 and 7000 feet on the Algerian border of Tunisia. It is said, indeed, to be as good a cragsman as the chamois; and may often be found amid the juniper-forests on the slopes of the Atlas.

From the dorcas the present species is readily distinguished by its superior stature (26 to 27 inches at the shoulder), the imperfectly lyrate form of the horns, which diverge more or less regularly upwards, the presence of a black spot on the top of the muzzle, and the rough character of the hair, which is also more fulvous in colour. The general colour of the upper-parts is dull fawn, with an indistinct dark flank-band, well-defined face-markings, a black crest on the terminal portion of the tail, and the under-parts, buttocks, and inner surfaces of the fore-legs white. The record horn-length is $14\frac{7}{8}$ inches.

In Asia the edmi is represented by the rather smaller Merrill's gazelle (*Gazella merrilli*, or *G. gazella*) of Palestine, by the Arabian gazelle (*G. arabica*), and by the saikik gazelle (*G. yarcandensis*), typically from Yarkand, but represented by a race (*G. y. kennioni*) in eastern Persia and Afghanistan which is the largest of all.

SPEKE'S GAZELLE

(*Gazella spekei*)

Dhero, SOMALI

(PLATE ix, fig. 6)

The East African representative of the edmi appears to be Speke's gazelle of the high plateau of Somaliland, ranging from the Golis

mountains southwards to Ogoden, but also occurring to the northward of the Golis in the neighbourhood of Laferug, where it impinges on the habitat of the next species. With horns of much the same type as those of the edmi, the dhero, as this species is called in Somaliland, is distinguishable at a glance by the presence of a flabby, corrugated swelling on the nose, which is present in both sexes, although more developed in the male, and probably connected with the sexual function. The general colour of the upper-parts is pale brownish fawn, with the flank-band darker than in the other members of the edmi group, and a black nose-spot. The shoulder-height is from 23 to 24 inches, or only slightly more than in the dorcas; and the record horn-length 12½ inches.

In life the loose flabby skin of the hump on the nose can probably be inflated.

The following account of Speke's gazelle in its native home is by Mr. D. G. Elliot: "In its habits it resembles Pelzeln's gazelle, and frequents the same kind of country—bare stony stretches with bunches of stunted wiry grass scattered here and there—and is very seldom met with among bushes or trees of any size, although I have known it go into fairly dense clumps of jungle. I believe, however, on these occasions it sought such retreats as places of refuge more from necessity than from choice.

"It is a rather shy animal, more so, I think, than the lowland species, and is at times very wild and difficult to approach, compelling the hunter to take long and hazardous chances in order to secure a specimen. It is a very watchful creature, each individual of a band adding its own powers of discovering danger to that of the entire company. When any unusual object is perceived, the whole troop stop and watch it intently; for these gazelles have a large amount of inquisitiveness, and will frequently stand motionless and gaze a long time before commencing to run. When first startled they only go a short distance, and if the cause of their fears has disappeared they will begin to feed or play with each other, the males engaging in mock battles, or chasing each other with great speed; but if much persecuted they will abandon a locality altogether.

"The horns of the male are stouter and more curved than those of Pelzeln's gazelle, but, like these, are annulated nearly to the tip. Those of the female are lighter, straighter, less deeply annulated, and measure about 9 inches. Speke's gazelle is a stouter animal than the lowland species, with a much thicker coat, in accordance with the colder climate of the high plateau."

PELZELN'S GAZELLE

(*Gazella pelzelni*)

Dhero, SOMALI

(PLATE ix, fig. 7)

The lowlands of the Guban district of northern Somaliland form the home of a gazelle slightly larger than the plateau species (about 25 inches at the shoulder), and further distinguished by the absence of both the swelling and the black spot on the nose. Its colour is also rather more rufous than that of Speke's gazelle, while the light flank-band is distinct, and the dark one rufous brown, only slightly deeper in tone than the back, and without any tendency to blackness. The bands on the cheek are short and indistinct. The southern limit of the species seems to be Laferug, north of the Golis range.

"Pelzeln's gazelle," writes Mr. D. G. Elliot, "is usually met with on dry and stony ground covered with low bushes, in such forbidding, sterile country that it is difficult to imagine where, or in what manner, it can obtain sufficient nourishment from the barren desert-like places it selects for its habitation. It goes in small bands consisting of from two or three to about a dozen head; and when a single individual is encountered it is usually an old buck. Eleven is the greatest number I ever met with in one troop.

"As a rule, Pelzeln's gazelle is not very wild, and one can generally approach either single individuals or a scattered party sufficiently near to make sure of a shot; but, like all wild animals, where it is much hunted it becomes wary and watchful. When a buck is seen alone, it is not very difficult to make a successful stalk and approach closely; for, deprived of the companionship of the more watchful doe, he is less alert to probable dangers.

"This gazelle possesses much curiosity, the inclination to indulge in which often costs its life, for, in the desire to ascertain what some strange object may be, it delays its departure to a safer locality until too late. It seems indifferent as to the presence of water, which is absent from many localities inhabited by this gazelle. In the brief rainy season, when showers are of daily occurrence, pools, it is true, are formed in the cavities of the rocks, or in hardened places in the soil, from which water can be obtained, perhaps, many days in

succession ; but in the dry season the gazelles must go sometimes for long intervals before they can find an opportunity of drinking. The dews sometimes are very heavy, and perhaps the moisture obtained from the grass in the early morning is sufficient for their needs. The horns of the male are rather straight, and annulated nearly to the tips, which are inclined to turn slightly forward ; while those of the female are straighter and more slender. The average length of the male's horns would be about 11 inches along the curve ; that of the female possibly 7 inches. In colour there is considerable variation among individuals. The typical style has a broad, conspicuous chestnut-band running lengthwise on the body just above the white of the belly ; but certain individuals, evidently of equal age and of the same sex, taken at the same time and place, and in the same condition of coat, were entirely without this distinguishing mark. It is difficult to account for this, unless it be individual variation, as the specimens were not confined to any especial locality ; neither was it due to difference of age, as fully adult animals were destitute of the stripe ; and, as already stated, it was not confined to one sex. Pelzeln's gazelle is a handsome graceful creature, very fleet of foot, and an ornament to any locality where it dwells ; but its flesh has little flavour, is not often tender, and is always destitute of fat."

THE RHIM OR LODER'S GAZELLE

(*Gazella leptoceros*)

Rhim, ARABIC, IN ALGERIA ; *Ghazal abiad*, IN TUNISIA AND EGYPT

(PLATE ix, fig. 8)

The name by which this species is generally known savours somewhat of false pretences ; for this gazelle was named so long ago as 1842, and was only rediscovered by Sir E. G. Loder in the latter part of the same century. The Arabic title rhim is therefore certainly a better designation. In connection with this it may be mentioned that an animal referred to in the Hebrew text of the Bible as the rhim appears in all probability to be the extinct aurochs or wild ox. If this be so, the transference of the name rhim to a gazelle is precisely analogous to the adoption of aurochs as the designation of the bison.

From all the species hitherto mentioned the rhim is at once distinguished by the great length, slenderness, and comparative

straightness of the horns, of which the record length is 15⅞ inches. In height the bucks stand about 28 inches at the shoulder, or slightly more than the edmi. The colour of the upper-parts is unusually light (a feature indicated by the Arabic name *ghazal abiad*, i.e. white gazelle), and may be described as pale sandy fawn, with the distinctive gazelle-markings very faintly indicated. On the face, for instance, the dark streaks are sandy instead of rufous, while the light band on the flank is almost imperceptible, and the dark one below pale sandy with the merest suspicion of a brown tinge. The tail is sandy at the base, and gradually darkens to brownish black towards the tip; and the ears are nearly white.

Compared with the rich-coloured dorcas, the rhim has been appropriately described as a washed-out species.

The sandy plains of the interior of Algeria, Tunisia, and western Egypt, and thence southwards into Nubia and Sennar, form the habitat of the rhim, whose mode of life is doubtless similar to that of gazelles in general.

The name of *Gazella leptoceros abu-harah*, Heuglin, is available for the rhim of the Libyan desert in the neighbourhood of Lake Natron, if it prove to be distinct from the typical representative of the species.

THE GENAI OR ISABELLE GAZELLE

(*Gazella isabella*)

Genai, TRIBES OF RED SEA LITTORAL

Like the King's cream-coloured state horses, this gazelle takes its name of isabelle from its colour, which is of the normal gazelline type. From all the foregoing species the isabelle gazelle is readily distinguished by the sharp inward bending of the tips of the horns, which form decided hooks, with their main axis almost at right angles to that of the basal portion. In this respect it is practically a miniature of Sömmerring's gazelle. The shoulder-height is about the same as in Pelzeln's gazelle, that is to say about 25 inches; while the maximum recorded horn-length is only 10¾ inches. The colour of the whole of the upper-parts is very pale fawn or sandy; the dark flank-band, as well as the face-markings, being merely a somewhat deeper shade of fawn.

This paleness of tone distinguishes the species from its near ally

the Muscat gazelle (*Gazella muscatensis*) of southern Arabia, in which the general colour is much darker and the flank-band brown.

The habitat of the isabelle gazelle comprises the Red Sea littoral from Suakin to Massowa, and the interior to Bogosland, Barla, and Taka.

HEUGLIN'S GAZELLE

(*Gazella tilonura*)

Tel-Badu, TIGRI

With the tips of the horns of the bucks sharply hooked inwards, as in the isabelle gazelle, this species is distinguished by the strongly defined black flank-band and almost wholly black tail, as well as by a certain superiority in the matter of size. The general colour of the upper-parts is deep sandy, with the central face-streak only slightly darker than the back, and the tail sandy at the root but elsewhere black; a dark nose-spot being absent. The shoulder-height is about 27 inches, and the record horn-length 11¾ inches.

Bogosland, Abyssinia, and Sennar mark the limits of the range of this species, which inhabits elevated and more or less bush-covered plains between 3000 and 5000 feet above sea-level.

THE RED-FRONTED GAZELLE

(*Gazella rufifrons*)

El Hamra, DINKA; *Seni*, GAMBIA

In its typical western form this medium-sized and rather stoutly built species resembles Heuglin's gazelle in having a narrow dark brown flank-stripe, but differs by its much more rufous or chestnut colouring, and the absence of a marked inward hooking of the horns of the bucks. The general colour is rich sandy rufous, brightening into rich rufous on the forehead and muzzle, and without a distinct dark nose-spot. The white face-streaks are well defined, and the dark face-stripes rufous; while the light flank-band is broad and of about the same sandy buff colour as the shoulders, and sharply defined from the rufous of the back. The narrow dark brown band is

separated from the white of the under-parts by a narrow streak of sandy, thereby presenting a marked contrast to *Gazella thomsoni*. Except on the upper part of the base, where it is sandy, the tail is blackish; and, unlike most gazelles, the species has no tufts of long hair at the knees. The horns are relatively small, regularly divergent, curving at first slightly backwards and then forwards, and heavily ridged till the terminal two or three inches. The shoulder-height is about 25 inches, and the record horn-length 11 in the western and $13\frac{7}{8}$ in the eastern race. Specimens of the former frequently show a mixture of white hairs with the rufous between the horns.

FIG. 52.—Head of Red-fronted Gazelle.

Typically a native of Senegal and Gambia, the species apparently occurs under the same form in Nigeria and Lake Tchad, but farther east is represented by distinct races, which have been described as separate species.

The first of these is the Kordofan race (*G. r. salmi*), named on the evidence of heads from Fashoda by Dr. von Lorenz in the *Sitzungs-Berichte* of the Vienna Academy for 1906, p. 28. It appears to be a paler-coloured animal than the typical form, with a smaller area of white on the face, a broader dark flank-band, and the horns larger and more incurved at the tips.

Its range includes Kordofan, El Obeid, and other parts of the eastern Sudan, extending eastwards to the Blue Nile and the Dinder river.

Dr. Lorenz's original description of his *G. salmi* is as follows:—

"General colour pale yellowish brown. The somewhat elongated hair of the forehead, crown, nose, and back of the neck, as also a patch on the cheeks, rufous fawn. Region round the eye and a streak

extending thence towards, but not reaching, the nose, and not sharply defined, whitish. Upper lip isabelle-fawn on the sides, whitish in front; lower lip, chin, and throat, also whitish. Ears pale fawn on the back, becoming whitish at the base on the sides; the inner side, margin, and tip with long white hairs. Horns of bucks, when seen in profile, generally similar to those of *G. thomsoni*; in a front view the upper portion more or less distinctly lyrate, with the tips inclined strongly inwards and slightly forwards. Horns of does very slender, like those of *cuvieri* and *isabella*, diverging at the tips, with slight but distinct rings."

FIG. 53.—Head of Mongola Red-fronted Gazelle.

Lastly we have the Mongola race, distinguished by the colour and form of the face-markings, as well as by the characters of the horns. It may be known as *G. r. albonota*, although it was originally described as a distinct species, on the evidence of specimens from the east bank of the White Nile near Kiri, by the Hon. Walter Rothschild in *Novitates Zoologicæ*, vol. x. p. 480, 1903, as follows:—

Differs from *G. rufifrons* in having the nose and lower half of the central face-stripe black, with a slight mixture of rufous hairs, instead of bright rufous sandy. Face-stripe from eye to nostril white instead of buff. Area between tear-duct and lips dark buff, strongly mixed and shaded with black, instead of pale buffy rufous. Head and neck pale isabelline, instead of rufous buff. Upper half of face and forehead pale rufous mixed with white, almost entirely white between the horns. Horns wider spread and more recurved backwards than in *rufifrons*, the points more turned inwards, and the rings deeper cut and more conspicuous.

This race inhabits the Mongola district or province, on the

Abyssinian side of the Bahr-el-Gebel, ranging from Gondokoro in Uganda to Bor in the Sudan.

THE RUFOUS GAZELLE

(*Gazella rufina*)

(PLATE ix, fig. 10)

This gazelle was described by Mr. O. Thomas in the *Proceedings* of the Zoological Society for 1894, p. 468, on the evidence of a flat skin purchased by Sir E. G. Loder in Algiers, which appears to be the only known specimen.

It is described as very similar in colouring to *rufifrons*, but of much larger size (shoulder-height about 30 inches), with the light streaks on the face indistinct, and with a heavier skull and stouter hoofs. Possibly it is only a race of *rufifrons*.

The general colour of the coat is bright rich rufous above, with the central face-streak especially rich, approaching chestnut, but the light streaks on each side of it only slightly paler than the general body-colour, and thus markedly different from those of most other species. The crown of the head, cheeks, and sides of the neck are pale rufous. The dark flank-band, although less than a couple of inches in depth, is well defined and nearly black; the light band is equally distinct from the dark rufous of the back, being about the same colour as the neck; but the dark border to the rump-patch is but slightly developed. The tail is rufous at the base, with a black tip. As in *rufifrons*, distinct knee-tufts are lacking. The hoofs are twice the bulk of those of *rufifrons*; and the horns are relatively short, and ringed for two-thirds their length, with the tips bent inwards.

THOMSON'S GAZELLE

(*Gazella thomsoni*)

Swalla, SWAHILI; *Engoli*, MASAI

(PLATE x, fig. 1)

Although not larger than *tilonura* (from about 25 to 27 inches at the shoulder), Thomson's gazelle, on account of the long horns of the bucks, and the broad black flank-band of both sexes, is one of the handsomest members of the whole group. The horns are of the

general type of those of *rufifrons*, but longer; while the face-markings are less rufous; there is a well-defined black nose-spot; and the wholly black flank-band is of great depth, and in immediate contact with the white of the under-parts. The general colour of the upper-parts is deep sandy rufous, with all the markings well defined; the central face-streak being a deeper rufous, and the light flank-band present, although only slightly paler than the back, while there is a narrow black band defining the white of the rump from the rufous area of the back. The average weight is about 55 lb., and the record horn-length $15\frac{3}{4}$ or 16 inches.

The high open plains of Masailand are the chief haunts of this elegant little gazelle, whose range includes the interior of British and German East Africa from Lake Rudolf southwards to Irangi. The Laikipia plateau is a well-known haunt; where, as in other places, the species is often found in company with Grant's gazelle.

Mr. A. H. Neumann writes:—

"I have not found this gazelle difficult to approach. This is perhaps because it inhabits country where the natives do not, as a rule, molest the game, for it is not the custom of the Masai to eat the meat of wild animals. I have, however, not killed many myself, having preferred to devote my attention to bigger beasts when seeking to provide meat for a large caravan while passing through its habitat. On one occasion, however, when we were in urgent need of food and no other game was procurable close by, I shot several single males that were scattered about, each by itself (as is the habit of the very old rams), in the perfectly bare plains south of Naivasha, without any trouble, by simply walking after them."

GRANT'S GAZELLE

(*Gazella granti*)

Suara, SWAHILI; *Ngoli*, NODOROBO; *Hidi*, GALLA

(PLATE X, figs. 2 and 3)

With this large and handsome species we come to a group of gazelles distinguished not only by their tall stature but likewise by the circumstance that the white of the rump intrudes to a greater or less degree on to the fawn-coloured area of the sides of the back. In the present species the long and slender horns of the bucks are typically distinctly lyrate in form and ridged nearly to their summit;

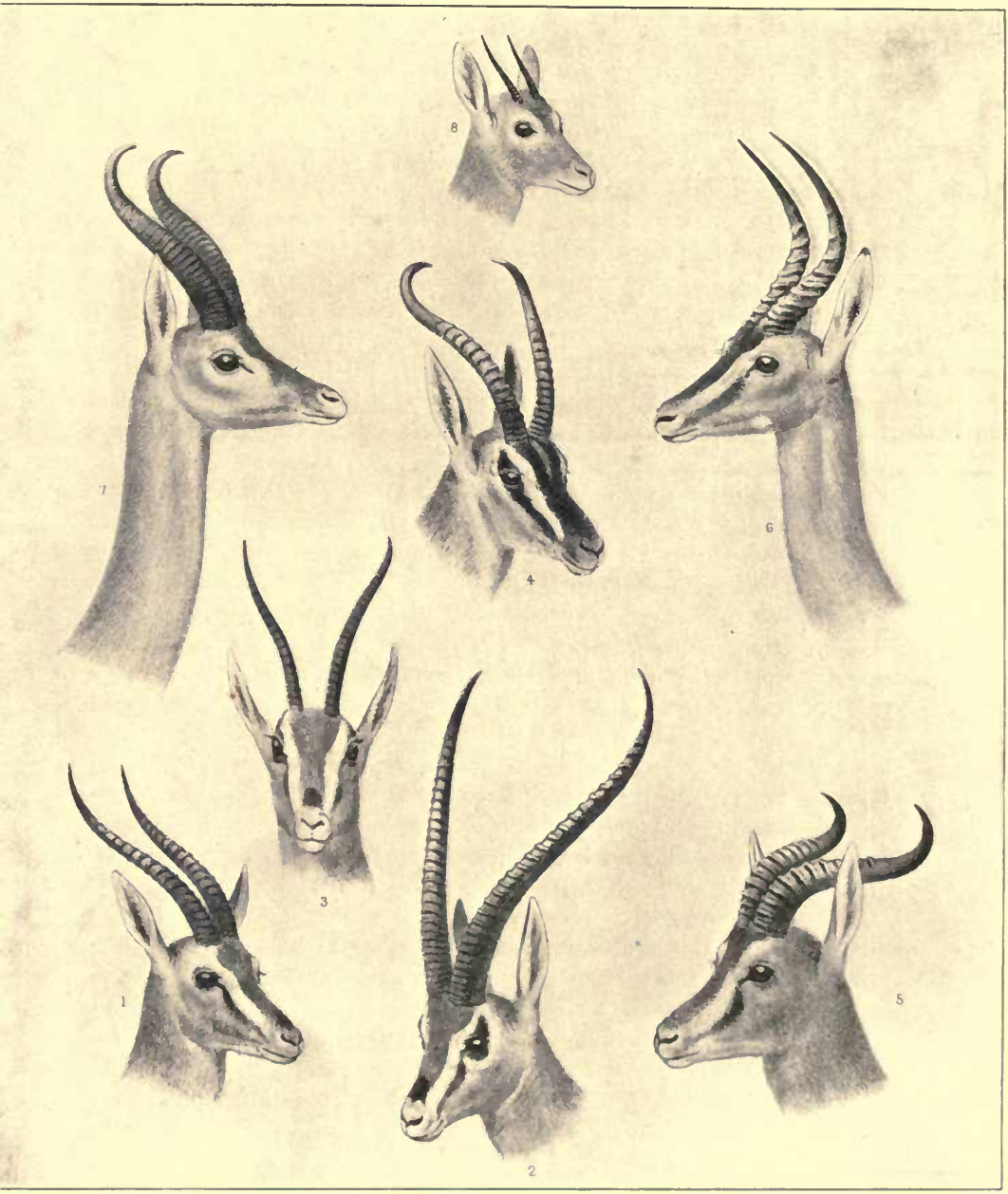


PLATE X

1. Thomson's Gazelle.
2. Grant's Gazelle (male).
3. Grant's Gazelle (female).
4. Sömmerring's Gazelle.
5. Mohr Gazelle.
6. Dibatag.
7. Gerenuk.
8. Beira.

the white rump-patch, which only intrudes to a small extent into the fawn-area, is bordered in front on each side by a narrow black line; the streak down the middle of the face is chestnut with a black nose-spot; and, with the exception of the black crest, the tail is either wholly white or fawn above and white below. Typically, at any rate, the hair of the neck and back has a peculiar wavy appearance, recalling that of watered silk or silk-brocade. The shoulder-height ranges from about 32 to 34 inches; and the weight of bucks of the typical race from about 150 to 165 lb. The record horn-length is $30\frac{1}{4}$ inches.

This species has an extensive range in East Africa, and is represented by the following local races, of which the distribution is given by Mr. Oscar Neumann in the *Sitzungs-Berichte Ges. Naturfor. Berlin* for 1906, pp. 241-244.

In the typical race (*Gazella granti typica*), whose range includes the interior of German and British East Africa, from northern Uhehi northwards to Mount Kenia, the white rump-patch includes practically the whole of the tail, only a short spur of the fawn of the back extending on to its base, and the lateral bands are faint.

The Usukuma race (*G. g. robertsi*), described by Mr. O. Thomas on p. 119 of the Zoological Society's *Proceedings* for 1903, vol. ii., is typically from German East Africa, its range extending from Usukuma and the district at the south-east angle of the Victoria Nyanza northwards to Mara, and eastwards to Nasseria and Loita. In colour it resembles the typical race, but the horns of the bucks, and in a less degree those of the does, are completely twisted round inwards, so that their tips are directed backwards and outwards so as to be very widely sundered, thus producing a somewhat goat-like appearance.

In the Tana race (*G. g. petersi*), from the Tana and lower Sabaki valleys, originally described by Dr. A. Günther in 1884 as a distinct species, the stature is relatively small (32 to 33 inches); the fawn of the back is continued all along the upper surface of the base of the tail, so as to divide the white rump-patch into two halves. The horns are nearly straight. The Loroghi race (*G. g. notata*), from the highlands southwards and south-eastwards of Lake Rudolf to the Guaso-Nyiro valley and Mount Kenia, was described by Mr. O. Thomas in the *Annals and Magazine of Natural History* for 1897, ser. 6, vol. xx. p. 479. It is stated to be distinguished from the typical race by the greater length, depth, and colour-intensity of both the dark and the light flank-bands; the former being black, the latter dark buff, edged above posteriorly with a second dark band, less deep in tone than the

main flank-band, but decidedly darker than the middle line of the back. The dark band to the white rump-patch is also broader, and deep black in colour. The horns are nearly straight, as in *petersi*. The type specimen was killed in the Loroghi Mountains of British East Africa.

The Lado race (*G. g. brighti*), named by Mr. O. Thomas, on the evidence of specimens from the district between Lado and Lake Rudolf, on page 805 of the *Proceedings* of the Zoological Society for 1900, is a rather small form, of very pale colour, with no dark lateral bands. The white of the rump-patch intrudes deeply into the fawn of the back, so as to completely surround the tail; the dark band to this patch being short, narrow, and in some cases well-nigh obsolete. The horns are relatively short, with the immature boss on the front of the base retained in the adult, and covered with a distinct tuft of hair. This race inhabits the district between Lake Rudolf and the Nile.

Lastly, we have the Abaya race (*G. g. lacuum*), from the neighbourhood of Lake Abaya, named by Mr. O. Neumann in the paper already cited, which is characterised as follows:—In size this race is inferior to the typical form, with the horns nearly straight, as in *petersi* and *notata*. The general colouring is similar to *typica*, but the white rump-patch is smaller, with no trace of any intrusion of the fawn-area in the region of the tail, and the dark border to the rump-patch fainter and less defined. The dark flank-band, although distinct in the young, becomes nearly obsolete in the adult; this character, together with the long straight horns, distinguishing this race from *brighti*.

Some at least of these races are known to intergrade. The following account of the typical race is abbreviated, and otherwise slightly modified, from one furnished by Mr. A. H. Neumann:—

"Grant's gazelle is not, so far as I know, found anywhere within at least 150 miles of the sea (in the coast-belt its place being taken by the somewhat smaller race *petersi*); but in the interior, except in densely bushed or rankly grassed areas, on high mountains, or, of course, where the land is much cultivated and thickly peopled, one can hardly ever travel a day without seeing at least a few specimens of this ubiquitous species. Alike in bushy wildernesses and treeless wastes, on level plains and stony hills, even the most rugged—as at the southern end of Lake Rudolf, where there is little but bare rock—Grant's gazelle is at home; but in the open country it finds its most congenial habitat, and there it is most numerous.

"It is often seen in company with zebra, oryx, or (in their own districts) Coke's hartebeest, or topi, and not infrequently with giraffe;

and when the latter animals are being stalked it is apt to be in the way. Especially is this so in the case of the last-named; for the gazelle seem sometimes to act as outposts for those wary beasts, spying under the bushes while they look over.

"The size of the herds varies from comparatively few to twenty, thirty, or even about fifty individuals; but in specially favourable localities, such as the plains of Masailand or the high open plateau of the Ongata Barta, south of Mount Nyiro, they may be much larger, as many as a couple of hundred head being sometimes seen together. The following of each master-buck usually consists of from half-a-dozen to a dozen does; and such little parties are often seen separately, the buck resenting any other male intrusion except immature bucks. The larger herds are composed of any number of such families which have united their forces, and consequently contain many bucks. These do not, however, appear to fight when meeting, except if the ownership of the harem specially appertaining to each be disputed; and should the herd break up, it is resolved into its component parts, each patriarch taking charge of his particular wives. There are, of course, many vanquished bachelors, which, as is the custom with most animals under such circumstances, associate in separate herds.

"Grant's gazelle is one of those antelopes which eat both grass and leaves; and a wild fruit or berry borne by a plant common in some parts, to which the large pauw (bustard) is also partial, is frequently among the contents of its stomach. Although it may be seen far from water, it does not appear to be entirely independent of that element. That it certainly drinks I can testify from experience, and it seems generally more numerous where water is obtainable in the vicinity. Probably, however, its needs in this respect, as is the case with certain other antelopes, depend to a great extent on the character of the herbage on which it is subsisting.

"Near Lake Rudolf the does seem to drop their fawns about April; but the breeding-season varies in different districts, and I have met with young fawns in September a little farther south, and near Machakos I saw them in January, while Mr. T. E. Buckley told me that in the Kilimanjaro country the does begin to drop their fawns about the end of February. Where there is little difference between the seasons, as is the case under the equator, animals are, however, not very regular in their times of breeding. The newly-born fawns are left lying alone, as with other antelopes; and while they are very young the mothers often feed apart from the herd near the spot where their young are concealed.

"The only sound I have heard this gazelle utter is a kind of goat-like sneeze, which is its cry of alarm. When in good condition the meat of Grant's gazelle is excellent, and as the species is generally distributed, it is a great stand-by for supplying the larder.

"As a rule these gazelles are not difficult game to get within shot of, so that one or two may generally be procured when needed. In the open, however, where there is no possibility of stalking, they are sometimes very tantalising, having a habit of trotting languidly on, just as the hunter is getting within convenient range; the horns of the

FIG. 54.—Grant's Gazelles near Mount Marsabit to the south-east of Lake Rudolf, from a photograph by Lord Delamere.

rams bobbing up and down over their backs as they nod their heads lazily in time with their action, as if it were too much trouble to hold them steady. Then, when they have increased the distance between them and their pursuer, they again slacken their pace to a walk, still keeping only their white sterns towards him, till he once more gains on them, and so on. A plan which sometimes succeeds under such circumstances is, instead of following, to walk round them in a semi-circle as if going past, but gradually edging nearer, when they are more likely to stand and allow of a shot, than if followed directly. These tactics are, however, better commenced from some distance, as, of course, the sportsman must not get to windward of the game. It not

unfrequently happens that when one of the bucks has been killed, the other members of the party will stand and allow a second shot. In some cases, if the hunter sits down and waits patiently as near as he can conveniently get without frightening the game, they will come gradually towards him in an inquisitive manner."

THE AOUL OR SÖMMERRING'S GAZELLE

(*Gazella soemmerringi*)

Aoul, SOMALI ; *Maédado*, DANIKIL ; *Meidafiel*, ABYSSINIAN ; *Ariel*, SUDANI

(PLATE x, fig. 4)

Sömmerring's gazelle, which is also an eastern species, has a more northerly range than the last (which it slightly exceeds in stature), being specially common, at least in former years, in Somaliland. From *granti* it is distinguished by the greater intrusion of the white of the rump-patch into the fawn-area and the general absence of a black border to the former, the sharply defined and nearly black band down the middle of the face, and the inward hook-like bend of the tips of the horns of the bucks, which are shorter and more massive than in the allied species. There is no distinct dark flank-band ; the tail, except for the black crest, is wholly white ; and the ears are tipped with black. The colour is in general more sandy and less rufous than that of Grant's gazelle.

The range of this species includes the Abyssinian Red Sea littoral, Berber, eastern Sennar, Danakil, Bora Gallaland, and Somaliland ; these gazelles occurring in the last-named country all over the Haud plateau, as well as Ogoden.

The typical race (*Gazella soemmerringi typica*), from the neighbourhood of Berber and Suakin and the adjacent districts, has the characters given above as those of the species.

The North Somali representative of the species (*G. s. berberana*) was separated by Dr. P. Matschie in the *Sitzungs-Berichte Ges. Naturfor. Berlin* for 1893, p. 65, on account of its superior stature, darker colouring, and differently curved horns. According, however, to Mr. Oscar Neumann, *op. cit.* 1906, p. 240, the difference in colour was due to the comparison of specimens killed at different times of the year ; so that the difference in stature and horn-curvature appear to be the only distinctive features of the northern race.

A third race, from Bora Gallaland, is described by Mr. O. Thomas in the Zoological Society's *Proceedings* for 1904, vol. i. p. 4, as *G. s. butteri*. It is smaller than the typical *soemmerringi*, with a distinct black band on the front edge of each side of the rump-patch, and a faint trace of a dark flank-band.

A remarkable abnormality in the curvature of the horns is shown in a head of Sömmerring's gazelle from Somaliland belonging to Mr. H. C. Dobbs. The head, which was figured in the *Field* newspaper for 1907, is that of a fully adult buck, with both horns symmetrically shaped. In place, however, of diverging obliquely outwards for the greater part of their length, and then suddenly bending inwards near their tips in the normal fashion, the horns are distinctly lyre-shaped, with their tips curving outwards. The variation is a striking one, and the general curvature of the horns decidedly handsome.

FIG. 55.—Skull and Horns of Sömmerring's Gazelle, from a specimen shot by Col. V. M. Stockley.

The following notes on the habits of this gazelle are from the pen of Mr. D. G. Elliot :—

"The physical characters of the country do not seem to make any difference to this gazelle, which is found in parts thickly covered with trees and bushes, or on plains entirely destitute of timber; but if any preference is given, I think it is to the plains, for the herds congregated in such localities are much larger than elsewhere, sometimes containing many hundred individuals. The species cannot, however, be deemed a denizen of the plains in the same sense as oryx and hartebeest, with which the aoul is accustomed to associate on most friendly terms.

"Sömmerring's gazelle is not a graceful animal, having a short neck, rather clumsy head, and a heavy body; its general appearance being very different from that generally associated with the light-footed gazelle. Of its speed there can, however, be no question, as it is very fleet, and when running has the habit of jumping to a considerable height and for long distances, not unlike the springbuck. Naturally this is not a very wild species, nor particularly suspicious, although in districts where it is much hunted it becomes very wary.

"Apparently, like many animals in Somaliland, this gazelle is independent of water, for in that thirsty land little of the fluid is obtainable, and the aoul is frequently met with many miles from any place where an opportunity for allaying thirst is offered. The entire country is so dry that all wild animals inhabiting it must have great difficulty in procuring water; and, with the exception of pools in the brief rainy season, a supply can only be obtained by digging in the dry beds of the rivers, a proceeding entirely beyond the power of a ruminant. As a rule, the aoul is easy to approach within shooting distance, that is, between one and two hundred yards, though sometimes it may be necessary to shoot farther than this. When the animal is among bushes, it is comparatively easy to get quite near, if the stalk is made with knowledge and judgment. Aoul can be distinguished for a long distance, the large white patch on the hind-quarters showing very distinctly, and rendering them easily distinguishable from the other animals with which they may be associated.

"This gazelle is possessed of great curiosity, and when it perceives any unusual object, will stand motionless for a considerable time gazing at it; while even after its fears have gained the ascendancy, and it has commenced to run, it will, after going a short distance, stop and turn to look again at the cause of its alarm. Although large for a gazelle, the aoul presents but a small mark, and unless the bullet strikes a vital spot, it will probably escape. Even a broken leg does not appear to incommode it much, nor hinder it from running at full speed on the three that are sound.

"In Somaliland the females apparently drop their fawns in April, for in June, when I arrived south of the Haud beyond the Toyo plain, many were seen that seemed from four to eight weeks old. These ran by the side of their mothers, and appeared to have no difficulty in keeping up with the herd, even when going at full speed."

THE DAMA GAZELLE

(*Gazella dama*)

Addra, DONGOLESE; *Ariel*, SUDANI; *Riel*, DINKA; *Mhorr* OR *Mohr*, ARABIC, MOROCCO; *Kongotong*, MANDINGO

(PLATE X, fig. 5)

The gazelles locally known as the addra and the mhorr have been generally regarded as specifically distinct from the dama; but Mr.

Oscar Neumann, in the *Sitzungs-Berichte Ges. Naturfor. Berlin* for 1906, p. 240, has proposed to regard all three as referable to a single variable species, for which the name *Gazella dama*, as the earliest, should be adopted. He adds that the three giant gazelles, namely Grant's, Sömmerring's, and the dama, appear to be nearly related to the South African springbuck.

The dama, in this wider sense, is the largest of all the gazelles, standing from 36 to 37 inches at the shoulder, and is further characterised by the white of the rump including the whole of, or all but the tip of, the tail, coupled with the absence of a black band to the rump-patch and of a dark flank-band, the large extent of white on the limbs, and the mainly forward direction of the terminal hook of the horns of the bucks, which are relatively short and massive, the maximum recorded length being $14\frac{3}{4}$ inches.

The range of the species includes a large extent of the desert districts of central North Africa from Senegambia to Kordofan and Sennar.

The mhorr, or Morocco race (*G. d. mhorr*), of southern Morocco, has the largest extent of fawn-area. The face has a median rufous streak, and a blackish streak on each side below the eye, while there is a rufous patch between the horns. The rufous of the back is continued down the thighs along the outer sides of the hind-legs, and also extends down the front surface of the front pair.

In the Senegambian race, described by Mr. O. Neumann in the paper already cited as *G. d. permista*, the general type of colouring is very similar to that of *mhorr*, but the rufous is more restricted in extent. Thus the white of the rump extends forwards along the sides of the body in a wedge, so as to leave only a narrow bridge connecting the rufous of the dorsal saddle with that of the thigh. In the fore-legs the upper part is wholly white, but the front surface below the knee is rufous. The dorsal saddle is also smaller than in *mhorr*, extending only about half-way down the sides of the body. The whole region of the nose is white, and there is only a faint dark (not blackish) streak below the eye; while there are only a few rufous hairs between the horns. In some individuals almost the whole head is white, the eye-streak being absent.

The typical race (*G. d. typica*), of which the locality is not definitely known, although it may be the Lake Tchad district, would appear to be very similar to the under-mentioned *ruficollis*, but darker in colour, with a greater extension of the dorsal saddle.

Next we have the addra, or Kordofan race (*G. d. ruficollis*), also

known as the red-necked gazelle, in which the rufous area is reduced to a large saddle on the fore part of the back, continued forwards so as to embrace the throat and neck; the rest of the body and the whole of the head being white, which, at the junction, passes imperceptibly into the rufous. A wash, or even a narrow band, of chestnut may, however, be present on the front of the fore-legs. This race inhabits Dongola, the district between Korti and Ambukol, northern Kordofan, and, if we may judge from a skull in the British

FIG. 56.—Head of the Addra (Kordofan race of the Dama) Gazelle.

Museum, Sennar on the eastern side of the Nile. The great amount of white indicates extreme special adaptation to a desert-life; such a type of colouring probably rendering the animal quite invisible in the shimmering glare. It would be interesting to know whether this shimmer is greater in Kordofan than in the deserts farther west.

The rufous area on the back (which is continuous with that on the neck) is subject to considerable individual variation in intensity. In the specimen of which a coloured plate is given in the *Book of*

Antelopes it forms, for instance, a mere wash of colour; while in a mounted example from near Omdurman presented to the British Museum by Captain Dunn, it is deep rufous all over, and looks like a saddle-cloth thrown over the back. In the latter specimen there is also a faint streak of rufous on each thigh. Similar variations occur with regard to the fore-legs. In the first of the two specimens mentioned above there is a mere tinge of rufous on the front surface below the knees, whereas in the second there is a more or less distinct although narrow line of rufous.

The colouring of this race of the dama is essentially the same as that of the white oryx; the only difference being that in the latter chestnut patches are retained on the face, while the rufous saddle has disappeared. Both are adaptations to a desert existence.

It may be added that in the *Sitzungs-Berichte Ges. Isis* for 1906, p. 15, Mr. K. Heller gave the name of *G. mhorr reducta* to a gazelle, represented by a menagerie specimen, stated to be intermediate between *dama typica* and *d. mhorr*, but nearer to the latter, from which it differs by the smaller horns, the brighter red and less widely spread coloured area, the wholly white fore-legs, and the nearly white head. The latter is fawn only at the back, and blackish at the base of the horns. If this is really a distinct race, it should be called *G. dama reducta.*

THE DIBATAG OR CLARKE'S GAZELLE

(*Ammodorcas clarkei*)

Dibatag, SOMALI

(PLATE X, fig. 6)

With the face-markings of a gazelle, the dibatag combines the horns of a reedbuck, and is therefore entitled to rank as a genus by itself, especially as the neck is longer than in the true gazelles, while the tail is likewise relatively long and thin, and the limbs are also more elongated than in typical gazelles. This species was discovered by Mr. W. H. Clarke in 1890, at the time the interior of Somaliland was being opened up to European sportsmen, and was described the following year by Mr. O. Thomas in the Zoological Society's *Proceedings* (1891, p. 207).

The horns, which are absent in the females, have the general characters of those of a reedbuck, inclining at first upwards and backwards, and then bending somewhat suddenly in an upward and forward direction; they are ridged in front for about half their length, and thus have long smooth tips. The record horn-length is 13 inches, and the shoulder-height about 33 inches. As regards colouring, it will suffice to state that the streak down the middle of the face is deep rich chestnut, while the light face-streaks are pure white, and the general colour of the upper-parts deep cinnamon. There is no dark flank-band. The weight is from 65 to 70 lb.

The dibatag is a native of central Somaliland, where it inhabits the eastern portion of the arid Haud plateau. In his note accompanying the original specimens Mr. Clarke remarked that dibatag "have a very long thin tail, and, when they run, throw it up and over towards the neck. The neck is very long and thrown back towards the tail, so that the two look as if they would touch each other." It was also mentioned that the hoofs, which are less markedly triangular than in Speke's gazelle of the same country, are small in proportion to the size of the animal.

"These gazelles," writes Mr. Clarke, "live mostly among mimosa-bushes, and browse off them and a bush called garrn. They also eat durr grass, which grows 6 to 8 feet high.

"They are to be found near Ber and Buroa Wells, in the Habr-Gerhagis country; but I believe have never been seen any closer to the coast. The 45th degree of longitude is about their extreme western limit. They are numerous a few hours from Buroa Wells, all through the Haud waterless plateau, down to within half a day of Arderdu Wells, in the Marehan country, taking a south-by-east course.

"In these parts they are common enough, but at the same time are very local in their distribution; their range apparently extending, as it were, in a long narrow belt. They are generally met with in small families from three to five, though I have seen as many as nine. Dibatag are found far from water; in fact, they can live through the greatest drought without any. The females generally bring forth their young in October and November, although, I think, in a dry country like Somaliland no fixed time can be set down. I have, however, seen thirty per cent of the bucks rutting in October; and the majority of females seem to bring forth their young in that month."

THE GERENUK OR WALLER'S GAZELLE

(*Lithocranius walleri*)

Gerenuk, SOMALI; *Gudan Godu*, DANAKIL; *Gŭgŭfto*, GALLA; *Ligu*, NODOROBO

(PLATE x, fig. 7)

Although unknown to modern science till 1878, in which year it was named and described, on the evidence of a flat skin from East Africa, by Sir Victor Brooke in the Zoological Society's *Proceedings*, the gerenuk was a familiar animal to the ancient Egyptians, as is proved by a slab in *basso-relievo* with the figures of a male and female, believed to date from about 5600 B.C. When first described the species was included in the genus *Gazella*, from which, however, it was separated—and rightly so—in 1886. With the elongation of the neck and limbs carried to a much greater extent than in the dibatag, the gerenuk shows a further departure from the true gazelles in the general loss of the light and dark face-streaks, which are represented only by a large white patch, including in front an inflated purplish glandular area, round each eye. The horns, too, are widely different from those of the dibatag, being very massive, heavily ridged throughout the greater portion of their extent, widely separated at their bases, and directed at first outwards and forwards, then inwards and backwards, and finally bending forwards in somewhat of a hook at the tip. As in the dibatag, the females are hornless. The skull is likewise very characteristic, being long, low, and very solid in structure, with a large portion (in the bucks) behind the horns. The general colour of the upper-parts is deep rufous fawn, with a band of brown, some eight inches in width, along the middle line of the back. The height at the shoulder ranges from about 36 to 41 inches, while the record horn-length is 17 inches. A full-grown buck will weigh about 115 lb.

The range of this species extends from the Kilimanjaro district of German East Africa through the country in the neighbourhood of Lake Rudolf into Somaliland.

The Somali representative of the species has been separated from the typical African race by Mr. Oscar Neumann in the *Sitzungs-Berichte Ges. Naturfor. Berlin* for 1899, p. 19, and may be known as *Lithocranius walleri sclateri*. This northern race is of larger size than the

southern one, with the neck relatively longer, the colour less rufous, a difference in the form of the white markings on the tail, and finer horns. It also lacks the black knee-tufts found in the typical race. Mr. Rothschild observes (in Powell-Cotton's *Abyssinia*) that although the Somali "gerenuk has been treated as a distinct species both by its describer and Messrs. Sclater and Thomas, I feel sure it is more reasonable to regard it only as a northern race or subspecies, and have therefore recorded it trinomially."

The following excellent description of the Somali race is abbreviated from one furnished by Mr. D. G. Elliot :—

"Waller's gazelle has a very long neck, large eyes, lengthened muzzle, with depressed nostrils and upper lips, and a general shape of face not unlike that of a giraffe. The skull is very wide between the eyes, and rapidly contracts to the nose, causing the head to appear, when viewed from the front, in shape like a wedge. The body, which is moderately long and narrow, is mounted upon long, very slender legs, and terminates in a short, slender, most insignificant tail. The hind part of the skull is greatly extended, so that the horns are nearly midway between the tip of the nose and the back of the head. In front of the eyes, filling up the orbital vacuity, is a conspicuous prominence with a central aperture, from which exudes a black secretion that stains everything it touches, in the same way that ink does. Neither the skin, when removed from the animal, nor the skull, affords any idea of the size of this singular prominence—in fact, there is a cavity in the skull where it is situated; and artists who have attempted to reproduce this species either in a drawing or by a model have failed entirely to present the animal as it appears in life. The skin in front of the eye has usually been laid perfectly flat, and coloured white. The only other animals that I have met with which possess this prominence are the dik-diks, and these, as regards their respective size, have it to an even larger extent than Waller's gazelle."

Since this was written a head has been placed on exhibition in the British Museum (Natural History) showing the true form and colour of the swollen area round the eye, which is doubtless of a glandular nature.

"The gerenuk," continues Mr. Elliot, "is not a graceful animal, as may be imagined, either in figure or in its movements. It walks along in a slouching kind of way, as though it were loose about the joints, and when startled drops its head below the bushes and on a line with its body and sneaks away in a very different manner from the gallant bounding spring with which its relative the dibatag removes itself from the object of its fears. It goes usually in small troops of from three

to ten individuals, and is generally found on stony ground much broken up into ravines and gulleys, and covered more or less densely with trees, bushes, and various species of aloes bristling with thorns.

"The gerenuk is a browsing animal, and not infrequently met with in localities so barren that grass is entirely absent. In such localities it feeds entirely upon the leaves of such trees as it can readily reach; and has the curious habit of supporting itself against the trunk by its fore-feet, and so partly climbing up, and by means of its long neck

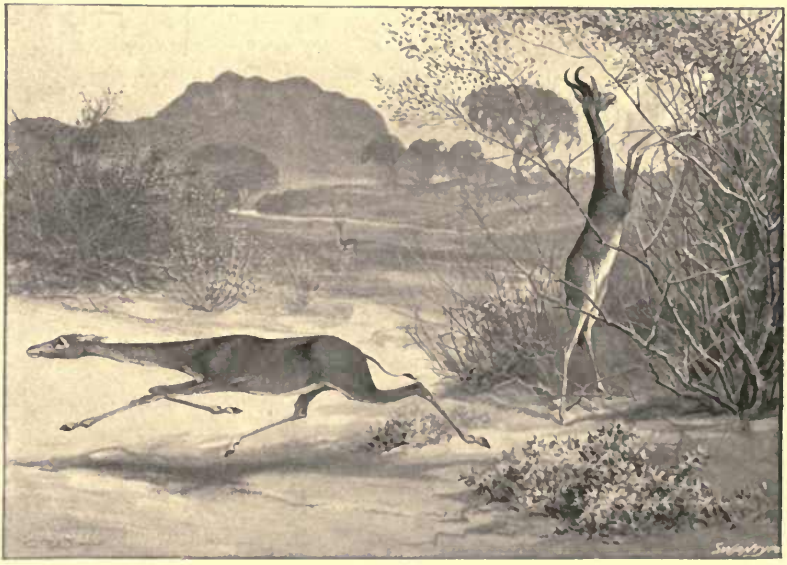


FIG. 57.—Gerenuk at home, from Mr. A. H. Neumann's *Elephant-Hunting in East Africa.*

reaching leaves at a considerable distance, say 6 to 7 feet, from the ground.

"Like all antelopes, this species is possessed of great curiosity, a failing that is often fatal to its safety; and whenever it sees an unusual object, as a hunter, for instance, it will stand absolutely motionless and gaze steadily, sometimes for several minutes. If it sees no movement in the object of its suspicions, it will commence to feed, or walk slowly along in its usual careless way. These moments, when he is being so closely scrutinised, are trying to the hunter, who is obliged to remain absolutely rigid, no matter what his position may be, until the gerenuk is satisfied there is no danger; otherwise, if the slightest motion is detected, the head is dropped behind the bush and

the animal sneaks away. As a rule, a gerenuk does not go very far, and I never saw one that I could not have eventually secured. It only required the exercise of a little time and patience, and an approach to a fair shooting distance could certainly be gained.

"I consider the gerenuk a rather stupid creature, as it does not seem to possess the wariness, watchfulness, and general ability to protect itself from danger which are the attributes of other antelopes. If it can only hide behind the bushes it seems to think it unnecessary to remove itself far from threatened danger.

"The meat is poor and, like the flesh of all other game animals in East Africa, without a particle of fat, and consequently dry and tasteless. Only a few of the natives will eat it, as they consider the animal, with its depressed nostrils and large eyes, looks too much like a camel, and believe that if they eat it a sickness of some kind will carry off their camels. To this superstition the gerenuk owes an immunity from native persecution—at least from all save the Midgans, who eat almost everything they can kill.

"So far as my own observation goes, gerenuk are never seen on the treeless plains, such as those of the Haud, the Morar-prairie, and the like, but resort to hill-sides and summits, which are often barren, but have valleys between them covered with thick thorn-forests. It may be that when they have been seen on open places, they were merely passing from one valley to another.

"The usual gait of this gazelle is a slouching trot, with the head and neck carried very low, on a level with the body. When really frightened, it gallops with considerable speed; stopping, however, at intervals to look back at the object of its alarm. If at such times the hunter is concealed, the gerenuk soon forgets its fears and commences to feed or resume its slow careless walk.

"Certain individuals of this species, of both sexes, have on each side of the face a white stripe running from the eye often to the end of the nose, resembling very much the markings of Clarke's gazelle. This was particularly the case with animals shot south of the Togo plain, where it was seldom one was obtained without this distinguishing character. I was impressed with this peculiarity, and inclined to regard it as of some distinctive value, and should have so deemed it, had I not found occasionally individuals in the country north of Togo possessing a similar stripe, but of less extent and less clearly defined. When plainly exhibited, it gives the head of the gerenuk a close resemblance to that of Clarke's gazelle, as both are similarly shaped, being very narrow and pointed. Taking the extremes of the two

styles—the strongly marked white stripe and its total absence—one would imagine that there were two well-defined races, if not species, of Waller's gazelle."

Writing of the gerenuk in East Africa, Mr. A. H. Neumann observes that "this gazelle is an animal of the desert; that is to say, the East African desert, not the conventional one (a sea of bare sand), but arid, sparsely grassed tracts covered with more or less open scrub, or dry plains with scattered bushes. It is not found in continuous thick bush, although it will sometimes retreat into a patch when alarmed; nor in country where the soil is fertile or the climate moist, and the vegetation in consequence rank. It delights, on the contrary, in barren, rather open scrub, where the hard red soil is devoid of undergrowth, and great patches are bare even of grass, and in sandy or gravelly wastes dotted with stunted thorn-bushes; and in such situations it may be seen in small parties browsing on the leaves of thorny shrubs. As might be inferred from its build, it feeds solely on leaves; and, not satisfied with the advantage afforded by its immensely long neck and lanky legs, it even stands on its hind-legs when reaching after some tempting morsel, with its fore-feet resting on a branch after the manner of a goat. It is thus enabled, by stretching up its neck, to reach to a wonderful height.

"I believe this creature to be independent of water, as it may be seen in the driest parts of the country far from any possible drinking-place. Although it may seem almost incredible that it should be able to derive sufficient moisture for the needs of its system from the sapless leafage of the scraggy desert shrubs, yet it appears proof against the burning dry heat, and may be seen contentedly browsing on the withered foliage of the shadeless dwarf trees and bushes in the fierce glare of mid-day, where the very look of the baked ground is enough to make one thirsty."

According to the account given by Col. H. G. C. Swayne in his *Seventeen Trips through Somaliland*, gerenuk are found all over Somaliland in small parties, but never associate in large herds; the Gadabursi district being perhaps the best country for these antelopes from the sportsman's point of view. Col. Swayne adds that he never observed gerenuk in the cedar-forests crowning the Golis range, nor on the treeless plains of the Haud; their favourite resorts being stony ground with a sprinkling of thorn-jungle.

THE BEIRA

(*Dorcotragus megalotis*)

Beira OR *Baira*, SOMALI

(PLATE x, fig. 8)

Like the two preceding species, this diminutive Somali antelope, which was described, as a kind of klipspringer, by Mr. G. Menges in the *Zoologische Anzeiger* for 1894 (vol. xvii. p. 131), represents a genus by itself. It is likewise regarded as an aberrant member of the gazelle group, although in general appearance it is more like some of the oribi and klipspringer section. From all other representatives of the present group it is distinguished by the short upright horns of the bucks (these appendages being absent in the does), the large, rounded, spreading hoofs, furnished with semi-globular pads on the under surface, and the large size of the broad ears. In stature this diminutive antelope stands about 23 inches, and the record horn-length is only 5 inches. Its colour, judging from the descriptions of those who have shot the animal, may apparently be best styled greyish fawn with a tinge of pink above, and white beneath. A darker flank-band divides the fawn of the back from the white of the under-parts, which latter extends down the inner side of the limbs as far as the knees and hocks.

Vicomte E. de Poncins gives the following account of the resorts and habits of this peculiar little antelope :—

"The beira is a hill-buck, dwelling in the hot and dried-up hills of Somaliland. Its chief food is, I think, dwarf mimosa-leaves and the short and dry grass growing between the stones. I found these antelopes about eighty miles inland, in the steep and desert hills of French Somaliland, and only there. They were about 2500 or 3000 feet above the sea, and appeared to enjoy big rocks and difficult places like chamois in the Alps. They are good climbers, and I do not know of any other game more difficult to locate, their colour matching so exactly with the ground that, when motionless, it is almost impossible to see them. I do not think they mind the want of water, as they never go down to the plains ; and in the hills where I saw them there was absolutely no water, except for a very little dew on the tops of the hills, when the wind blowing from the sea was carrying down clouds along the rocks. Altogether, this is a hard kind

of game to bag; one has to climb in fearfully hot places, over steep rocks, without water, and the animals are difficult to see, rather shy, and, as they are so small, require straight shooting.

"I came across beira quite unexpectedly. I had been after kudu the whole morning, and was sitting close by a Somali shepherd, who was tending goats. He said to me, 'You like shooting a beira?' and took me to the end of the spur, where he pointed downwards. I made out under some leafless bushes about 80 yards away the faint outline of two beiras, which were standing. I fired and broke the fore-leg of

FIG. 58.—Head of Beira, shot and photographed by Lord Delamere.

the male, when both went across a ravine; but at about 120 yards' distance down came the buck with a .303 bullet through the head. Finding there were more of these antelope in the hills, I made up my mind to sleep on the top of a rock about 3000 feet high, where I should have a good view of all the valleys. We reached the place about three-quarters of an hour before sunset, and were just preparing a place for sleeping when a gun-bearer came up in a state of excitement, saying there was a herd of beiras. Running on to some rocks, I saw two of them disappearing at full gallop among some big slabs about 600 feet high. Heading them as best I could, I got to the top

of a projecting rock, and saw, about 200 yards away, six beiras in single file in the middle of the slabs. Resting my rifle, I opened fire, and got three in five shots—two more being obtained subsequently."

Major Powell-Cotton observes that beira are difficult to spot among the jungle; and unless there is time to use the glasses the bucks cannot be distinguished. Owing to their large ears and general appearance, they much resemble overgrown dik-dik. It is interesting to note that although beira closely resemble klipspringer in habits, springing from rock to rock with the same indiarubber-like agility, yet the structure of the hoofs is widely different in the two groups. This is one of many instances in nature where the same end is attained by different means.

THE GEMSBUCK

(*Oryx gazella*)

Gemsbok, CAPE DUTCH; *Kukama*, BECHUANA; *Ko*, BUSHMAN

(PLATE xi, fig. 1)

With the South African gemsbuck (pronounced *hemsbok* by the Dutch), we come to a very distinct subfamily of large-sized antelopes —the *Hippotraginæ*—represented typically by the sable antelope and its allies, but including also the gemsbuck group and the addax. Both sexes are furnished with horns, which are long, heavily ridged, situated over the eyes, and either spiral, straight, or sabre-like in form; those of the females being in some cases longer than those of the bucks, although more slender. The muzzle is hairy, face-glands are wanting, and the tail is comparatively long, and either tufted at the tip, or long-haired for the greater part of its length. From those of all other antelopes the upper cheek-teeth are distinguished by their tall and squared crowns, which are almost precisely similar to those of oxen. In the skull there are neither depressions for face-glands, nor pits in the forehead, while the unossified spaces in the neighbourhood of the nose-bones are minute. The subfamily is confined to Africa, Arabia, Syria, and perhaps some of the adjacent countries.

The leading features distinguishing the members of the gemsbuck group from the other representatives of the subfamily are the straight or sabre-shaped cylindrical horns, the long and more or less bushy tail, the slight development of the mane on the neck, and the smooth or

single-tufted throat ; the horns either sloping continuously upwards almost in the plane of the face, or starting in this plane and then sweeping backwards in a graceful curve.

The markings in the gemsbuck group are of the same type as in the gazelles, the head having a broad dark stripe down the middle of the face flanked on each side by a narrower one in the line of the eye ; these dark stripes being separated by a pair of white ones, and a second pair of light stripes running on the outer sides of the dark eye-stripes. Then, again, the flank shows a broad dark band dividing the fawn of the body from the white of the under-parts. As similar markings occur in the sable antelope, it seems probable that this type of colouring is an ancient one. It is also noteworthy that when, as in the white oryx, the markings tend to disappear and the fawn of the body to be replaced by white, in adaptation to a purely desert existence, the colouring becomes practically identical with that of the addra or Sudan race of the dama gazelle.

Standing about 48 inches at the shoulder, the gemsbuck has the general colour of the upper-parts greyish sandy fawn, with the aforesaid blackish-brown and white markings, white under-parts, and a black heavily-tasselled tail which almost touches the ground. On the face the dark markings may be best described as forming a headstall-pattern, the white eye-stripe not reaching the white of the muzzle, owing to the union of the middle and lateral dark streaks by means of a narrow isthmus at the bottom. A dark dorsal stripe, continued forwards on the neck as a short mane with the hairs inclined towards the head, runs along the middle line of the back to spread out into a large patch on the rump, which is continuous with the black of the tail. Below the rump-patch is on each side a whitish area. Another blackish stripe runs along the throat and chest, which has a tuft of long black hair near the middle of its length. There is also a black patch on the thigh, continuous with the broad flank-band ; and the fronts of the hind-legs are black. The fore-limbs, which, like the hind-pair, are mainly white, have a black garter above each knee, and a small patch on the front surface below the same.

The two longest pairs of horns on record measure respectively $47\frac{1}{2}$ and 46 inches, but the sex of the animals to which they belonged is unknown. The next longest specimens, known to be those of cows, measure respectively $45\frac{1}{2}$ and $45\frac{1}{4}$ inches.

The gemsbuck, or South African oryx, as it is often called, is a native of the open semi-desert plains of the south-western regions of the continent from the Great Karoo of the heart of Cape Colony to the

northern karoos, and thence through the Kalahari desert and the plains of Damaraland to the open tracts of the Mossamedes district of southern Angola, and possibly even so far as Benguela. To the northward of the Chobi valley, as likewise in Khamaland, the species seems to have been always unknown. From the greater portion of the northern karoos of Cape Colony gemsbuck have disappeared for more than half a century, although they were numerous there in Gordon Cumming's time (1844). A few, however, still lingered on the plains to the southward of the lower reaches of the Orange river till at least comparatively modern times. On the Great Karoo of the central districts of Cape Colony they ceased to exist long before 1846. A few years ago, and probably also at the present day, the species still abounded in the thirsty districts of the heart of the Kalahari.

Why the old Dutch settlers should have called the gemsbuck after the European chamois (whose name in the German cantons of Switzerland is *gems* or *gemse*) is a question impossible to answer, as both in appearance and habits the two animals, for members of one and the same family, are about as unlike as can well be imagined.

One of the best-established facts connected with the gemsbuck is that, like several other species of antelopes, it is absolutely independent of water, which in the heart of the Kalahari it cannot obtain for several months in succession. This fact should tend to remove the scepticism of many sporting writers as to the capacity of the Indian blackbuck and gazelle for existing without water. In the Kalahari, as elsewhere, gemsbuck go about in herds of considerable size; the members of which, despite the apparent scarcity of suitable food, seem always to maintain themselves in first-class condition. This circumstance also has a parallel among the ruminants of Asia, where some of the wild sheep are found in country which does not look as though it had fodder enough to keep mice in good condition. From a dozen to a score is the usual number of individuals in a herd, but in rare instances the total may reach as many as five-and-twenty, or even thirty. Old bulls are, as usual, solitary.

Naturally, gemsbuck are natives or inhabitants of open plains, or plains sparsely dotted with scrub; but where they have been much hunted they display a tendency to seek shelter in thicker covert. When in racing condition, these antelopes will try the staying powers of the best South African horses, but can normally be ridden down by a well-mounted hunter. A wounded gemsbuck at bay is an animal to which both hunter and hound should give a wide berth; and there seems little doubt that the stories of lions being transfixed with the

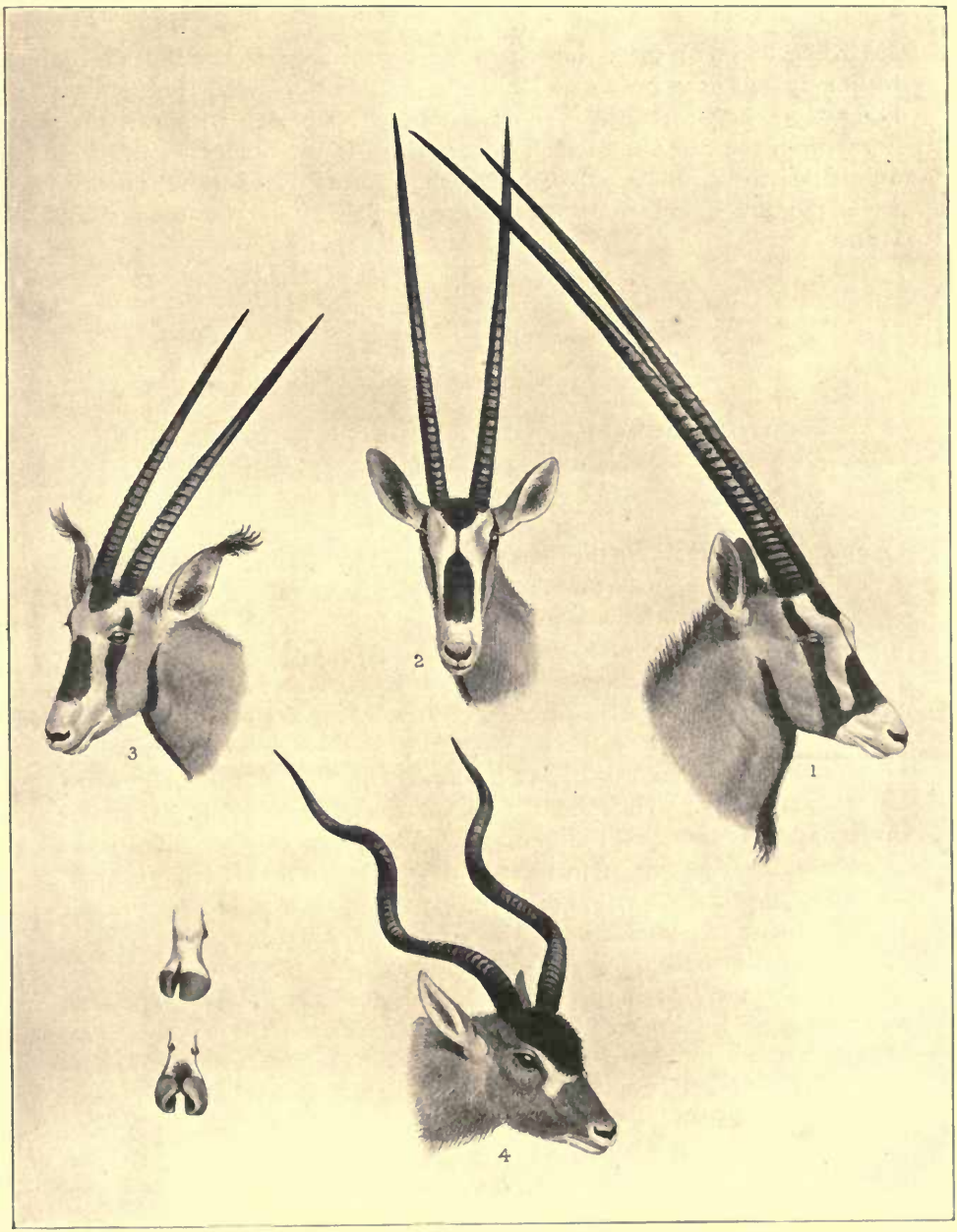


PLATE XI

1. Gemsbuck. 2. Beisa. 3. Fringe-eared Beisa. 4. Addax.

spear-like horns of these antelopes are founded on fact. Indeed, the testimony as to the bodies of lions and gemsbucks having been found lying together—the antelopes having been unable to withdraw their horns from the carcases of their adversaries—is too numerous and well authenticated to be rejected. Gemsbuck-meat is of good quality; while the tough hide of this antelope is in demand for thongs and lashes.

THE BEISA

(*Oryx beisa*)

Beida OR *Beit*, SOMALI; *Chiroa*, SWAHILI; *Ngosorok*, NEMPS; *Sala*, ABYSSINIAN (DANAKIL)

(PLATE xi, figs. 2 and 3)

From the gemsbuck the beisa (or beida, as it apparently ought to be called) is distinguishable at a glance by the relatively broad white eye-stripe being continuous with the white of the muzzle, or, in other words, by the absence of a connection between the lower ends of the middle and lateral blackish-brown face-streaks, which are often shorter than in the southern species, and by the much smaller tail-tuft. There is also no tuft of hair on the throat, while there are no dark markings on the buttocks and thighs; the dorsal stripe is short, and most of the tail is sandy. The horns, too, are much smaller, and also less divergent than those of the gemsbuck. The shoulder-height reaches to as much as 48 or 49 inches; and the weight has been given at 458 lb. A pair of female horns is known which measures 39 inches, while there is a statement to the effect that a pair seen at Aden measured 40 inches.

The beisa, which may possibly be the true oryx of the ancients, and is commonly alluded to by sportsmen under the latter name, is an eastern species, of which the typical race ranges from the neighbourhood of Suakin, on the Red Sea, through the Danakil country and northern Somaliland, southwards along the valleys of the Webbi Shebeyli and Juba to British East Africa as far south as the Tana river. The ears are without tufts, and the light markings on the face and limbs white.

The beisa of Ennia Gallaland has been distinguished by Mr. O. Neumann (*Sitzungs-Berichte Ges. Naturfor. Berlin*, 1902, p. 99) as *Oryx beisa gallarum*, on account of the deeper and more reddish colour of the

upper-parts, and the presence of a wash of reddish or brownish on the white of the limbs. The hoofs also are stated to be longer than in the typical race; while it is suggested that there may be slight differences in the horns.

More distinct is the Kilimanjaro race (*O. b. callotis*), from British East Africa south of the Tana river and the adjacent parts of German East Africa. In this race the ears (which, as in all the members of the group, as befits desert-dwelling antelopes, are narrow and pointed) are surmounted by conspicuous tufts of long black hairs; while this race is likewise distinguished by the rich fawn-colour of the light face-markings, and by the extension of the dark eye-stripe to the lower

FIG. 59.—A Herd of Beisa, photographed by Lord Delamere in East Africa.

jaw, along which it may run to join the throat-stripe. There is also no black on the front of the fore-legs below the knees.

Beisa, which were at one time exceedingly numerous in Somaliland and other parts of East Africa, have the same general habits as gemsbuck. That they can exist for long periods, if not entirely, without water is demonstrated by the occurrence of herds on the Haud plateau of Somaliland, at least seventy miles away from the nearest spring or stream. They are mainly grass-feeders, and appear to rely chiefly on their keen sight for safety from enemies.

The following account of beisa in Somaliland is abbreviated from one furnished by Mr. A. H. Straker:—

"Oryx are generally found in herds of from half-a-dozen to fifty, chiefly composed of cows and calves. In stalking a herd it is almost impossible to distinguish the bulls from the cows, as they are exactly

similar in colour, though the bulls have slightly thicker horns and necks. Solitary bulls are found wandering alone through the country, and are generally old heavy animals. In disposition oryx are shy, wary animals, very hard to approach on the open plains, although when found in bush, with the wind favourable, they can be stalked comparatively easily. The skin on the top of the shoulders is very thick, and much prized for making into fighting-shields by the Somalis, who say that it is tougher than any other hide, and will turn the sharpest spear. The rest of the skin is cut into a long thong, which makes a serviceable rope for tying the loads on camels.

"When oryx are in good condition the meat is excellent; and that of a calf is a positive dainty. A wounded oryx should be approached with care, as it is a vindictive beast and full of courage, and, if not disabled, will make a determined dash at any one coming near, often using its sharp horns with fatal precision. The bulls seem to be very pugnacious, and I have shot several with only one eye. An oryx with a single horn is by no means uncommon.

"Riding down a wounded oryx is very exciting sport, but I never tried to finish one with a spear myself, preferring to carry a light rifle rather than risk my pony getting a prod from those javelin-like horns. I have seen these antelopes charge a mounted Somali most determinedly."

The following observations on the Kilimanjaro or fringe-eared race are condensed from notes written by Mr. F. J. Jackson:—

"The fringe-eared oryx is fairly common in the Galla country, south of the Tana river, and I have seen it within a mile of the sea at Merereni during the rainy season in May 1885. It has, however, never been found on the Athi plains, though, farther south, it is fairly well distributed from Kilimanjaro, its headquarters, as far east as the open country between Maungu and the river Voi, where I saw several good-sized herds in 1888. In the Kilimanjaro district it used to be very abundant, in fact one of the commonest beasts, on the eastern shores of Lake Jipi, and in the country lying between the north-east of the mountain and the Kiyulu hills, and as I never heard of it having suffered from the ravages of rinderpest, it is, no doubt, still common in those places and others suitable to its habits.

"It is a shy, wary animal, and goes about in herds of six or eight up to thirty or more. A single bull oryx, driven out of the herd by a younger and stronger rival, may often be seen with a herd of Grant's gazelle, with which it associates perhaps for the sake of safety as well as companionship. These oryx affect open bush and sparsely timbered country more than the plains, and are found in the dryest

and most arid places at long distances from water. When found in open bush and disturbed, they take to the open for safety, but when wounded, like most other game, they make for the bush. They are grass-feeders and thrive well, being fat and sleek during the hottest and dryest time of the year, when there is not a vestige of anything green. In districts most frequented by oryx, both at Kilimanjaro and near Lake Baringo (where it is the true beisa), there grows a curious low, creeping plant which throws out in all directions tendrils about

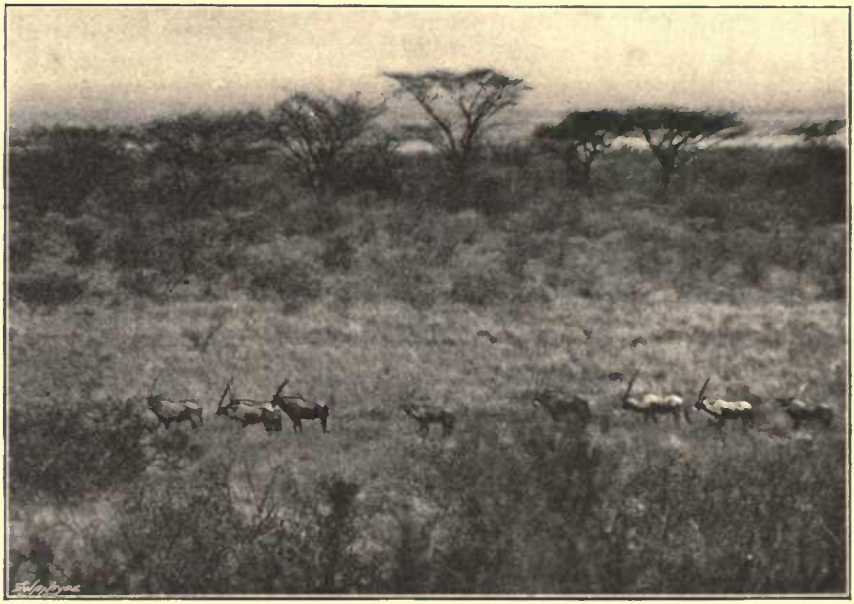


FIG. 60.—Beisa coming to drink at water-holes during drought, from a photograph by Lord Delamere.

18 inches long, covered with a hard, sharp, spiky berry, having a spike sticking upwards. An oryx is at all times difficult to stalk, but these spiky berries render the stalk much more tedious, not to say painful, when on hands and knees, or crawling on one's stomach, as even leather, which will turn most thorns, affords little protection.

"One of the most striking things in a bull oryx is the extraordinary thickness of the skin of the neck and front of the shoulders, no doubt a provision of nature to protect them during the fights that take place during the rutting-season. The neck-skin of a cow is, however, no thicker than that of a hartebeest.

"The young ones are dropped between January and March, and are curious ungainly little creatures until about a year to eighteen months old. The long tufted ears, which are the most marked distinguishing features of this oryx, are carried at a much lower angle than in the true beisa, and closely resemble—on a small scale—those of the roan antelope."

THE WHITE ORYX

(*Oryx leucoryx*)

Abu-harb, SUDANI

The white, or scimitar-horned, oryx (possibly the animal to which the name oryx properly belongs) is a pale-coloured species, with gracefully curved horns sweeping backwards in scimitar-fashion. In height this oryx stands about the same as the beisa. The general colour is whitish, but patches of chestnut occur on the face, neck, shoulders, flanks, and the upper part of the hind-limbs. To a considerable extent (although not on the neck) these chestnut areas correspond in the main with the dark markings of the gemsbuck and beisa. The face-markings are, indeed, identical with those of the latter, the stripe in the middle line being, when fully developed, almost divided into two on the line of the eyes as in those species, although the eye-stripe differs in that its upper portion does not always reach the eye. A tinge on the hind-quarters seems to represent the dark rump-patch of the gemsbuck.

The pale colouring of this oryx (which, as mentioned above, corresponds very closely with that of the addra or Sudan race of the dama gazelle) is evidently an adaptation to a purely desert existence; this species inhabiting much more truly desert countries than either the beisa or the gemsbuck. Chestnut, or tan, it should be mentioned in this connection, is the first stage in the degradation of black towards albinism; and, with the exception of the neck, it is mainly the blackish-brown markings of the beisa which have become chestnut in the present species, while the fawn areas of the former have become white.

The record horn-length is $44\frac{1}{2}$ inches.

The range of the white oryx includes the desert-tracts of North Central Africa from Nigeria and the hinterland of the Gold Coast to Sennar, Kordofan, Nubia, and the Sudan generally.

In most, if not all, modern works on big game and natural history

generally (exclusive of Brehm's *Tierleben*) will be found statements to the effect that the white oryx, together with the addax and the bubal hartebeest, ranges into Syria, or into Syria and Arabia. In some cases, indeed, it is true that a certain degree of qualification is attached to these statements, but in other instances, as in Trouessart's *Catalogus Mammalium*, they are made without any reservation whatever. In the case of the present species there may have been some confusion between the white oryx and the Beatrix oryx (*Oryx beatrix*) of Arabia,

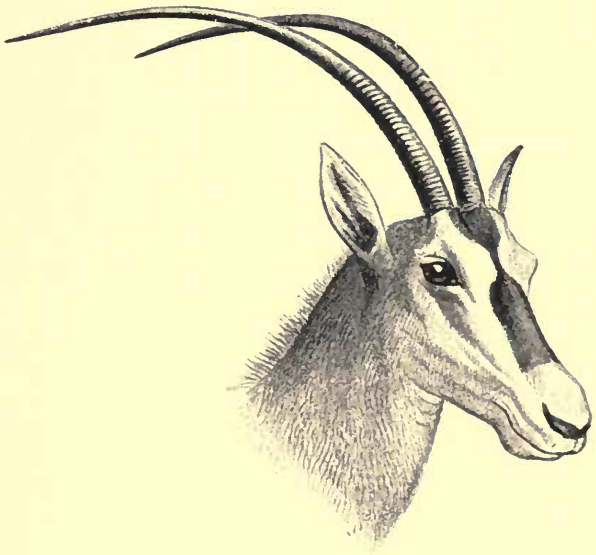


FIG. 61.—Head of White Oryx.

to which latter some writers transfer the name *leucoryx*. These statements appear to be at least very largely traceable to the late Canon Tristram, who in his *Natural History of the Bible* and other works included all three species in the Syrio-Arabian fauna.

As regards the white oryx, Canon Tristram states that although it is still found on the confines of the Holy Land, he never obtained a specimen, but that he had been quite near enough to identify it by its horns. There can, however, be little doubt that the animal he really saw was the Beatrix or Arabian oryx; and, so far as the present writer can ascertain, the white oryx does not apparently occur anywhere to the eastward of the Nile. For further information on this subject

the reader may refer to an article in the *Field* newspaper for 1907 (vol. cx. p. 249).

Before leaving this portion of the subject, it should be mentioned that those naturalists who transfer the name *Oryx leucoryx* to the Beatrix oryx employ the designation *O. algazael* for the present species.

Of the white oryx in its native haunts there is a dearth of information. Its habits are, however, doubtless in the main similar to those of the other members of the group, although, so far as can be ascertained, this oryx associates in parties of smaller size than is the case with its darker-coloured relatives.

THE SABLE ANTELOPE

(*Hippotragus niger*)

Zwart Wit Pens, CAPE DUTCH; *Potoquani*, SOUTHERN BECHUANA; *Qualata inchu*, BAMANGWATO AND MAKALOLO; *Umtjiele*, AMANDEBILI; *Palapala*, MAKALAKA; *Impengo*, MASUBIA; *Ukwa*, MAKOBA; *Impalampala*, SWAZI AND ZULU; *Solupi*, MASARA BUSHMEN; *Pala-hala*, SWAHILI; *Kwalala n'tso*, BAROTSI; *Mperembi*, CHILALA AND CHIBISA; *Mpalara*, M'RUA.

(PLATE xii, figs. 4 and 5)

With this magnificent antelope, which runs the kudu hard as a claimant to be considered the finest representative of the whole tribe, we come to the typical genus of the subfamily *Hippotraginæ*. This genus includes the largest members of the group, and is characterised by the stout and heavily ridged horns rising at an obtuse angle to the plane of the face, and then sweeping backwards in a scimitar-like curve. A well-developed and often upright mane clothes the neck; the throat is more or less distinctly maned; the moderate tail is terminally tufted; the long pointed ears are characterised by their excessive size; and there are tufts of long white hair below the eyes.

The sable coat of both sexes, white under-parts, gazelle-like face-markings, in which the white eye-stripe is continued downwards to join the white of the muzzle, the moderate size of the ears, the length of the mane, and the enormous horns of the bucks, render this antelope so easy of recognition that detailed description is superfluous. It will

suffice, therefore, to state that the shoulder-height of the buck is about 54 inches ($4\frac{1}{2}$ feet); and that a single horn in the Florence Museum measures 61 inches in length, the next best specimen being $52\frac{1}{2}$ inches. The foxy-coloured calves show the same face-markings as their sable parents, and are thereby at once distinguishable from those of the roan antelope.

Blackness in animals is what naturalists term a specialised feature; and from this point of view (as is demonstrated by the fact that the young are chestnut or tan coloured) the sable antelope is a highly specialised creature. Its great specialisation in this respect is indicated by the fact that the sable livery is assumed by both sexes, instead of being, as in Mrs. Gray's and the white-eared kob, confined to the adult males. The species is, in fact, unique among antelopes in this particular. On the other hand, the retention of the gazelline face-markings common to the members of the gemsbuck or oryx group, the relatively moderate size of the ears, and the small development of the eye-tuft, point to the conclusion that the sable antelope is in these respects a far less specialised animal than its less handsomely coloured relative, the roan antelope.

Discovered in the year 1837 by the great hunter Sir Cornwallis Harris in the hills of the Magaliesberg district of the Transvaal, the sable antelope ranges thence northwards to Nyasaland and the neighbouring parts of south-eastern and eastern Africa. South of the Zambesi the range of the species appears, indeed, to have been confined to the eastern half of the continent, except for a western extension along the valley of the Limpopo and the southern bank of the Chobi. Northern Mashonaland seems to have been the district in which it most abounded, and where it is said to have been the commonest of all antelopes; but the eastern part of that country, and thence towards the coast, were also favourite localities. Northward of the Zambesi it was always less common, although the Batoka plateau is one of its present strongholds; and it was never abundant in the Mozambique province.

From ten to twenty is the usual number of individuals in a herd of sable antelope, although occasionally the total may be as many as forty or fifty, while in one herd the number has been estimated at eighty. Very rarely, however, is there more than a single adult bull in a herd, no matter how large. In the districts to the south of the Zambesi adult cows are nearly as black as the bulls, but to the northward of that river the former are stated to be in most cases reddish brown. With regard to the object of the black colouring of this and other sable species, it has been suggested that the dark livery is a

"warning colour." Dr. E. Lönnberg has, however, pointed out that blackness in male animals may more probably be attributed to general vigour of development, and to the necessity for using up superfluous products in the organism. It is analogous, in fact, to the development of the comb in the cock, and the dark colour and curved lower jaw in the male salmon. When once firmly established in the male, the black livery may make its appearance, as a secondary development, in the female, as in the case of the present species.

The coat of the sable antelope is in best condition and darkest in colour immediately after the rainy season, when food has been abundant, the mane being then so long as to fall partially to one side. But early in the dry season, that is to say towards the middle of June, the long hair on the neck begins to be shed, and by September there is little left except short brownish hair, with numerous bare patches; while the coat on other parts becomes scantier and duller. In fact, at this season the animals present a decidedly poor and untidy appearance, very different from their look a few months later, when they once more don their new spring coats. Sparsely forested, grassy upland districts form the favourite resorts of the sable antelope; and it is on this account that the species is so abundant in Matabililand, Barotsiland, and Mashonaland. During the rains these antelopes are stated, however, to retire to thicker forest at lower elevations for the sake of shelter. And in some instances they may be found on rough, rocky ground, where they display considerable activity in ascending and descending bad places. Early spring, that is to say during the months of September and October, is the chief calving-season, although a few cows may produce their young a month earlier. As already mentioned, the face-markings of the calves are similar to those of the adults; but in newly dropped calves these markings are stated to be less distinct.

Sable antelope have the reputation of being the most high-couraged of all the antelope tribe; and a wounded bull at bay, with its tremendously powerful and wide-reaching horns, is an antagonist which should on all occasions be treated with respect and caution. Nevertheless, they do not often charge their adversaries, preferring to maintain a defensive rather than to assume an aggressive attitude.

The following account has been somewhat abbreviated and otherwise slightly altered from one supplied by Mr. Selous:—

"A sable antelope bull, when alone," writes the great hunter, "can be brought to bay by dogs very quickly even when unwounded. But when a herd is pursued by dogs, neither the bull nor any of the cows

PLATE XII

1. Eland (male).
2. Lord Derby's Eland (male).
3. Eland (female).
4. Sable Antelope (male).
5. Sable Antelope (female).
6. Roan Antelope (male).
7. Roan Antelope (female).

will come to bay, although now and then one will charge out at one of the dogs, and then immediately rejoin the herd. I have seen many sable antelope bulls brought to bay by dogs ; but I never saw one of these antelopes, when unwounded, lie down to fight, as they usually do when badly wounded. They use their horns with marvellous quickness and dexterity, and if, as they stand or lie at bay, an assegai is thrown at them, they often break the shaft with a sweep of their long curved horns, on the instant that the head of the weapon strikes them ; while if a dog seizes them anywhere about the flank or hind-quarters, he will almost certainly have a horn driven right through him before many seconds. On one occasion, when I saw a wild dog attack a sable antelope bull, it bit its powerful antagonist twice, but each time only snapped, letting go its hold again instantly. These wild dogs run mute, and when in pursuit of sable or roan antelope apparently endeavour to tear open the flanks of their victims by a series of snapping bites, and at length gradually expose and drag out their entrails. Where they have not been much persecuted, sable antelope are amongst the least shy of wild animals ; and the bold and noble bearing of a herd of these antelopes, standing on the slope of a wooded hill, gazing with curious though fearless eyes at the first mounted man to invade their haunts, could not fail to strike the least impressionable of hunters.

"The horns of a sable antelope bull are often beautifully curved, though in this respect they vary greatly, some being much less curved than others. They are always flattened on the sides and ringed to within a few inches of the points. An average length is about 38 to 40 inches over the curve, though horns measuring 42 and 43 inches are not uncommon. The horns of cows are rarely much curved, and, except in exceptional cases, rise straighter from the head compared with the horns of a bull. The average length is about 30 inches, and anything over 34 inches is uncommon ; while a pair that is both very long and at the same time perfectly symmetrical forms an exceedingly rare trophy."

Some years ago the Duke of Bedford had a small herd of sable antelope at Woburn Abbey, where these antelopes habitually resorted to certain bracken-clad slopes. As they stood among the brown fern in autumn they afforded some idea of the beautiful sight a herd must present in its native haunts.

THE ROAN ANTELOPE

(*Hippotragus equinus*)

Bastard Gemsbok, ORANGE RIVER COLONY DUTCH; *Bastard Eland*, TRANSVAAL DUTCH; *Klabakila*, BASUTO; *Qualata*, NORTHERN BECHUANA; *Tai-hait-da*, SOUTHERN BECHUANA; *Ee-taka*, AMANDEBILI; *Ee-pala-pala Chena*, MAKALAKA; *Impengo Eetuba*, MASUBIA; *U-ka-muh-we*, MAKOBA; *Mtagaisi*, SWAZI AND ZULU; *Kwar*, MASARA BUSHMEN; *Ipewa*, CHILALA AND CHIBISA; *Kawalata* AND *Etselta*, NGAMI; *Qualata* AND *Tseu*, BAROTSI; *Gwenki*, HAUSA; *Abu ŏruff*, DINKA; *Abu aruf*, SUDANI; *Wanderbi*, ABYSSINIAN.

(PLATE xii, figs. 6 and 7)

Although considerably exceeding its sable relative in the matter of bodily size (its shoulder-height reaching as much as 4 feet 9 inches), the roan antelope cannot compare in point of beauty with the former, its colour not being of a striking or attractive type; while its horns, for so large an animal, are comparatively insignificant, the record length being only $39\frac{1}{2}$ inches, next to this coming a pair of 35 inches. Nevertheless the present species is a magnificent animal, which in respect of the face-markings appears to be, as already mentioned, more specialised than the sable antelope.

As a roan antelope cannot possibly be mistaken for any other species, it will be unnecessary, so far as description goes, to do more than point out some of the leading features by which it is distinguished from its darker relative. The superior height and smaller horns of the present species have been already mentioned; in addition, there is the colour of the coat, which in the typical race is a grizzled roan, although in the eastern race it becomes sandy or reddish fawn, while in the western race it is of a decidedly dark red. The mane, too, is shorter, while the ears are considerably longer, and the white eye-tufts bigger and more pronounced. Perhaps, however, the most important distinctive characteristic of the species is to be found in the practical disappearance of the gazelle-like face-markings of the sable antelope, which are represented solely by the aforesaid white eye-tuft, although occasionally there may be likewise a white streak behind the eye. Then, again, the whole of the muzzle is white, whereas in the sable antelope the only white portions are formed by the terminations of the

white eye-streak and of the white area on the side of the lower jaw. Similar face-markings are displayed by the calves in the tan-coloured coat.

Although in the southern portion of its range found in the same districts as the sable antelope, the present species has a much wider geographical distribution, extending from the Vaal and the Orange rivers to the Sudan and Abyssinia, and westwards to Angola, Nigeria, and Senegambia.

With such a wide range it is but natural to expect that the species should present a certain amount of local variation; and, as a matter of fact, four such local races are now recognised. The first is the typical southern race of South and Central Africa. Farther north—in British and German East Africa—we come to the eastern race, which was described by Dr. P. Matschie in the *Sitzungs-Berichte Ges. Naturfor. Berlin*, 1898, p. 181, as *Hippotragus langheldi*, and on the same day (November 15) by Mr. Oscar Neumann, in the *Proceedings* of the Zoological Society for 1898, p. 850, as *H. rufopallidus*. It appears, however, that the former name is entitled to stand, as the actual publication of the issue in which Mr. Neumann's race is described did not take place till well on in 1899. The name of this race will accordingly be *H. equinus langheldi*. It is described by Mr. Neumann as differing from the typical race by the absence of brownish or greyish tints in the colouring, which is pale reddish, lighter in some examples than in others, but never of the dark red characteristic of the western race. The legs are, however, dark reddish, in some cases with black markings; the base of the tail and a portion of the rump are black; and the tufts on the ears are shorter than in the next race. This eastern race is represented in the exhibition galleries of the British Museum (Natural History) by a fine male, the gift of Lieut.-Col. C. Delmé-Radclyffe in 1904. The Sudani race, *H. e. bakeri*, which was described in the year 1863 by Heuglin (as a separate species), appears to be closely allied to the last, from which, as already mentioned, it differs by the longer ear-tufts. Lastly, we have the western race, *H. e. gambianus*, typically from Senegambia, named by Dr. P. L. Sclater in the Zoological Society's *Proceedings* for 1896, p. 983, and more fully described by Mr. W. E. de Winton in the *Annals and Magazine of Natural History* for 1899, ser. 7, vol. iv. p. 359, which, as stated above, is distinguished by its deep red colour. This redness is, however, more marked in young than in old specimens, the latter being pale tawny, without any of the bluish grizzling of the typical race.

The species is nowhere so common as the sable antelope.

The following account of its distribution and habits is condensed from one written several years ago by Mr. F. C. Selous, who, after mentioning that he first came across the species in Griqualand West in 1871, observes that it is possible "a few still survive in the same district, as I know roan antelope had not become extinct there in 1886. Travelling northwards, I never met with the species either in Bechuanaland or along the western border of the Transvaal, but should imagine that it once existed throughout these regions, since, according to Sir Andrew Smith, it used to inhabit the country now

FIG. 62.—A Roan Antelope at the Cologne Zoological Gardens, photographed by the Duchess of Bedford.

known as the Orange River Colony and the more northerly portion of Cape Colony. In the southern part of Bechuanaland, along the Notwani river and on the upper Limpopo, near the junction of that river with the Marico, I have seen and shot roan antelope, and from there eastwards and northwards the species used to be generally distributed throughout the greater part of south-east Africa, including the northern and eastern districts of the Transvaal, as well as certain tracts in Swaziland and Amatongaland, in all of which it has, however, now become scarce. In the country midway between the Limpopo and the Zambesi, roan antelope range farther westwards than sable,

as I have seen them on the road between Sode Gara and the Mababi Plain, and also between the latter and Goh-hah Hill; and I also found them not uncommon along both banks of the Chobi. In the flat coast-country between the mouth of the Buzi river and the Zambesi, roan antelope are, to the best of my belief, unknown, and are also absent from the low-lying country on both sides of the Zambesi as far as the Victoria Falls. In fact, I cannot remember to have met with them in any part of south-east Africa where the altitude of the country was much less than 3000 feet above sea-level; and all mountainous districts must be eliminated from their range, as I have never seen them among broken hilly country where there were no fairly level expanses of forest and plain. It is difficult in the case of the roan antelope to say confidently what kind of country is best suited to its habits. In western and southern Matabililand, and throughout the countries watered by the tributaries of the Limpopo, the land is almost everywhere covered either with open forests or thickets of dense thorny bush.

"The roan antelope is generally distributed through these countries, and those who have only met them amidst such surroundings would pronounce them to be a distinctly forest-loving species, like the sable antelope. In Mashonaland they seem, however, to prefer the most open parts of the country; and they used to frequent the high open downs of that part of South Africa in common with the tsessebe, the ostrich, and the blue wildebeest. They were also numerous on the broad treeless turf-valleys at a somewhat lower level, where, in addition to the two former species, they had as companions oribi and Burchell's zebra. I have always noticed that if there are large open spaces of ground free from forest or bush in districts frequented by roan antelopes, they are more likely to be met with in such open places than elsewhere. When I have seen them to the north of the Zambesi, the country has always been very open, and of the same character as the high plateau of Mashonaland. I have never met with roan antelope in very large herds like eland or sable antelope, but have usually found them in bands of from five to a dozen, and have seldom if ever seen upwards of twenty or twenty-five together. Old bulls are generally found alone.

"Usually there will be only one full-grown bull with a herd, but I have occasionally seen two adult males living together in apparent amity with perhaps a dozen females. Though the two species are apparently nearly allied, I never remember to have seen roan antelope consorting with sable antelope, though the former often feed in

company with eland, when the two kinds run off together on being alarmed.

"Roan antelope differ considerably from one another in colour, some being of a light greyish or brownish shade, whilst others are reddish roan or dark grey. When standing in an open plain with the sun shining on them, they often look almost white, which accounts for the name of white sable antelope by which they are known in many native dialects. Like the sable antelope, the roan runs with great speed and endurance, and, except in the case of cows heavy with calf, cannot be run down with an ordinary South African shooting-pony. I have had many a long chase after roan bull on the open downs of Mashonaland, but never succeeded in overtaking one unless it was wounded. After being chased for a mile or two, roan antelope run with their mouths open, but, excepting in the case of cows heavy with calf, which may come to a standstill at any moment, they will go on running until they have tired out any but an exceptionally good horse. The first calves are dropped in August, and the rest in September and October. At first the little creatures are scarcely distinguishable from very young sable calves; but they are somewhat lighter in colour with longer ears, and the incipient face-markings also slightly different.

"When living on open plains, roan antelope are very keen-sighted, and will not allow a mounted man to approach without a hard gallop; but if encountered in open forest in a district where they have not been much persecuted, they will not run until the hunter is pretty near them, and if not pressed will stop and look round at their pursuer, often affording several good chances for a shot before finally settling down to a steady run. When wounded, a roan antelope bull is a fierce and savage animal, and if brought to bay is more prone to charge than a sable antelope under like conditions. I have seen several determined charges made by these animals, and have known one to gore a horse through the thigh. They are also dangerous antagonists if attacked by dogs, but although their shorter horns look better adapted for use than the long curved weapons wielded by the sable antelope, I have never seen such havoc wrought by them amongst a pack of dogs as by the latter. When badly wounded they lie down; and, when assegais are thrown at them, give vent to shrill squealing cries, whilst striking at the shafts of the spears."

Of the western race Major A. J. Arnold gives the following account: "Although fairly common on the middle Niger and along the river Benue towards Lake Tchad, I cannot discover that it is at all frequent

in the hinterland of the Gold Coast, Sierra Leone, or the Gambia, and I cannot hear of it at all in the hinterland of the Cameroons. It is probably very local in habitat, and not so general throughout the hinterlands of West Africa as the hartebeest. I imagine it is confined to districts separated from each other by more or less long stretches of country, where it is unknown. On the Niger its southern limit may be placed at 7° 30′ north latitude, and it is known throughout the middle Niger, and also reported by natives as existing in places in the big bend of the Niger, and between the Niger and Lake Tchad. While it is found in the light bush which the hartebeest frequents, it evinces a decided preference for the more open country farther north, and occurs in fair numbers in open country in Yauri, on the left bank of the Niger, in latitude 11° to 12° north.

"Shy in its general habits, it avoids cultivation or other haunts of men to a greater degree than most antelopes, and it may be roughly stated that where the population of a district is large, and villages and farms lie close together, the roan antelope is not to be found. These antelopes are more often met with singly or in pairs than in herds; and I have never seen them in proximity to other antelopes except on one occasion, when a herd of hartebeest galloped up to me as I was drawing a bead on a roan bull. In pairs they range over a large extent of country in a day, and do not appear to lie up or rest much during daylight. As they wander they feed at intervals, moving quickly over the country, and rarely stopping in one spot. At night they lie up on rising ground, and care little whether they rest in the open, under trees, or among rocks. Stony ground is not an unlikely place in which to come across them; and I have even seen them scrambling over the big boulders of the 'kopjes' of the middle Niger district.

"Their spoor can be distinguished from that of the hartebeest and waterbuck by its greater size, and more especially by the depth of the slot; their weight being easily inferred from the spoor on any ground which will retain a permanent impression. Opinions as to the speed of the West African roan vary considerably. Some sportsmen do not consider them abnormally fleet, and assert that the hartebeest can easily distance them. Others affirm that in their grand stately action they cover an immense distance in very short time, and that they can keep up the swinging canter, their favourite pace, for a long time.

"In hunting roan antelope it seems more or less useless to follow their tracks in the hope of coming up with them. They travel so quickly

at a walk and loiter so little that, given even a few minutes' start, it may take hours for a hunter on foot to come up with them. Their progress is, however, rarely straight ahead, their line being either circuitous or zigzag; and the best plan of hunting seems, after coming across tracks made within the hour, to make a cast in the most likely direction, although only bush-experience can ensure success in making such casts."

Of the Sudan race Major Powell-Cotton writes that "they seemed to prefer a more bushy country than the tora. I also found them on much higher ground than the latter, having shot two while looking for kudu on the hills. A wounded one ripped a man's arm badly while he was trying to cut its throat. The skin is very thick and tough. Tora are often found in company with them, when they are much harder to approach. The largest herd seen numbered twenty-five."

THE BLAAUWBOK

(*Hippotragus leucophæus*)

In a work on the modern big game of Africa very few lines will suffice for the southern representative of the present group—the blaauwbok, or blue antelope, a species which has been extinct for over a century, and of which but few remains are preserved in museums. The species, which was confined to the southern districts of Cape Colony, appears to have been always scarce and local, one of its final refuges being the mountains between Swellendam and Algoa Bay, where the last specimens were shot in 1800. Its colour was bluish grey, with pure white under-parts. Mr. Graham Renshaw in an interesting account of what is known of the species, published in his *Natural History Essays* (1904), states that sixteen specimens are known to have been preserved, but only a few of these appear to be still extant. One skin is now in the Museum at Vienna, a second in Stockholm, a third in Upsala, a fourth in Paris, and a fifth in Leyden. The British (Natural History) Museum also possesses a couple of frontlets with horns believed to belong to the blaauwbok.

In the Report of the Albany Museum for the year 1901 reference is made to the identification among the collection of a pair of horns of the blaauwbok. The horns were entered in one of the old catalogues as belonging to the animal in question; assuming the identification to be correct, the specimen appears to be the only known relic of the

blaauwbok remaining in South Africa. This antelope apparently stood about 45 inches at the shoulder; and the horns of the Paris specimen measure 21½ inches in length along the front curve.

THE ADDAX

(*Addax nasomaculatus*)

Kubaji, ARABIC

(PLATE xi, fig. 4)

Although commonly regarded as most nearly akin to the oryx group, the North African addax resembles sable and roan antelope in the presence of a large white eye-tuft, and may perhaps therefore be more nearly related to the two latter than to the former. Be this as it may, the species, which is the only representative of its genus, is evidently a member of the *Hippotraginæ* which has lost, in its summer dress at all events, the whole of the dark markings characteristic of the more typical representatives of that group, with the exception of a patch on the forehead; the assumption of a uniform pale sandy and white livery being, of course, an adaptation to a purely desert life.

As a genus, the addax is characterised by the long, spirally twisted and closely ridged horns (which recall those of the lesser kudu), and the exceedingly broad and shallow hoofs, somewhat like those of a reindeer. In height the animal stands about 42 inches at the shoulder. The general colour in summer is sandy above and whitish on the rump, under-parts, and limbs, with a brown patch on the forehead, below which are the white eye-tufts; the hair, except on the forehead, being everywhere short, wiry, and somewhat sparse. In winter the typical Tunisian race, at any rate, becomes greyish and longer-haired, while a heavy mass of long brown hair is developed on the neck, shoulders, and forehead, although a chevron below the eyes, the lips, and a spot on each ear are white.

The addax is a native of the desert districts of northern Africa, inclusive of southern Tunisia and Algeria, the Sahara, and the Egyptian Sudan; its southern range in the last-named district extending as far as latitude 7° 15′ N. It has been reported to occur also in Arabia; but, as stated under the heading of the white oryx (p. 289), on apparently untrustworthy evidence.

In 1908 Captain P. E. Vaughan sent to the British Museum the

mounted head and flat body-skin of an addax killed some two miles to the south-west of Dongola, the month when it was shot being given as February. On this I wrote the following note in the *Field* newspaper for the same year, vol. cxi. p. 107 :—

"Although the Dongola specimen was killed in what was practically mid-winter, there is no distinct mane on the fore-quarters, while the hair on the body is short and even lighter in colour than that of a Tunisian specimen in the British Museum in the summer coat. I also notice that there is less white above the eye, and that the horns of the Sudan specimen are rather stouter, and form a slightly less open spiral than in the male from Tunisia. In the Dongola district the winter temperature may be presumed to be considerably higher than that of Tunisia and Algeria, and this would account for the non-development of a thick winter-coat in the Sudan addax, which may now, I think, be regarded as entitled to rank as a separate race. This race must be known by the uncouth title of *Addax nasomaculatus addax*, the name *Antilope nasomaculata* having been first given to the Tunisian animal, while that of *Antilope addax* was subsequently applied to its Sudan representative."

FIG. 63.—An Addax, in summer coat, from Dongola, in the Giza Zoological Gardens, photographed by Capt. S. S. Flower.

Since this note was written, I have been informed by Mr. A. L. Butler that Dongola addax do grow a longer coat in winter than in summer, although to what extent was not mentioned.

The three longest pair of addax horns on record measure, respectively, $39\frac{5}{16}$, $39\frac{1}{2}$, and 39 inches; the second of these being a female specimen.

In general appearance the addax is a somewhat awkward and ungainly animal, very different from the spruce and trim oryx. Of its habits, in common with those of desert animals generally, very little is known. Sir H. H. Johnston writes that "it does not seem to penetrate the Sudan beyond the true limits of the desert, and at the present day does not extend its range in North Africa into the well-watered forest country outside the Sahara desert. It is still found in the extreme south of Tunis, and in the interior of Tripoli, Algeria, and Morocco; and specimens are occasionally obtained from the districts north of the

Senegal river. In former days, judging from the Roman mosaics and frescoes found in North Africa, the addax was a common animal in what would be now called central and southern Tunisia. In North Africa the Arabs pursue the addax on horseback with fleet dogs—usually of the slughi or stout [long-haired, sandy] greyhound breed. Owing to its preference for inaccessible desert tracts, this animal is very rarely shot by Europeans."

THE ELAND

(*Taurotragus oryx*)

Eland, CAPE DUTCH; *Tganna*, HOTTENTOT; *Pofo*, BECHUANA; *Impofo*, AMANDEBILI AND ZULU; *Mofo*, MESHUNE; *Ee-pofo*, MAKALAKA; *Insefo*, MASUBIA AND BATONGA; *Doo*, MASARWA BUSHMEN; *Sefu* OR *Nchefu*, NYASA; *Mpofu*, SWAHILI; *Siruwa*, MASAI; *Singoita*, WANDEROBBO; *Gunga* AND *Oncvema*, ANGOLESE.

(PLATE xii, figs. 1 and 3)

The last subfamily group of ruminants to which the name of antelopes can properly be applied is that of the *Tragelaphinæ*, typified by the bushbucks, but likewise including eland, kudu, bongo, and the Indian nilgai. So far as its African representatives are concerned, the subfamily may be characterised as follows. The species are of large or medium size. With the exception of eland and bongo, the horns are confined to the males, and are spirally twisted, keeled in front and behind, and devoid of ridges. The muzzle is naked, small glands are present on the face, and the tail is long or medium. In most cases white stripes, sometimes with spots, are present on the body, and there is often a white chevron on the forehead. The upper cheek-teeth are remarkable for the shortness and breadth of their crowns.

From the other members of the subfamily, except the bongo, eland are distinguished by the possession of horns in both sexes, those of the females being longer although more slender than those of the males. The horns are directed upwards in the plane of the face, and form a close spiral on their own axis. Both sexes, which are alike in colour, have a deep dewlap; and old bulls develop a large tuft of bushy hair on the forehead. The tail, which is tufted at the end, is comparatively long, reaching to the hocks. Their tawny colour and the strongly twisted horns of the bull distinguish them from bongo. In size eland are the largest of all antelopes.

Eland, the equivalent of the German *elend* or *elenthier* and the Scandinavian elk, was the name applied by the early Dutch settlers to the biggest ruminant animal, other than buffalo and giraffe, they encountered in their new home. So far as bodily characteristics are concerned, there is little in common between the African animal and its European prototype, which latter, by the way, the emigrants had probably never seen in their lives. Since, however, all the above names are connected with the Greek ἔλκυς, signifying strength, there is a certain accidental appropriateness in the application of the designation of the biggest European deer to the largest African antelope.

The range of the eland originally included the whole of southern Africa from Cape Agulhas to the Zambesi, while it also embraces Angola, and extends along the eastern side of the continent as far north as the Tana river.

In height adult bulls are known to stand 5 feet 9 inches at the shoulder, while in some cases they may perhaps reach as much as 6 feet, but statements as to the existence of elands of 6½ feet in height are doubtful.

The record horn-length for bull eland is 37 inches, in a Barotsiland specimen; next to which comes one of 34½ inches from British Central Africa. Of cows, the three longest pairs of horns respectively measure 41, 39½, and 36 inches. In the second of these, at any rate, the horns have scarcely any twist, and are somewhat sabre-like in shape, with a distinct triangular section.

Like most African animals with an extensive geographical range, the eland is subject to a considerable amount of local variation; and upon such differences the following local races have been named.

Firstly, we have the typical southern race, *Taurotragus oryx typicus*, in which the whole body and limbs is pale fawn or cream, without white stripes on the body, white chevron on the forehead, dark knee-bands, or dorsal stripe. The face of old bulls is wholly brown, with a large "bush" of blackish-brown hair on the forehead; while in the cows the middle line of the face is brown, with the sides paler. Calves are similar in colour to the adults.

Although extinct in Cape Colony (the type locality), this race, according to Mr. F. C. Selous, survives in the South Kalahari desert, and in East Africa apparently extends about as far north as lat. 23° S. —that is to say, Matabililand.

North of lat. 23° S., according to the same observer, certain individuals in a herd show more or less distinct white body-stripes and dark knee-bands, thus passing into—

The Zambesi race, *T. oryx livingstonei*, of which the type locality is Sesheke, north of the Victoria Falls of the Central Zambesi,[1] which presents the following characteristics: body-colour a deeper fawn on the back, marked with eight or nine vertical white stripes, more conspicuous in young than in aged animals, a dark dorsal stripe, and dark brown bands above the knees, which tend to fade with age; forehead of old bulls with a dark brown "bush," and typically no white chevron (*teste* the plate in Livingstone's *South Africa*). The calves are reddish fawn.

This race apparently extends southwards of the Zambesi to Mashonaland, as exemplified by a mounted male and female in the British Museum (Natural History). It is noticeable, however, that the bull now shows no dark knee-bands; but probably they have faded out. In Mashonaland, as exemplified by the heads of two bulls figured in Mr. Selous's *A Hunter's Wanderings*, an imperfect white chevron may coexist with a large dark brown "bush" on the forehead, thus leading on to—

The East African race, *T. oryx pattersonianus*, which has the following characteristics (so far as these can be determined mainly from a single specimen): body pale rufous fawn, marked with three distinct white stripes on the withers, and faint indications of other stripes farther back; small dark knee-bands and dark dorsal stripe; forehead of adult bulls apparently with only a small "bush" of long hair, a narrow stripe in the middle line of the forehead above and between the eyes black, the sides of the forehead bright rufous, and an incomplete white chevron below the eyes; and the lower part of the face dark brown, with a fawn patch on each side above the nostril.

Here it may be mentioned that an eland-head from Portuguese East Africa—apparently an adult bull—in the possession of Mr. P. B. Vander Byl, has the face coloured similarly to that of the British East African race, but without the white chevron, although lacking a large frontal "bush." I am informed, however, by Capt. Stevenson Hamilton that two young elands recently caught in Portuguese Africa had the white chevron. It may be added that a few of the bulls in the herd of eland at Woburn Abbey show a chevron, which is, however, buff instead of white.

[1] In his original description of *Oryx* (= *Taurotragus*) *livingstonei* (*Proc. Zool. Soc. London*, 1864, p. 104) Dr. Sclater refers first to eland from Usagara, German East Africa, and then to others obtained by Sir J. Kirk just north of the Zambesi. I consider it, however, admissible to take as the type of this form the eland obtained by Livingstone at Sesheke, as has already been done by Mr. Selous.

From the country between British East Africa and the Bahr-el-Ghazal province of the Sudan no specimens of eland are available ; but it seems quite probable that in this district a race may exist in some degree connecting *T. o. pattersonianus* with the Sudan race of the second species of the genus.

The East African race was first described by me in the *Field* for June 1906 (vol. cviii. p. 579), on the evidence of a head from the Laikipia plateau presented by Lieut.-Col. J. H. Patterson to the British Museum. A fuller description, with plate, appeared in *Novitates Zoologicæ*, vol. xiv. p. 324, 1907.

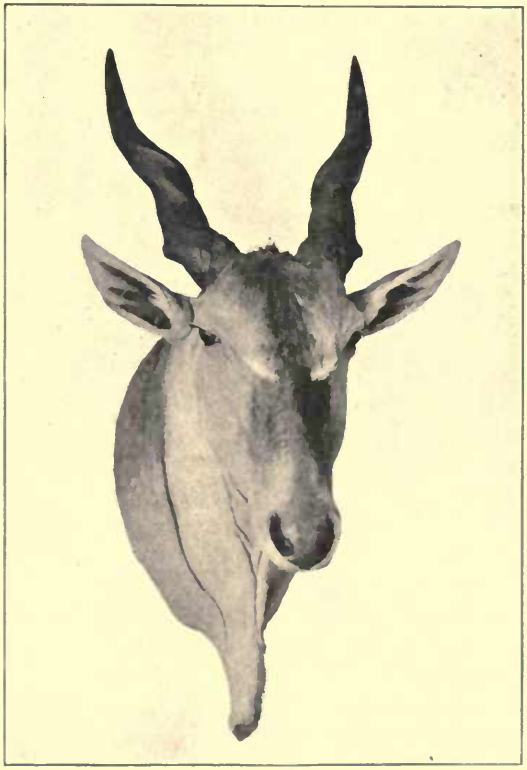


Fig. 64.—Head of East African Eland shot by Lieut.-Col. Patterson on the Laikipia Plateau.

It will be clear from the above that there is a complete gradation in the matter of colouring from the Cape to the East African eland—a gradation which ought to be met with in all cases where we have to deal with races or subspecies, although it has often been eliminated by differentiation. If something approaching a similar gradation is eventually found to connect the East African with the Sudan race of the giant eland, it may be advisable to regard *T. derbianus* merely as a race of the southern species, with the designation of *T. oryx derbianus*.

Whether or no such a gradation, or partial gradation, really exist, it is apparent that eland (which were probably once a northern type, since their fossilised remains occur in the Pliocene or Upper Tertiary strata of southern Europe and India) show a modification from a broad-eared, chestnut-coloured, forest-dwelling animal (*T. derbianus*), profusely

marked on the body with white stripes, and having white streaks on the face, a black neck, and black-gartered legs, to one in which the whole colour (except the face) is pale tawny while the ears are narrow; this latter type being evidently adapted to a semi or complete desert existence. In the matter of gradation (with one gap) from one type of colouring to another as we proceed from north to south (irrespective of whether this gradation is or is not complete), eland present us with a condition exactly paralleled by that which occurs respectively in the cases of the giraffe and the bonte-quagga. Three such parallel instances occurring in the same country are assuredly sufficient to demonstrate that protection is the main factor in the evolution of the colouring of great game animals.

The following account of eland in South Africa is condensed and slightly modified from the one by Mr. F. C. Selous in *Great and Small Game of Africa*:—

After referring to the extinction of the species over the greater part of its southern habitat, the author refers to the report that "a few eland survive amongst the fastnesses of the Drakensberg mountains, where that range divides Basutoland from Natal; but with this exception I doubt whether any are to be found within the borders of Natal, Zululand, Swaziland, Cape Colony, British Bechuanaland, the Orange River Colony, Griqualand West, or the Transvaal. From all these territories they have been driven long ago; but throughout the desert-tracts which lie to the west of the southern portion of Bechuanaland, and thence northwards through the western and northern districts of Khama's country, and eastwards through the northern part of Matabililand and Mashonaland, and indeed throughout the whole of south-eastern Africa from the Transvaal border to the Zambesi (except where European settlements have been formed), eland are, or were recently, to be met with, and often in considerable numbers. In the northern Kalahari between Khama's town of Shoshong and the Botletli river, they wander in small herds, which sometimes collect into great droves, and migrate eastwards as far as the waggon-track leading from Shoshong to the Zambesi. These migrations take place towards the close of the rainy season, in February and March, when eland collect in large numbers in order to eat the berries of a certain small shrub of which they are very fond. In the dry desert country through which the Chobi runs, I always found eland abundant on both sides of the river.

"In eastern Mashonaland, before the advent of Mr. Rhodes's pioneers in 1800, eland were particularly numerous; and I have often

seen herds numbering from 100 to 200 individuals grazing like herds of cattle on the downs stretching from the Makubisi river, where the town of Salisbury now stands, to Mount Hampden on the Gwibi river. The largest herd I ever saw was in December 1879 in the midst of the vast stretch of forest-clad country—often waterless for many months in the year—lying south of the Mababi river. There must have been well over 200 animals in this herd; and among them, or rather bringing up the rear, as they trotted away through the open forest, were twelve old bulls, besides many younger males, which, though larger than the cows, had not yet attained the enormous bulk, and the frontlet of long black bristling hair, characteristic of old bulls. I still remember the sight presented by some 200 pairs of long straight horns, held almost at the same slant, as these eland trotted off in a dense phalanx, and how, when they made a sudden turn and the sun glinted on their straight black horns, my companion compared them to the fixed bayonets of a regiment of soldiers.

"Once in the northern Kalahari I saw a herd of eland entirely composed of young animals. There were quite fifty of them, all calves, from ten to twelve months old, without a single adult animal among them. I have never seen anything of the sort before or since.

"In good seasons eland in the Kalahari desert probably become fatter and heavier than in any other part of South Africa, as the grasses are succulent and nourishing, and cattle and sheep thrive and fatten on them exceedingly well so long as they can obtain water. Eland, in common with gemsbuck, springbuck, and other antelopes, are, however, independent of water, for although they drink regularly in parts of the country where water is plentiful, yet nothing is more certain than that they are able to exist for long periods without even seeing water. During such times they probably obtain the liquid necessary for their subsistence from wild water-melons, and various roots growing at a considerable depth below the surface of the ground in the desert parts of South Africa, some of which contain a great deal of water. I have seen natives dig up these roots, which looked something like turnips, but contained more water than an orange does juice, and have no doubt that the desert-animals are able to scent them and then scratch them up, the soil being soft and sandy; indeed I have often seen places where gemsbuck had dug up these roots.

"The flesh of the eland is often spoken of as though it was always superior to that of all other African antelopes, but this has not been my experience. When an eland is fat and in good condition its meat is juicy, succulent, and well flavoured, although not better than that of

a roan antelope or gemsbuck cow in high condition. On the other hand, in November and December, towards the end of the dry season and the early part of the rainy season, eland get into low condition; and the pasturage being then usually dry and scanty, browse on the leaves of various trees and bushes. At such times their flesh becomes watery, tasteless, and infinitely inferior to the meat of smaller antelopes such as hartebeests, wildebeests, etc., at the same season. In Mashonaland, and south-eastern Africa generally, eland are in the highest condition during March, April, and May; but they are then difficult to secure, since they are never found in open country, but live amongst the broken, rugged hills, covered with thick mahobohobo forest and long coarse grass, which lie below the level of the high plateaus. They are, moreover, at this season never found in large herds, but scattered singly, or in twos and threes, or little herds of four or five to eight or ten in number, all over the country.

"At night eland are fond of raiding the native corn-fields, jumping over the surrounding fences, and seldom or never going through the openings left by the natives, in which pitfalls neatly covered with grass have been dug for their capture. Long before daylight they leave the corn-fields and make for the hills, often climbing a rugged and steep ascent and taking up a position at the top, from which they are able to view or scent any pursuer following on their tracks; so that before he reaches their resting-place, they will be down the other side of the hill, no matter how steep, and far up the side of another, among the mahobohobo trees, at a pace that makes pursuit difficult. In the early part of the year the old bulls are generally alone, and always in thick forest or broken country; and as they are also excessively shy and wary, they are some of the most difficult of all animals to bag at this season. In June—in early years in May—when the natives commence to burn the grass on the high plateau of Mashonaland, the eland gradually collect into herds, and, leaving the shelter of the hills and forests farther and farther behind, wander over the open grassy downs. When encountered in such situations, they can be ridden into and shot with the greatest ease; but as soon as they commence feeding on the young grass, they rapidly fall off in condition. In open country eland fall an easy prey to mounted hunters; as although there are exceptional cows that none but a good horse can run down, a very moderate one is a match for an average bull or cow eland. Contrary to the generally received idea, I have found that eland run best when in good condition before they commence to feed on the young green grass; although when the accumulation of fat round the heart becomes excessive, an old bull

would doubtless not be able to gallop any distance. An eland's natural pace when disturbed is a trot—a long, ground-covering trot, to keep up with which a horse must go at a hand-gallop, but which an eland can maintain apparently without much effort for miles. When a herd of eland starts running, first one, then another of its members will often spring into the air, leaping as high as the backs of its fellows. When pressed, an eland will first trot faster and faster, and then break into a swinging gallop, which it will be able to maintain without a break for from half a mile to a mile and a half; and so long as an eland is actually galloping, none but an exceptionally good horse will be able to pass it, although a fairly good one will keep close up all the time. At length the eland will break his gallop, and, with the foam and slaver flowing from his mouth and flying back over his great neck, now black with sweat, once again commence to trot. He is, however, probably not yet done; and as his pursuer presses close up, will very likely resume his gallop and keep it up for a quarter of a mile or so more. But that will be his last effort; and now you may gallop past him, and shoot him through the heart as he trots past you or try and drive him nearer to your camp or waggon. An eland always runs against wind; it is possible to make him swerve several points to the one side or the other, but I have never yet seen one that could be made to turn right round and run down wind in a direction exactly opposite to the point he was originally making for.

"Eland, I think, are among the least pugnacious of antelopes, and several bulls will always be found harmoniously consorting with every large herd of cows. The latter begin to drop their calves early in June in south-east Africa, a full two months earlier than any of the other antelopes living in the same country. The majority of the calves are, however, born in July; and the late ones in August. The little creatures gain strength very rapidly, and when but a few days old can only be run down by a good horse after a hard gallop for the best part of a mile. After capture they will drink milk readily out of a bowl, and soon become perfectly tame."

The following notes on eland in British Central Africa were communicated by Sir Alfred Sharpe:—

"During the latter half of the dry season, when all grass has grown rank and dry, and especially at the time of bush-fires, when there is no grass at all, eland feed largely on leaves of different trees. To enable them to reach these, they place their feet on the stems of young trees, much in the same manner as goats. Eland are generally

found in small parties: a bull, two or three cows, and their young. But in the West Nyasa high, open grass-country (locally known as 'vipsha') I have frequently found old bulls living an apparently solitary life; and I have seen as many as twenty-five eland in one herd. Eland are not fast; and, even when thoroughly disturbed and alarmed, may often be overtaken by a good runner, as they are given to stopping in their flight to stand and look back. They are quiet and harmless beasts, even when wounded; I have never seen a wounded eland make any attempt at offensive action. They are very different in this respect from many other antelope, especially sable and roan, which are fierce and dangerous at close quarters when wounded. As soon as the morning sun becomes powerful, eland like to get into shade, and often spend the mid-day hours under some leafy tree, their tails in constant motion flicking the flies off their backs. When among trees, this whisking of the tail is sometimes the first thing which catches the eye, and warns one of their presence."

The following observations on East African eland were written by Mr. F. J. Jackson, in 1890, after the great outbreak of rinderpest:—

"Eland can, I believe, like most, if not all, antelopes and gazelles which frequent the open plains, go for two or three days, perhaps more, without drinking; the heavy dew that falls during the night being enough for their requirements. At all events, I have seen a particular herd two or three days running in exactly the same spot and a long way from water, both in the late evening and again early next morning, and found no water in the stomachs of those I killed. They affect park-like and sparsely timbered country and the open bush so often found bordering the plains, rather than the plains themselves, but seek safety and beat a retreat to the open plains when disturbed. Rinderpest carried off the great majority of them at the same time that it swept off the buffalo; and they are now no longer so common as they were. They are, however, on the increase, as a few have been shot within the last two years near Kilimanjaro, and between Kibwazi and Machakos; and I have heard on trustworthy authority of several fair-sized herds having been seen in these places. Since these were all within a few miles of the main road to Uganda, it is possible that they may be on the increase in the almost uninhabited country north of Kilimanjaro. There is also a fair number to be found north of Lake Baringo on the road to Lake Rudolf. Eland are at all times local, and appear to be partial to one particular spot, within a very short

radius of which they will be found day after day, whether they be single old bulls or herds. For this reason it is one of the few beasts that, if seen and left undisturbed (from being, perhaps, in a bad position for a stalk), can be looked for again next day with almost a certainty of being found."

"In Portuguese West Africa," writes Mr. G. W. Penrice, "eland are dispersed over almost the whole of Angola, where they prefer bush-covered country. They are met with sometimes in troops of sixty or seventy, and occasionally in even larger numbers; but more often a troop consists of from twelve to fifteen, mostly cows, very commonly one or two bulls being among them. It is often difficult to get a shot at the bulls, by reason of the way they have of pushing themselves in amongst the cows. Very old bulls leave, or are driven from, the troop altogether, and wander about by themselves in solitude. An eland is a great walker, and his long stride takes him over a great deal of ground, so that one has generally to go far on their spoor before coming up with these animals. The hide of an eland has a peculiar odour, which is by no means unpleasant. The spoor is very similar to that of a buffalo, but rather neater in appearance; the two need never be confused, as an eland, being longer in the body, and standing higher on the legs than a buffalo, takes a much lengthier stride. These animals are very keen of sight, and when on the spoor the hunter must be continually on the look-out, otherwise they will see him and make off before being seen themselves."

In reference to the possibility of domesticating the eland, it was suggested in the *Field* of April 12, 1902, that this was more likely to be successful in Africa than acclimatisation in England. It was soon after announced that Mr. A. R. Jellicoe, of Rhodesia, had succeeded in training a number of young elands for draught. Eight of these, it is stated, had been working in a waggon for months, and were found to be faster and more powerful than oxen.

LORD DERBY'S ELAND

(*Taurotragus derbianus*)

(PLATE xii, fig. 2)

This magnificent eland, of which a bull from the Bahr-el-Ghazal stood 5 feet 8 inches at the shoulder, was first known in this country from Senegambian specimens formerly living in the menagerie at Knowsley, the seat of the Earls of Derby.

From the typical eland it is distinguishable at a glance by the larger and more massive horns, the much broader ears, and the blackish neck, as well as by certain details of colouring, of which the following are the more important. The forehead of sub-adult bulls is wholly chestnut, but later on a "bush" of chocolate hair is developed; there is an incomplete white chevron below the eyes, and the rest of the front of the face is blackish brown, with the exception of a white patch over each eye, including the eyelid; the lips are white, the sides of the face fawn, with a band of chestnut running from between the horn and the ear to the throat, and a white gorget in the middle of the lower part of this band. The sides of the fore part of the neck are fawn, followed posteriorly on each side by a broad oblique blackish band narrowing towards the chest, with a narrow line of white near its hind border; and there is a black stripe along the middle line of the neck, and another on the throat. The body-colour varies from bright chestnut or rufous brown to *café-au-lait* fawn, and the number of vertical white stripes from fifteen or fourteen to about ten. There is a dark dorsal stripe, and black garters are developed above the knees. The two largest known horns measure, respectively, 40 and $39\frac{3}{8}$ inches.

The range of this species extends from the open country in the interior of Senegambia to the Bahr-el-Ghazal district of the Egyptian Sudan and the neighbourhood of Lado.

In the typical Senegambian race, represented at present in the British Museum only by horns, the body-colour is bright chestnut or rufous brown, and there are fourteen or fifteen white stripes.

The Sudani race (*Taurotragus derbianus gigas*), which was named by Heuglin in 1863 as a distinct species (*Oreas gigas*), and of which a head of an apparently immature bull is figured by the Hon. Walter

Rothschild in *Novitates Zoologicæ*, vol. xii. pl. xii. 1905, is stated by Mr. A. L. Butler, in the *Proceedings* of the Zoological Society for 1905, vol. i. p. 288, to differ by its much lighter body-colour (a pale *café-au-lait* fawn), in the greyish white of the black-fringed dewlap, and in the presence of only about ten white stripes on each side of the body.

Mr. Butler's description of this race is as follows :—

"The frontal mat of hair dark chocolate-brown, merging into the colour of the nose, which is black. Sides of the head light grey, becoming pale fawn-colour on the cheeks. From the anterior angle of each eye a narrow white stripe runs forwards and inwards, sharply defining the edges of the frontal mat. On each cheek, about 2 inches behind and rather below the eye, there is a circular white spot about an inch in diameter, surrounding two or three coarse black hairs an inch in length. The upper lip and chin are white.

"The ears are large and wide, externally mostly black, but with grey bases and conspicuous white tips; inside they are black and white. The large pendulous dewlap is whitish grey, with a narrow mane of coarse black hair running below it from the throat to the chest, where it terminates in a large tuft. The hairs in this mane are from 2 to 4 inches in length; at the centre of the dewlap there is a small mingling of white hairs. The sides of the neck are covered with longish coarse hair, brown and black mixed. Round the base of the neck the hair becomes entirely black, forming a conspicuous collar about 8 inches wide. This is sharply separated from the colour of the body by a narrow half-collar of pure white, which extends from the chest-tuft half way to the withers.

"The body is very pale fawn-colour, almost (as Bimbashi Collins terms it) 'café-au-lait,' becoming white on the belly. On the white of the under surface there is a long black patch, commencing in a point between the fore-legs and extending backwards to the navel. A black spinal stripe of longer hair runs the whole way along the neck and body, and from this about ten white stripes run down the sides and haunches. The hair of the body is very short, smooth, and sleek.

"The limbs are pale fawn-coloured, like the body, white on the inner sides, with black patches at the back of the fetlocks and round the pasterns, and black patches 4 inches in length on the back of the fore-limbs, just above the knees."

Captain ("Bimbashi") Collins, from whom most of the foregoing particulars were obtained by Mr. Butler, records the following observations :—

"In the herd I stalked there was one bull which looked enormous, and must have had horns well over forty inches, but I lost sight of him in the bush and shot the younger bull in mistake. The animals were very tame, and were not much disturbed by my firing one shot, but the herd was spread out over so much ground that it was next to impossible to stalk any particular individual."

FIG. 65.—Head of Sudani Race of Lord Derby's Eland, from a specimen shot by Sir Robert Harvey, Bart.

The head of a male of the Sudan race of Lord Derby's eland, shown in fig. 65, is from a specimen shot by Sir Robert Harvey in the Bahr-el-Ghazal in the winter of 1907-8. Although it has the largest horns on record, there is no sign of a frontal bush, the chestnut hair on the forehead being quite short; the hair of the black neck-band is, however, somewhat elongated. In the British Museum this fine species is represented only by horns.

THE BONGO

(*Boöcercus euryceros*)

Bongo, FANTI

(PLATE xiii, fig. 3)

Originally supposed to be confined to West Africa, this brilliantly coloured antelope is now known to range right across the forest-zone into British East Africa. It was long classed with the bushbucks and harnessed antelopes, although separated generically by Dr. Gray as *Euryceros*. That name proved, however, to be preoccupied when the right of the species to generic distinction was fully demonstrated; and Mr. Thomas, in the *Annals and Magazine of Natural History* for 1902 (ser. 7, vol. x. p. 309), accordingly proposed that it should be replaced by *Boöcercus*, in allusion to the ox-like tail.

Agreeing with the elands in the presence of horns in both sexes, and in the tufted tail, the bongo differs by the smooth open spiral formed by the horns, which thus approximate to those of the nyala, and also by the absence of a dewlap and throat-fringe, and of a "bush" of hair on the forehead; the body-hair being everywhere short. In height the bongo stands about 48 inches. The ears are of the broad type characteristic of forest-dwelling antelopes in general; and the glossy coat is bright chestnut-red, with a white chevron on the forehead, a white crescent on the breast, and from about ten to thirteen narrow white vertical stripes on the sides of the body. The tail-tuft is black, and the tips of the otherwise brown horns wear yellow. The record horn-length is 35 inches in the western, and $33\frac{3}{4}$ inches in the eastern race; the longest pair of female horns measuring $30\frac{1}{2}$ inches on the front curve.

The typical race, of which complete skins were first brought to Europe by Paul du Chaillu, is a native of West Africa, ranging from Liberia through Fanti to the Ashkankulu Mountains, the Gaboon, and Sierra Leone.

The eastern race (*B. euryceros isaaci*), which was named by Mr. Thomas in the paper already cited, was first obtained in the neighbourhood of the Ravine Station of British East Africa, and supposed to be, on the evidence of its horns alone, near akin to the nyala. It differs, according to Mr. Thomas, by the larger, heavier, and more convex skull of the bucks, which also display certain other distinctive features

too minute to be mentioned here. The horns, moreover, are believed to be somewhat more massive, and perhaps less angulated, than in the typical race; while the colour is thought to be a richer and brighter rufous. At most, the distinctions appear to be slight and relatively unimportant, although probably sufficient to justify racial separation.

When the eastern race was first described, there was no information with regard to the presence of horns in the females of the western form. It is, however, now definitely known that the females of both races are horned.

The following letter, by the present writer, from the *Field* for 1907 in reference to the occurrence of the species in Sierra Leone, may be quoted at length:—

"As very few British sportsmen appear to have previously bagged the West African bongo, it may be of interest to note that a specimen was shot in July last by Lieut. H. A. Carter, of the West African Regiment, on the Uabole river, some seventy miles north-east of Freetown, Sierra Leone, in a country covered with thin bush and elephant-grass. The animal appears to have been a solitary bull, and, strange to say, is stated to have come almost through the hut-barracks at the Batkanu station. When it caught sight of Mr. Carter it charged at once, but was stopped short in its rush, while as it lay *in extremis* a native hunter, in order apparently to display his prowess, fired a shot at still closer quarters, breaking the right horn asunder. The specific identity of the animal is rendered certain by photographs of the skin and horns forwarded by Major W. Gillman to Mr. Rowland Ward. In Sclater and Thomas's *Book of Antelopes* the range of the western race of the bongo (the only one then known) is stated to be from Liberia to the Gaboon, so the record from Sierra Leone adds a very considerable northward extension to its previously known distribution. It is, however, interesting to note that in the work just cited reference is made to a horn from Sierra Leone, figured by Afzelius in his essay on antelopes, published at Upsala in 1795, which the authors consider may possibly be that of a bongo. The fact that the animal is now definitely known to inhabit that district lends strong support to the suggestion."

The following notes are abbreviated from an anonymous account published in the *Field* for 1908 on the habits and mode of occurrence of the eastern race:—

"Up to the present time the bongo has defied all the white sportsmen's efforts to bring it to bag. The reason for this is that it lives in the dense forest, matted and twined with lianas and creepers

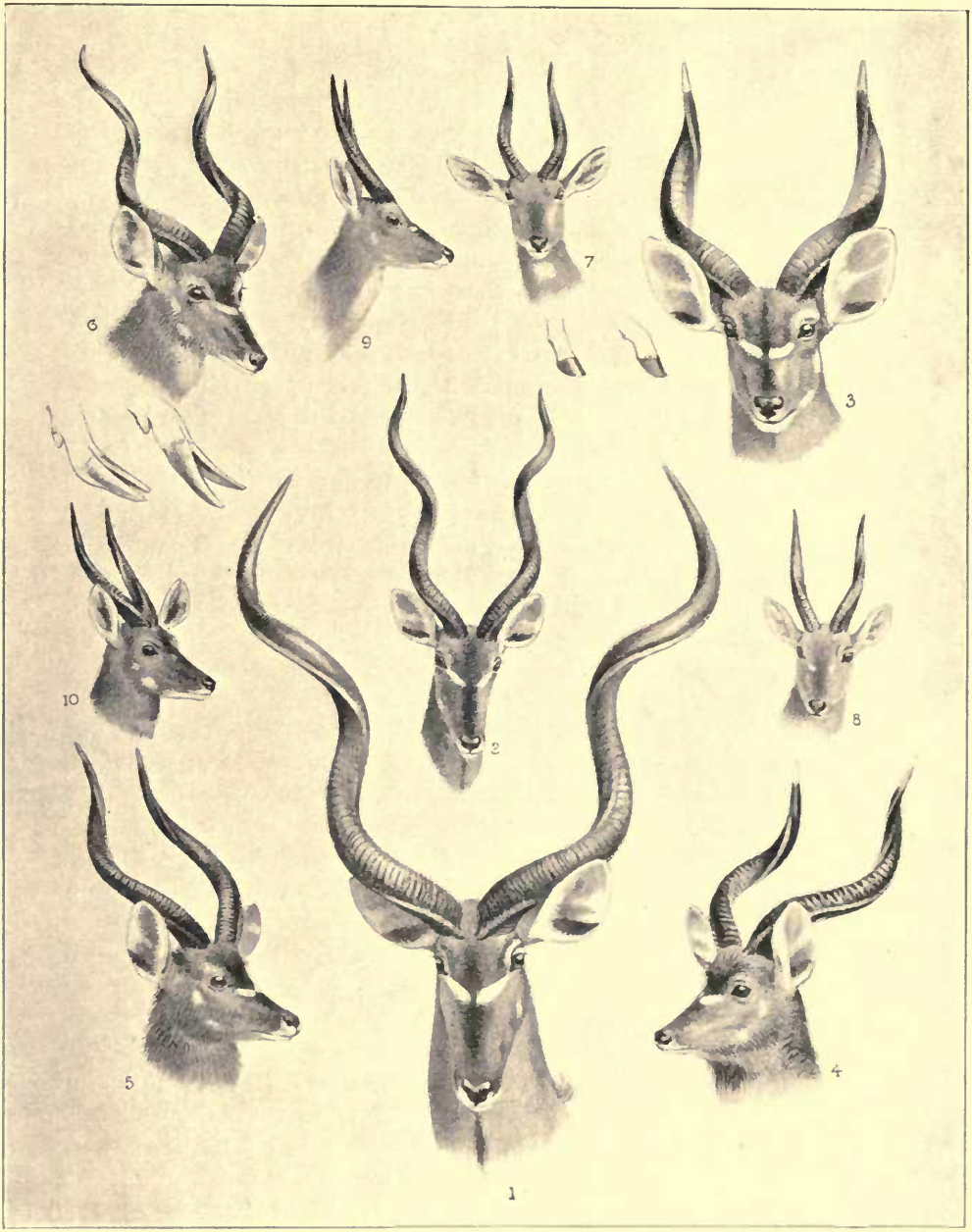


PLATE XIII

1. Kudu.
2. Lesser Kudu.
3. Bongo.
4. Nyala.
5. Western Situtunga.
6. Eastern Situtunga.
7. Abyssinian Bushbuck.
8. Western Bushbuck.
9. Eastern Bushbuck.
10. Southern Bushbuck.

and carpeted with twigs and rotten branches, which make such a noise when trodden on that the bongo has timely warning of the approach of any intruder and makes off. Even the native hunters, whose home is in the forest, are unable to shoot it, though they can catch it in game-pits and traps. I have been unable to find any proof that it has ever been shot by the Wandorobo, as has sometimes been asserted; in fact, the Wandorobo themselves have told me that it is impossible to do so. These forests are generally at an altitude of about 7000 feet above sea-level, and are cold, misty, and damp. Under-foot the ground consists of soft black earth, into which the footprint sinks deeply, and everywhere it is matted with undergrowth. The other denizens of the forest are leopards, the forest-hog, a few bushpig, bushbuck, and dik-dik, and numbers of monkeys belonging to the genera *Colobus* and *Cercopithecus*. In early morning the croaking of the guereza monkey is uttered, answered, and echoed from all round the forest, dying away in the distance, until the stillness is again broken by a sudden crashing among branches overhead, as, forcing one's way along the old track of bongo or forest-hog, one disturbs a troop of the aforesaid monkeys.

"Night is the time during which all the forest-animals, except the birds, are on the move, and then many strange sounds may be heard from its dark depths, while the trilling of the hyraxes is continuous the whole night long. This is the haunt of the bongo, the shyest and least visible of all the denizens, though the spoor of its nocturnal rambles may be everywhere seen, for it feeds only at night, early morning, or late evening, while it lies down during the day; and it is for this reason that it is so difficult to surprise. The wind, moreover, is very treacherous in the forest, although one would imagine there could be none, and this gives the animal additional opportunities of detecting an enemy.

"The spoor is eland-like in shape, and, like the eland, the bongo has a habit of walking forward on the toes, only to a much more marked degree; in fact, the spoor is not so very different from that of the ordinary native cattle, except for the great depth to which the toes sink. This is all the more noticeable on account of the softness of the soil, in which the fore part of the foot sinks in to the depth of 2 or 3 inches, while the rear edge of the spoor slopes up to ground-level.

"There is a wonderful resemblance between the spoor of species belonging to the same group; so much so that if animals were classified by the similarity of their spoor we should probably be not

far out with regard to their relationships. So much is this the case that the first time I saw the spoor of the lesser kudu I had no difficulty in deciding to what animal it belonged from its similarity to that of the greater kudu ; so with the bongo my first impression of the spoor was that it was something between that of an immense bushbuck and an eland. The spoor, however, conveys no idea of the great size of the bongo ; nor does following the track, for the branches and creepers close in after it has passed, making it impossible to believe that an animal as big as a bullock has passed. It is only when one sees the animal lying dead that its bulk is truly realised.

" The food of the bongo is varied, consisting of some of the shoots and trailers on which the goats on the edge of the forest are fed, and short herbage growing round the base of trees such as kudus are fond of. In the forest stinging nettles grow luxuriantly, and also a plant like the nettle in shape, but stingless, both of which are eaten by the bongo. Of other food, bongo eat the bark, pith, and roots of trees, bamboo-leaves, and a plant whose leaves resemble those of a gigantic primrose. Their fondness for pith and the rotten wood of trees which have fallen and decayed with the damp and moisture of the forest is extraordinary. To some of these trees they return night after night, and a broken or dead tree which has gone rotten often has paths leading to and from it, while all round is a cleared space, worn and deeply trodden with tracks. I have seen several of these trees with the bark stripped off and the decayed wood underneath gnawed to the height of 8 feet above the ground.

" To reach to this height the animals put their fore-legs against the tree and rear up like goats or Waller's gazelles. Small trees are sometimes uprooted, the animal digging its horns underneath and levering them up. This is to get at the roots ; and on examining several trees uprooted in this way I have noticed that the leaves are never eaten, though strips of the bark are sometimes torn off. The destructive way in which trees are pulled down and branches and bark torn off reminds one of the handiwork of the eland.

" Like most other bucks, bongo eat the red earth, so common in Africa, in which there is a certain amount of salt, and little shallow basins may often be seen where the ground has been pawed up to loosen the soil. These little basins are peculiar to the bongo, for most other salt-eating animals break off earth from an overhanging bank, or from the side of a termite-hillock.

" Another food to which the bongo is partial is the charred remains of a burnt tree, which it eats in small quantities, probably for the

sake of any salt it may contain. As for voice, bongo do not bark like bushbuck and kudu, but occasionally make a noise like eland. When disturbed, however, they generally dash straight off without any other sound than that made by crashing through the undergrowth. They are generally found in small family-parties, and, although at night the male may walk about and feed by himself, he generally joins a female or two so as to lie near them during the daytime. Their method of making their way through the dense bush is to move in a crouching position, with the neck outstretched and almost level with the ground, and the horns placed flat along the back. In this attitude the whole body takes the form of a wedge, with the nose as the point; and the animal has only to slip its nose through or under the hanging lianas and creepers, and they will slide automatically back over the horns as it presses through, and off the back, generally closing in again after it has passed. If any resistance is met with, the massive weight soon breaks or pushes the offending branch out of the way, while the horns protect the whole of the body from injury, except the flanks, which sometimes get scratched or worn. The huge ears must be rather in the way, although probably necessary to quickness of hearing; and they are generally rubbed bare of hair at the back. The horns of old animals are also much worn on their front surface from the continual friction of branches and leaves.

"Bongo prefer to go under an obstacle rather than over, and practically never jump to clear anything in the way, as does a bushbuck. It would seem, however, that when they pass over an obstacle they take it in their stride, for the ground is never cut up, as it would be in the case of a jump. It is incredible what small holes in the undergrowth they manage to get through or under. From the habit of throwing their horns back when going through undergrowth, an old animal, especially a male, wears quite a bare patch on the centre of his back from rubbing it with the tips of his horns."

Du Chaillu, who believed himself to be the discoverer of the bongo, gave it the name of *Tragelaphus albovirgatus*. It had, however, been named *euryceros*, on the evidence of a pair of horns from the west coast, so early as 1836. In Du Chaillu's *Adventures in Equatorial Africa* will be found a woodcut of a herd of bongo in which all the members are represented with horns. Whether this was done with knowledge that the females are horned is uncertain.

THE BUSHBUCK

(*Tragelaphus scriptus*)

Assali, DANAKIL; *Bata*, M'KUA; *Boschbok*, CAPE DUTCH; *Chiwala-wala*, CHILALA AND CHIBISA; *Decula*, ABYSSINIA; *Dol*, SOMALI; *Ibawara*, LOWER ZAMBESI; *Imbabala*, SWAZI AND BATONGA; *Inkonka* (male), *Imbabala* (female), ZULU; *M'babala*, BAROTSI; *M'babala* AND *Serolo buchuhu*, NGAMI; *Mazo* AND *Bŭlŭmgito*, HAUSA; *Mbawara*, SWAHILI; *Ngabi*, WAGANDA; *Scrolobutuku*, BAMANGWATO; *Umgurungu*, MAKUBA.

(PLATE xiii, figs. 7-10)

With this species we come to a group of medium-sized antelopes differing from the bongo by the absence of horns in the female and of a terminal tuft to the tail, which is of medium length and bushy throughout, in both sexes. The horns of the bucks have an open spiral, with somewhat more than one complete turn. Very marked sexual differences in colour usually occur; the females being nearly always chestnut with white body-stripes, while the males are often darker and more uniformly coloured. All the members of the group are essentially forest-antelopes, but some have taken to a life in marshes and swamps, for which their feet are specially modified.

The bushbuck, as typified by the West African *Tragelaphus scriptus*, is the smallest representative of the genus, ranging from 30 to 36 inches in height, and weighing from 100 to 170 lb. The maximum recorded horn-length is $19\frac{3}{4}$ inches (in the southern race). These bushbucks range practically all over Africa with the exception of bare plains and deserts, and present extraordinary local variation in colouring, as well as remarkable differences in regard to the hair on the neck. In some, for instance, the hairing in this region is normal; but in others there is a kind of collar round the lower part of the neck on which the hairs are quite short, and almost velvet-like in appearance, looking, in fact, as though this part had been shorn. In a bushbuck from the Cameroons (not yet named) the whole neck is stated to be short-haired. The males have a crest of long hairs down the middle of the back, which may be white and erectile, but in other cases is black, as it is almost invariably in females. When fully developed, the white markings on the body take the form of an upper

and a lower longitudinal band, a series of eight or nine vertical stripes, and a number of spots on the hind-quarters and a smaller number behind the shoulder; the ground-colour being bright rufous. A pair of spots may be situated on the nose, corresponding to the chevron of kudu, and also a spot behind and below each eye; while there is very generally a white gorget on the throat and another white band on the chest. The under-parts are normally white; and there is usually much white on the limbs, especially their inner sides.

From such a brilliantly coloured animal there is practically a complete gradation to one in which the colour, when fully adult, is dark with extremely faint or no light markings.

The following list, alphabetically arranged, includes all the various local forms of small bushbucks to which names (either specific or racial) have been given; the description of the colouring being based, except when otherwise stated, on adult males:—

1. *bor*, Upper Nile. Neck normal; crest black; three to five stripes in male, more in female. General colour pale brownish. White markings of limbs well developed (as usual). Female more fully marked than male.
2. *dama*, Kavirondo. Neck with a collar; crest white; no stripes or bands, but lower band indicated by a row of spots. General colour yellowish brown, darker on the under-parts.
3. *decula*, Abyssinia. Neck normal; crest dark; as a rule, no stripes, but a narrow upper band and a line of spots representing the lower band. General colour yellowish.
4. *delamerei*, Somaliland. Described from young female. Neck with a collar; no stripes or spots. General colour dark yellowish brown. White markings on limbs obsolete.
5. *fasciatus*, Somaliland. Neck with a collar; crest apparently white; four or five stripes, but no upper band. General colour reddish.
6. *knutsoni*, Cameroons. Generally like *scriptus* (*typicus*), but with the neck normal, the crest wholly black and developed in both sexes, and black markings on the limbs; eight or nine stripes.
7. *masaicus*, British and German East Africa. Generally like *multicolor*, being reddish brown above and brownish black beneath, but the two colours not so sharply contrasted; much more white on the head, and more spots on the hind-quarters. Also a white nose-spot. The young are much lighter, not black below, and, according to the under-mentioned account by Mr. Jackson, are striped.

8. *meneliki*, Mountains of Central Somaliland. Neck normal; crest black, with traces of white posteriorly; no stripes or bands, and only a few (three or four) faint spots on the hind-quarters. General colour blackish rufous grey, as in *sylvaticus*. A white spot on each side of the nose, and another behind and below each eye; a white throat-band and chest-band.
9. *multicolor*, Hawash Valley, Abyssinia. Neck with a collar; crest black, and also under-parts; no stripes or bands, but four white spots on the hind-quarters. General colour bright rufous brown, with a blackish-brown streak on the nose. A spot below and another behind (but none in front of) the eye white.
10. *nigrinotatus*, interior of Somaliland, on one of the tributaries of Lake Stephanie. Described from female only. Neck normal; crest probably black; no stripes or bands, but numerous spots on hind-quarters. General colour yellowish rufous brown, with a large blackish-brown saddle, and crown, forehead, and nose black. Various white markings on head and throat.
11. *ornatus*, Chobi and Upper Zambesi Valleys. Neck with a collar; crest white; upper band wanting in both sexes, but eight stripes and about fifty spots in male, and three or four stripes in female. General colour dark rufous.
12. *phaleratus*, Congo. Allied to *scriptus* (*typicus*), but typically with upper lateral band obsolete; specimens from French Congo seem, however, to indicate that this character is not constant.
13. *roualeyni*, Limpopo Valley. Neck with a collar; crest white; no bands, but sometimes faint stripes and spots. General colour brownish grey. Females dark red with a few white spots. Immature bucks red, with a few faint stripes and numerous spots. Size smaller and hair longer than in *sylvaticus*.
14. *scriptus* (*typicus*), West Africa. Neck with a collar; crest white; stripes, bands (upper one wanting in a specimen in the British Museum), and spots present. General colour bright rufous. The usual spots on the face, and gorgets on the throat and chest developed.
15. *sylvaticus*, Cape Colony. Neck with a collar; crest white; typically no stripes, bands, or spots on body. General colour dark brown. No white markings on head of buck, but a few small spots on the shoulders and haunches. Females light reddish brown, with white spots on the haunches, and sometimes a few behind the shoulders.

Of these fifteen local types of small bushbucks, Nos. 4, 5, and 11 were named by Mr. R. I. Pocock in the *Annals and Magazine of Natural History* for 1900 (ser. 7, vol. v. pp. 94 *et seq.*), and Nos. 2, 7, 8, 9, and 10 by Mr. O. Neumann in the *Sitzungs-Berichte Ges. Naturfor. Berlin*, 1902, pp. 93 *et seq.* No. 6 was named by Dr. E. Lönnberg in *Arkiv für Zoologi*, vol. ii. No. 15, 1905. The others are earlier, the earliest of all being *T. scriptus*. If all the fifteen forms are regarded as races of a single species (a view by no means universally accepted), the names will stand as *T. s. bor*, *T. s. dama*, *T. s. decula*, *T. s. delamerei*, *T. s. fasciatus*, *T. s. knutsoni*, *T. s. typicus*, etc. etc.

On the subject of the mutual relationships of all these local variations—apart from the question whether they be regarded as local races of a single species or as representing two or more distinct species—we may quote, with some slight verbal alterations, from the paper by Dr. Lönnberg, to which reference has been already made :—

"To group all the different geographical forms naturally, according to affinity, seems at present very difficult, although it is easy to see that some are more closely allied than others. Neumann has tried to divide them into two groups according to the condition of the neck, namely, whether it is well-haired or short-haired. . . . To the former [well-haired] group he refers *T. sylvaticus*, *meneliki*, *delamerei*, and probably *decula* and *nigrinotatus*; to the latter [short-haired, or collared, group] *T. scriptus*, *phaleratus*, *bor*, *dama*, *multicolor*, *masaicus*, and *roualeyni*. This grouping of the races by means of the characteristic mentioned does not, however, seem to be correct, so that the following alterations must be made. *T. sylvaticus* is stated to have a collar of short hair round the neck, and this is also the case with *delamerei*. But, on the other hand, *T. bor* is declared by Thomas to have a well-haired neck.

"The group of bushbucks with well-haired necks thus appears to contain *T. knutsoni*, *T. bor*, *T. decula*, and *T. meneliki*. In all these the dorsal crest is black. *T. nigrinotatus* belongs probably to the same group, but as the male is not yet known, it is difficult to discuss its affinity. The races with more or less short-haired necks have partially or wholly white dorsal crests, except *T. multicolor*, in which the crest is black.

"A grouping of the forms in such a manner seems, however, to depend more upon conditions of environment than upon natural affinity. Neumann, for instance, has indicated something like this when he expresses the opinion that bushbucks with well-haired necks

inhabit mountainous districts, while those with collared necks frequent lowlands. As regards *T. knutsoni* and *meneliki* this is known to be a fact. *T. decula* dwells in the bushy valleys of central Abyssinia, while *T. bor* lives among acacias farther north on the Bahr-Salam and the upper Nile. Hence it seems probable that the races with well-haired necks are instances of parallel development caused by similar natural surroundings; and they may thus have their nearest allies among races with short-haired necks. I am, therefore, inclined to believe that the races named *knutsoni* and *bor*, although well-haired on the neck, belong to the *scriptus* series, and that in the same may be included *ornatus* (*phaleratus*), and perhaps *fasciatus*. All these are provided with a comparatively well-developed pattern of vertical and longitudinal stripes. The East African *T. roualeyni* and *masaicus*, with only vertical stripes, are evidently related; and *T. sylvaticus* may be a further development of the same series. *T. dama* and *decula*, with only longitudinal markings, may, on the other hand, form the centre of a third group, of which the north-eastern races, with both vertical and longitudinal stripes lacking, may be offshoots."

Dr. Lönnberg goes on to observe that since white striping occurs in eland, bongo, bushbucks, and kudu, it must almost certainly be regarded as an ancient characteristic; and he adopts the view, suggested by myself, that it is connected with life in covert, where such a type of colouring appears to be protective. If this be so, it is to be expected that species or races inhabiting more open, and generally drier, country will tend to lose their spots and stripes, as is the case with the southern and eastern races of bushbucks, which are consequently to be regarded as the most specialised representatives of the whole group. It should be added that this is just the opposite of the view taken by Darwin, who attributed the bright colouring of male bushbucks to sexual selection on the part of the females, thus regarding the brightly coloured and profusely marked races as the most specialised instead of the most primitive. The fact that the young of some of the uniformly dark-coloured races are brighter and striped affords conclusive evidence in favour of the former view.

The following notes on the eastern Masai race (*T. s. masaicus*) are condensed from an account furnished by Mr. F. J. Jackson:—

"The bushbuck is widely distributed, and found throughout East Africa where there is a sufficiency of forest and thick bush. On the island of Manda and on the mainland near Lamu it is abundant; and there is also a fair number of them in the vicinity of Kilimanjaro in the Taveita and Kahe forests, but it is perhaps nowhere found in such

plenty as in the forest and wooded hollows and watercourses of Mau, both on the eastern slopes and on the western plateau.

"During the day bushbuck lie up just inside the forest and only come out in the evening to feed, except in places where they are never or rarely disturbed, when they may be occasionally seen throughout the day. Near the Eldoma Ravine Station, on the eastern slopes of Mau, at an altitude of 7500 feet, bushbuck are exceedingly common, so much so that, together with duiker, they at one time became quite a pest and ate up everything in our kitchen-garden, in spite of fences; and even when a war of extermination was waged against them by organised drives, which considerably thinned their numbers, others soon took their place. French and scarlet-runner beans are an irresistible attraction to them.

"The ground-colour of these bushbuck varies from bright chestnut-red to ink-blackish brown, and the older the animal the fewer and more indistinct the spots and stripes become, until they vanish altogether. Many of the old bucks on Mau, from 7000 to 9000 feet, at a little distance look quite black, and they are also slightly bigger and heavier than those found on lower ground; but there is nothing strikingly peculiar in this, as nearly all the birds and smaller mammals with an extensive range, provided they are permanent residents and not immigrants, are, in those high places, much darker than those found 3000 to 4000 feet lower down.

"The bushbuck is an antelope that takes up its quarters in one particular spot in the forest, an isolated patch of wood, or thickly covered belts bordering the course of a stream; such places becoming its regular haunt, where it may be seen day after day in almost the same spot, when it comes out to feed in the evenings and early mornings. If one happens to pass by during the daytime when the bushbuck are lying-up, they will often give notice of their presence by a loud baboon-like bark, should they either hear or scent the intruder. For this reason bushbuck are not difficult to circumvent, as all the hunter has to do is to go out in the evening, about 4.30 to 5 o'clock, or, if in the morning, at daylight, and stroll along quietly outside the forest in the same manner as one does at home in summer when after rabbits with a rifle by a covert-side. If unsuccessful in getting a shot at a buck owing to the presence of does, which, on an average, predominate in the proportion of about two or three to every buck, the sportsman will at least have the satisfaction of locating them in a certain spot, and after taking a note of the position can return some other time, if possible with a day or two's interval. He should

then be on the ground not later than 5 P.M., and take up a position from which, though concealed himself, he can command a good view, and wait patiently until they come out to feed. The does and young ones will be the first to appear; the old bucks rarely venturing out until just before sundown. The does will then have had time to reconnoitre (they appear to rely on their sense of hearing and smell much more than on sight) and settle down to feed; and until the buck appears, I know of few pleasanter ways of spending an hour or so in the quiet cool of the evening than watching two or three of these beautiful creatures within sometimes less than fifty yards, as they slowly and noiselessly move about, delicately nibbling a blade of grass or a leaf from a bush, and every now and again stopping to listen, with their large ears working backwards and forwards. If by some mischance the does see or scent danger and retreat to covert with their loud warning bark, there will be no chance of the buck putting in an appearance that evening until it is too dark to shoot. The does drop their young during February and March.

"The measurements and weights of a buck and doe taken on the spot where they fell are as follows:—

"*Buck.*—Total length, 5 feet 3¼ inches; height at shoulder, 2 feet 11½ inches; tail, 9 inches; weight, 148 lb.

"*Doe.*—Total length, 4 feet 10½ inches; height at shoulder, 2 feet 7½ inches; tail, 7½ inches; weight, 92 lb."

The following (condensed) notes by Mr. F. Vaughan Kirby refer mainly to the Cape (*T. s. sylvaticus*) and Chobi (*T. s. ornatus*) races:—

"This antelope varies so much in coloration in different parts of the country, and even in limited areas, that, interesting as it is, the subject cannot be dealt with fully here. Roughly speaking, I may consider these bushbuck as inhabiting four districts, and differing in appearance in each. That of the Cape Colony is the darkest, being deep brownish black, at a distance appearing quite black. There are a few white spots on the haunches and flanks, perhaps twelve to fifteen, and from two to four faintly outlined stripes over the back and loins.[1] The Natal and East Coast bushbuck is deep brownish grey, with a few more spots and somewhat better-defined stripes. In the eastern and northern Transvaal and Gazaland the ground-colour is deep brownish grey, warmer on the head and lower part of the limbs, with eighteen to twenty-five spots on the shoulders, flanks, and haunches, and three

[1] There appears to be a certain amount of local variation even among the bushbucks of Cape Colony; Mr. Selous (*A Hunter's Wanderings in South Africa*, p. 209) stating that the only markings are a very few spots.

or four fairly defined stripes. On bushbuck from the lower Zambesi the stripes and spots are similarly arranged, but on a dark red ground; while the beautiful Chobi bushbuck [*ornatus*] is also dark red, but with as many as fifty spots on each side, and eight well-defined stripes. All South African bushbuck have, however, the bare 'neck-collar,' the white bars on throat and chest, an erectile mane of white and dark hairs from shoulder to tail along the back, the normal face-markings, and black-tipped tail; while in all the disposition of the white markings on the limbs is similar. The young of the Zambesi bushbucks are less spotted than the adults, but exactly the reverse is the case in the more southern forms. In parts of Cape Colony a browner-coloured bushbuck, said to be longer in the leg than the other, is met with. The maximum shoulder-height I have recorded from the Colony is 2 feet 9 inches for a ram, and 2 feet 5 for a ewe.

"The cry of the bushbuck is a short, deep bark, uttered by both sexes when alarmed, or on seeing anything suspicious, the nature of which they cannot understand.

"These antelopes are found in suitable localities throughout South Africa, and, owing to their retiring habits, will be the last to remain. They are strictly preserved in Cape Colony for six months in each year; and this fact, together with the security afforded by the vast areas of scrub-jungle in the country, has conduced to the perpetuation of the species in larger numbers than anywhere else in South Africa. Thickly wooded country, or open ground intersected by deep bush-kloofs, are the favourite resorts of bushbuck. A certain amount of low bush and scrub is necessary, for in actual forest-country—unless there is some such covert near at hand—they are seldom found. In the great Chiringoma forest of Portuguese East Africa, and also in the Chiperoni forest of Mozambique, for instance, I met with none, while on the scrubby fringe of both they are numerous. Wherever I have met with bushbuck—except in Cape Colony—it has been in the neighbourhood of water; but in the latter country they are numerous in the dry arid jungle-tracts of the Humansdorp district miles from any water. Their food consists chiefly of the leaves and shoots of various aromatic shrubs, but a certain quantity of grass is also eaten. In the dry districts of Cape Colony these antelope freely eat the leaves of the 'spek-boom'; whence, I think, their ability to do without water. Although they seldom eat the young maize-plants in native gardens, they eagerly devour beans, pumpkins, and sweet potato leaves, and underground nuts. Bushbuck run in pairs, but when the ewes are in young the rams lead solitary lives. They seldom leave their retreats

till dusk; but in the early mornings, especially after a cold night, may often be seen standing motionless, sunning themselves at the edge of the bush. In wet weather they are on the move throughout the day, often playing and leaping in a charming manner. Their range is limited over a given tract of country, and old rams will be found year after year in the same bush. Their flesh is excellent eating, better, I think, than that of any small antelope. Young bushbuck are usually born between the middle of October and the middle of December, though often so late as February.

"There is but one admissible method, from a sportsman's point of view, of shooting bushbuck, viz. stalking; for in bush-driving there is an entire lack of what I consider the first great principle of sport—fair play—the winning of trophies by one's own unaided skill in forest-craft."

In an article in the *Field* newspaper for March 14, 1908, on the glands of antelopes, I have suggested that the short-haired collar on the neck of certain races of the bushbuck is glandular in its nature.

THE NYALA OR INYALA

(*Tragelaphus angasi*)

Inyala, ZULU; *Bo*, NYASA

(PLATE xiii, fig. 4)

This handsome bushbuck, which was discovered by Mr. Douglas Angas in the neighbourhood of St. Lucia Bay, near the southern extremity of its range, and named by him after his father, Mr. George French Angas, in the Zoological Society's *Proceedings* for the year 1848, is a slenderly built antelope resembling the preceding species in the normal form of its hoofs, but distinguished by its superior stature. Bucks, for instance, stand about 42 inches at the shoulder, and weigh as much as from 250 to 300 lb. The species is further characterised by the length and shagginess of the coarse hair, and by the striking disparity in the colouring of the two sexes. The bucks are dark greyish brown with a small number of indistinct white vertical stripes, whereas the does are bright chestnut-red with the stripes clearly defined and more numerous (13 or 14). The legs of adult males are tan from the knees and hocks downwards, except just above the hoofs; and the face has an incomplete white chevron, formed by a pair of elongated

white spots in front of the eyes, and two (occasionally three) white spots on each side below the latter.

The original description of the male nyala, based on a skin obtained from Boer hunters, runs (with a few omissions) as follows: "Legs clean, hoofs pointed and black, with two oval cream-coloured spots in front of each fetlock immediately above the hoof. Horns long, twisted, and sublyrate, very similar to those of the bushbuck, but rather more spiral; very sharp polished extremities of a pale straw-colour; rest of horns brownish black, deeply ridged from the forehead to about half the length of the horn. Prevailing colour greyish black, tinged with purplish brown and ochre; on the neck, flanks, and cheeks marked with several white stripes like the kudu. Forehead brilliant sienna-brown, almost approaching orange; mane black down the neck, and white from the withers to the insertion of the tail; ears long, oval, rufous, tipped with black, and fringed inside with white hairs. A pale ochreous circle round the eyes, which are connected by two white spots, forming an arrow-shaped mark on a black ground; nose black; a white spot on each side of the upper lip; chin and gullet white; and three white marks under each eye; neck covered with long shaggy hair, extending also under the belly and fringing the haunches to the knees; two white spots on the flanks, and a patch of long white hair on the interior portion of the thigh, a white tuft under the belly, and another on the dewlap. On the outer side of the fore-legs is a black patch above the knee, surrounded by three white spots; legs below the knee bright rufous colour; tail 1 foot 8 inches long."

This specimen appears to have been somewhat immature, as in fully adult bucks there are no white stripes on the cheek and neck, while the ochery or tan is replaced everywhere except on the lower portions of the legs by greyish. In young males the general colour is reddish brown, as in the adult females.

Mr. Angas described his specimen of the female as follows: "General colour of body rich red-brown, becoming very pale on the belly and lower-parts and white inside the thighs; a black dorsal ridge of bristly hair extends from the back of the crown to the tail; nose black; the white spots on various parts of the body nearly resembling those of the male, only the white stripes on both sides are more numerous and clearly defined, amounting to twelve or thirteen in number; tail rufous above and white below tipped with black."

The record horn-length is $33\frac{3}{8}$ inches.

The range of the nyala is restricted to a comparatively small area in East Africa. As already mentioned, the species was originally

discovered near St. Lucia Bay, in latitude 28° south; and northwards from this spot appears to have once existed in the low-lying coast-country, along the banks of all the rivers flowing into the Indian Ocean as far as the Sabi; while, following the Limpopo, it penetrated a considerable distance inland, a pair having been shot years ago on the lower Oliphants river near its junction with the former. Between the Sabi and the Zambesi nyala appear unknown, though they again occur north of the Zambesi in Nyasaland. In the latter district, according to Sir Alfred Sharpe, "this antelope is found in a piece of thick scrubby country bordering the Moanza, which enters the Shiré on the right bank near the Murchison cataracts. I have never heard of it in any other part of Nyasaland."

Although he has heard of so many as five being found in company, Mr. Selous is of opinion that as a rule nyala live "either alone or in pairs, sometimes accompanied by a last year's fawn, like bushbuck and situtunga. At night they feed on open spaces in the bush, but are never found in such places between daylight and dark, as they have been so much persecuted by the natives that they have grown very wary and cunning. In the jungles between the Usutu and Pongolo rivers in Amatongaland, where I hunted nyala in 1896, there appeared to be no other game of any kind, with the exception of a few bushbucks and bush-pigs. As the country seemed admirably suited for bushbucks, I do not know how to account for their scarcity in this district, except on the supposition that they are driven out of the jungles frequented by the more powerful, though nearly allied nyala. Nyala rams are said by the natives to become very savage when wounded, and sometimes to charge fiercely."

The following account, somewhat condensed from the original, records Mr. A. H. Neumann's experiences of nyala in Zululand:—

"Like its relative the bushbuck (to which it seems to occupy much the same relationship as is presented by the kudu to the lesser kudu), the nyala is essentially a dweller in thick woods, and, like the former, feeds almost exclusively on leaves and weeds, with occasional wild fruit and berries, eating but little grass. Like the bushbuck, it is never found far from water (though it strays farther afield than that thirsty little creature); but, unlike its smaller congener, it never frequents hills, its favourite haunts being the dense coverts in the neighbourhood of rivers and lakes. In the daytime it lies concealed in their shady depths, and only ventures forth at night; although, when not much disturbed, it may sometimes be found browsing in the more open glades just outside their borders during the early morning or late

afternoon. In Zululand bushbuck and nyala inhabit the same coverts, of which fact I had abundant evidence on the Umkuzi river, where both kinds were common; and I frequently shot bushbuck and saw nyala in the same patch of bush during the same ramble, and the tracks of both were everywhere. I have even once killed a young nyala ram by mistake for a bushbuck in thick covert, though a full-grown male might be almost more readily mistaken for a young kudu—a species also found in the same locality. There is a great similarity between the markings of the nyala and of the lesser kudu, as well as a much closer approximation in size, though the former is a more compactly built animal, and the latter an inhabitant of a totally different part of East Africa.

"Nyala differ as to their habits from the smaller bushbuck in that they are gregarious, like kudu. At the present day the herds are small, though the natives assured me that formerly, before the introduction of guns, they were much larger. Sometimes the does with their young and the immature males form herds by themselves; the adult rams living singly or associating together after the manner of other gregarious antelopes. At other times one big ram accompanies a herd of does. A doe is, I think, only found alone when she has a newly born fawn, during July or August."

This account, it will be noticed, differs materially from the one by Mr. Selous in regard to the gregarious habits of nyala. On this point Mr. Neumann quoted the following letter from Mr. C. R. Saunders, sometime Resident Commissioner of Zululand:—

"The largest number of nyala I have seen in one herd is sixteen, of which four were big rams. The herds usually vary from eight to double that number. When they have not been much disturbed you seldom find does alone, although old rams are so found; but at certain seasons of the year when the males separate from the females the former go in small troops, as many as eight being seen together. . . . Having killed a good many, I consider it the easiest animal in these parts to shoot. On one occasion I stalked within 60 yards of five rams in the open, shot one while I was lying down, and immediately rose to my feet, thinking the others would make off; but they stood watching the one that had fallen. I then shot a second with the left barrel. The remaining three still stood, and I could have shot the lot had I wished, as they only moved off on my walking towards them. I have had very similar experiences with them on other occasions. When brought to bay with dogs they are most awkward antelopes to tackle, being very quick and vicious."

The continuation of Mr. Neumann's account is as follows :—

"Although easy to shoot in favourable situations, in parts where it has been much persecuted by the natives the nyala is very wary ; and, keeping as it does during daylight hours to dense covert, to get a shot is difficult. For, let the hunter prowl ever so cautiously through its dark retreats, it is impossible, except by luck, to get more than a momentary glimpse of their occupant, which has been silently listening to his approach. Under such circumstances he can seldom get more than a snapshot at the buck as it projects itself into openings that seem almost impossible for its form to pass through, or creeps under briary tunnels so low that but for the evidence of its spoor one could not believe the animal had really passed that way.

"The native method of trapping these bush-dwelling bucks is by enclosing some much-frequented patch of covert in the heart of their favourite haunts with a fence of brushwood, starting from the bank of the river and returning in a semicircle. In this fence are left little gaps at short intervals, in each of which is set a snare of stout cord, made of tough fibre, with a loop at the end to form a slip-knot. The other end is made fast to a strong growing sapling, which is bent down as a spring over the gap and held so by a little wooden bar (fastened to a smaller cord attached to the noose) inserted in a peg in the ground in such a manner that, on any animal treading on twigs placed artfully across, the spring will be released and the leg of the intruder caught in the snare and hoisted high in the air, thus rendering the victim helpless."

THE SITUTUNGA

(*Tragelaphus* [*Limnotragus*] *spekei*)

Kawi, N. CAMEROONS ; *Mburi*, DUALA (CAMEROONS) ; *Nakong*, BATAUWANI (NGAMILAND) ; *Njobi*, WAGANDA ; *Nkaya* AND *Nkoko*, CONGO ; *N'zoi*, LAKANGA ; *Situtanga*, BAROTSI ; *Situtunga*, *Puvula*, OR *Unzuzu*, CHOBI AND CENTRAL ZAMBESI ; *Zowi* CHILALA AND CHIBISA.

(PLATE xiii, figs. 5 and 6)

From other bushbucks, and for that matter from other antelopes in general, the situtunga, or nakong, is broadly distinguished by the great elongation of its hoofs, which thus afford considerable additional support to the animal when traversing soft mud-flats or yielding reed-beds. On this account it has been proposed to separate the species

from the other bushbucks as the representative of a distinct genus, *Limnotragus*; but since the feature in question is purely one of adaptation to surroundings, while in other respects the situtunga agrees very closely with less aberrant bushbucks, it seems unnecessary to grant it more than subgeneric rank, even if this be really advisable. If a special English name be considered advisable for the situtunga, marsh-buck has been suggested as an appropriate title. Typically an eastern species, the situtunga was originally described in 1864 by Dr. P. L. Sclater on the evidence of specimens brought home by the great explorer Captain Speke from the neighbourhood of the Victoria Nyanza. Sixteen years later the same naturalist, on the evidence of a female skin, gave the name of *Tragelaphus gratus* to the western representative of the species. In 1898 the Hon. Walter Rothschild suggested, however (in *Novitates Zoologicæ*, vol. v. p. 206), on the evidence of information supplied by Mr. Oscar Neumann, that the latter could scarcely be regarded as more than a local race of the former, since the two appeared to intergrade to the westward of Uganda and Unyoro. At the same time Mr. Rothschild separated the situtunga of the Zambesi basin and thence northward to Lakes Nyasa and Tanganyika as a distinct species, under the name of *T. selousi*, on account of the two sexes being coloured alike.

It appears, however, preferable to regard all these three types, together with a fourth described subsequently by Mr. O. Neumann, as races of a species presenting local variations analogous to those of the bushbuck.

In this wide sense the species will be characterised by the great elongation of the main hoofs, the relatively large size of the lateral hoofs, and the longer and more twisted horns, as compared with those of the nyala. There is also no long fringe of hair on the throat comparable to that of the allied species. The face has the usual bushbuck-markings, with the white chevron more pronounced in some cases than in the nyala. The height at the shoulder ranges from about 43 to 45 inches; the record horn-lengths being $35\frac{5}{8}$ inches in the eastern and $34\frac{3}{4}$ in the western race.

The range of this species extends on the eastern side of the continent from the Zambesi and Chobi valleys, northwards to Nyasaland, Tanganyika, and the Bahr-el-Ghazal, and thence westwards through Uganda and Unyoro to Senegambia, Nigeria, the Gaboon, Congoland, and the Cameroons.

In the typical eastern race, from the Victoria Nyanza, the coat, which is long and silky, is uniformly greyish brown on the upper-parts

of the adult male, but bright rufous in the female, with slight indications of stripes; the young of both sexes being coloured nearly like the adult female, although more fully striped and spotted.

On the other hand, in the Zambesi race (*T. spekei selousi*), the true situtunga of the natives, whose geographical range has been already mentioned, the adult female has the same greyish-brown coat as her partner, although rather darker in tint, with less white on the face and throat; while the young are bluish black (very similar to the colour of moleskin), profusely striped and spotted with pale yellow. Both this and the next race appear to be larger than the typical one.

Next comes the western race (*T. spekei gratus*), in which the coat is shorter, and marked in the adults of both sexes with numerous white or whitish spots; its colour in the male being olive or greyish brown, and in the female bright rufous. The adult male has a white dorsal crest, but in the female the dorsal streak is said to be black.

A fourth race (*T. spekei albonotatus*), possibly from Upper Guinea or Angola, has been described (as *T. gratus albonotatus*) by Mr. O. Neumann in the *Sitzungs-Berichte Ges. Naturfor. Berlin*, 1905, p. 90, and is stated to differ from the last in the following points. The chevron on the face of the adult buck is longer and wider, extending upwards to the horns; and the white lines on the sides of the nose are also broader, more distinct, and separated from the front surface of the nose only by narrow black lines. Between these white lines and the white spot below the hind part of the eye is a broad bright yellow band bordering the lower eyelid. The tips of the ears are white. The limbs, especially the hind-pair, are much lighter than in *gratus*; and there is much more white above the hoofs, and on the lower part of the hind-legs, as well as on the front surface of the thighs.

It should be added that *Tragelaphus obscurus*, named by Dr. Trouessart in 1898, on the evidence of a Senegal specimen with shorter hoofs than usual, is very doubtfully distinct.

Writing of the Zambesi race, Mr. F. C. Selous states that in 1887 he obtained "from the natives on the Chobi river the skin of a situtunga taken from its mother before birth. The ground-colour of this skin was of a deep blackish hue (darker than an English moleskin), and the hair beautifully fine, soft, and velvety. It was plainly striped and spotted with bands and spots of yellowish white. The yellowish bands were seven or eight in number, and the spots ran in a line from behind the shoulder along the sides below the ends of the stripes to the hind-quarters, which were profusely spotted. The stripes and spots were arranged exactly as on the coat of the adult

male bushbuck found on the southern bank of the Chobi. I also procured at the same time the skin of a very young situtunga, probably not more than a month old, which had a lighter ground-colour than that of the fœtus, with the yellowish stripes and spots much fainter. In the adult, both male and female, the colour of the coat is a uniform greyish brown on the body, the stripes and spots having usually disappeared, though occasionally a few faint indications of stripes may be seen. Under the belly and on the throat the hair is whitish, and there is also a fairly well-defined, rather broad, white, arrow-shaped mark across the nose, extending to each eye, and also two ill-defined whitish spots on each cheek. The ears are rounded, but smaller in proportion to the size of the animal than in other members of the group. The hair is soft and silky and longer than in any other antelope found in the same country. The hoofs are excessively long, and, when splayed out, prevent the animal from sinking too deeply in the swampy ground in which it lives. As in the lechwi, the skin between the backs of the hoofs and the dew-claws is devoid of hair.

"Owing to the fact that the situtunga lives in the midst of vast reed-beds and papyrus-swamps, and is therefore seldom seen, little is known of its life-history. In 1879 I endeavoured to obtain specimens of these antelopes in the reed-beds of the Chobi, and searched for them in a small canoe paddled noiselessly by a single native, at early dawn and after sunset, through the many small channels by which the reed-bed was intersected. In some places patches of dry reeds had been burnt off, and in such spots I always found tracks of where these situtunga had been feeding on the young reeds springing from the boggy ground. One morning I found a splendid old male lying dead, which had been killed during the night, evidently by another male of its own species, as it had a large wound in the side behind the ribs, apparently made by a horn-thrust. The situtunga seemed, however, never to come out to feed in the open ground except during the night, always retiring into the thick reeds before daylight. I disturbed a few as I passed close in the canoe, and heard them splashing as they plunged through the water amongst the reeds and papyrus, but actually saw only one, a female, that was standing in water that came halfway up her sides, in the midst of a bed of reeds, apparently engaged in feeding on the young shoots that appeared just above the surface of the water. When she saw me sitting in the front part of the canoe she dashed away through the reeds in a series of plunges.

"Although so little is known of these antelopes, there can be no doubt that they are abundant in the reed-beds and papyrus-swamps they frequent; and in certain seasons of heavy floods, when the water in these reed-beds becomes so deep that the natives can paddle all over them in their canoes, great numbers are killed. The headman of a small village on the Zambesi between Sesheke and the mouth of the Chobi told me, for instance, that he and his people once killed fifteen of these antelopes in a single day in a reed-bed near their village during a heavy flood. I also learned from the natives that when in seasons of flood the water in the reed-beds becomes deep enough to allow a canoe to be paddled through them, the situtunga, when they perceive a canoe approaching, do not attempt to run away, but just sink down in the water where they happen to be standing, submerging the whole of their bodies and only leaving their nostrils above the surface. When in this position, they are said to allow a canoe to be paddled alongside them without moving, trusting that their enemies will pass them unobserved, and are then killed with assegais. Examining a considerable number of the skins of situtunga in the possession of the natives of the Chobi and the Zambesi, I found they had all been killed with assegais, and thus have no doubt that they were despatched in the manner described. In very dry seasons I believe the natives sometimes kill situtunga by setting fire to the drier portions of the reed-beds, and driving them into the open channels, when they are speared from canoes while swimming across."

The following account by Mr. Ernest Gedge, which, like the last, has been condensed and slightly modified, refers to the situtunga in East Central Africa:—

"By nature it is extremely shy, and as it seldom ventures outside its retreat, is rarely encountered. When alarmed or pressed, it will take to the water and remain submerged, exposing only the nostrils above the surface for breathing purposes. Captain Speke described it as of a fierce and aggressive disposition when attacked; but this trait I have not so far observed, nor did I ever hear it alluded to by the natives.

"In 1893-94, while travelling in Uganda, in the vicinity of the Victoria Nyanza, we learnt from the Waganda that a certain antelope existed in large numbers on one of the Sesse islands in the lake. At first we disbelieved this report, but finally decided to test its truth. Embarking in four canoes with a number of the Waganda, we made for the island, which was reached on the third day. The island itself lay far from land, and was perhaps half-a-mile in length and a few

hundred yards across at its greatest width. A narrow neck in the centre gave it an hourglass-shaped appearance. It lay low in the water, with rocky shores, and the interior was a tangled mass of heavy bush and undergrowth. A short examination revealed the existence of some kind of antelope, and after crawling in the dense thicket for some time in a fruitless effort to obtain a specimen, we organised a drive with the aid of the canoe-men. Taking our positions at the narrow neck, we gave the signal, and the drive commenced. The antelopes came stealing silently past, like shadows, but so dense was the undergrowth that only a momentary glimpse of them could be obtained. One fine buck leapt over the rock behind which I was crouching, almost on to the muzzle of my rifle, and I was kept busily employed, while frequent reports from the other side told me that Major Williams was having his share of the sport. The second drive from the opposite end of the island was equally successful; but on making a third attempt, not an antelope was seen, and we concluded that they had taken refuge in the water. How these antelopes came to be on the island, or to exist under conditions so entirely foreign to their swamp-loving nature, is a mystery; and we could only conclude that it might possibly be a relic of the ancient Lubaré worship, which deified certain animals and natural objects, and that in accordance with this religion the antelope had been conveyed to the island, and placed there in sanctuary. Whether there is foundation for this theory or not, it is a curious fact that of all the islands which form the Sesse group the antelopes are said to exist on this one only."

Of the western race Sir H. H. Johnston writes as follows :—

"So far as my information goes, derived from inquiries made on the Cameroons river, this animal associates in pairs, male and female. It is very shy, and frequents dense vegetation in marshy localities. The only time I ever saw one in the wild state, it raised its head above a clump of those magnificent six-feet-high *Lissochilus* ground-orchids which line the marshy shores of the Cameroons delta. I wounded it, but it managed to get away for about a mile before it was despatched by my native attendants. It did not seem to be able to move very quickly through the thick vegetation."

Captain Speke received his first specimens of the situtunga from King Rumanika of Karagweh; these consisting of a pair of horns of a full-grown buck, and a living immature buck, which had been recently captured in a reed-brake in one of the neighbouring lakes. At the time of making these gifts King Rumanika was wearing a robe of situtunga-skin.

THE KUDU

(*Strepsiceros capensis*)

Agarzin, ABYSSINIAN; *Eebala-bala*, AMANDEBILI; *Ee-zilarwa*, MAKALAKA; *Dwar*, MASARA; *Godir*, SOMALI; *Itolo*, BASUTO; *Itshongonons*, SWAZI; *Kudu*, HOTTENTOT (?); *Muziloua*, BATONGA; *Ngomo*, CHILALA AND CHIBISA; *Noro*, MASHONA; *Tata*, M'KUA; *Tolo*, BECHUANA, BAROTSI, AND NGAMI; *Unza*, MASUBIA; *Unzwa*, MAKUBA.

(PLATE xiii, fig. 1)

With the lordly kudu we reach the last genus of African antelopes, and at the same time one of the handsomest and most striking representatives of the whole tribe. As to the origin of the name there is some doubt, although, in the opinion of Mr. Selous, it is most probably of Hottentot derivation, as it is certainly not Dutch. Kudu are very closely allied to bushbucks, with which, in the form of the horns, they are intimately connected by the situtunga. The horns, however, form a fuller spiral than in any of the bushbuck group; the ears are larger; the tail is shorter and more bushy, not reaching the hocks; and both sexes, which are fully striped and have the face-markings of the tragelaphine subfamily fully developed, are nearly similar in colouring. There is a mane on the neck, continued along the back as a white crest; but the hair of the body is short. The skull, as in eland, has a deep depression in the forehead, and large unossified spaces in the neighbourhood of the nose-bones. The kudu, or, as it is often called, to distinguish it from its smaller relative, the greater kudu, is characterised by its large stature—from 4 feet 10 inches to 5 feet at the shoulder—the open corkscrew-like spiral formed by the magnificent horns of the bucks, the presence of a thick fringe of long hair on the throat, the great breadth of the ears, and the absence of white throat-bands. The longest pair of horns on record (belonging to Mr. F. H. Barber) measure 48⅞ inches in a straight line; next to which is a pair with a length of 64 inches along the front curve and 41 inches in the straight. The general colouring is too well known to require description.

In suitable, that is to say, in well-watered and more or less bush-covered country, the kudu formerly ranged over the greater part of

Africa south of the Sahara, extending from Abyssinia and Somaliland southwards through East and Central Africa to the Cape, and thence westwards across the continent to Angola, on which side the Congo apparently marks its northern limit. From Cape Colony the species has, however, been exterminated, except where, as in the Uitenhage district, it has been specially protected.

The typical representative of the species is the kudu of South Africa, which has nine or ten vertical white stripes.

The kudu of Somaliland and Abyssinia, as pointed out by Mr. R. I. Pocock on p. 139 of the *Proceedings* of the Zoological Society for 1905, differs from the southern race in having only about five white stripes on each side of the body. The colour is also a greyer fawn than in the southern race. The northern form should thus rank as a distinct subspecies, for which the name *Strepsiceros capensis chora* is available. The difference in colouring seems to be correlated with a difference of habitat, the northern race frequenting more mountainous and less thickly wooded country than the southern, which is often found in the thick jungle along river-banks as well as in the hills.

For the following notes on the range and habits of the kudu in South Africa my readers are indebted to the unrivalled experience of Mr. F. C. Selous. These notes have, however, been somewhat abbreviated from the original, and brought up to date in the matter of names, etc., with certain other minor modifications :—

"This splendid antelope was once widely distributed through the southern portion of the African continent. Two conditions are necessary to its existence, water and bush ; the latter in the shape either of thickets or forests among which there is a good deal of scrubby undergrowth, growing either on rocky hillsides or on level ground. Wherever in South Africa these two conditions were fulfilled—with the single exception of the forests of the Knysna—I believe that kudu were once to be found. In the early part of last century kudu were numerous in many parts of the eastern province of the Cape Colony, but they had become exceedingly rare in those districts at the date of my first visit to South Africa in 1871. Since that time, thanks to legislation on the part of the Cape Government, and the support given to the game-laws by farmers, kudu have increased in numbers in some of their old haunts within that territory ; and in 1895 I was informed that there were supposed to be at least 800 in the district of Swaart Ruggens alone. I do not know whether the first Europeans who travelled through the countries along the

south-east coast between the St. Johns river and the Tugela met with any kudu, but if not, it must have been because these animals had already been exterminated by the natives of Pondoland and Natal.

"North of the Tugela the kudu was, until recently, common along every river flowing into the Indian Ocean, as far north as the mouth of the Buzi along the coast: its range extending along the course of

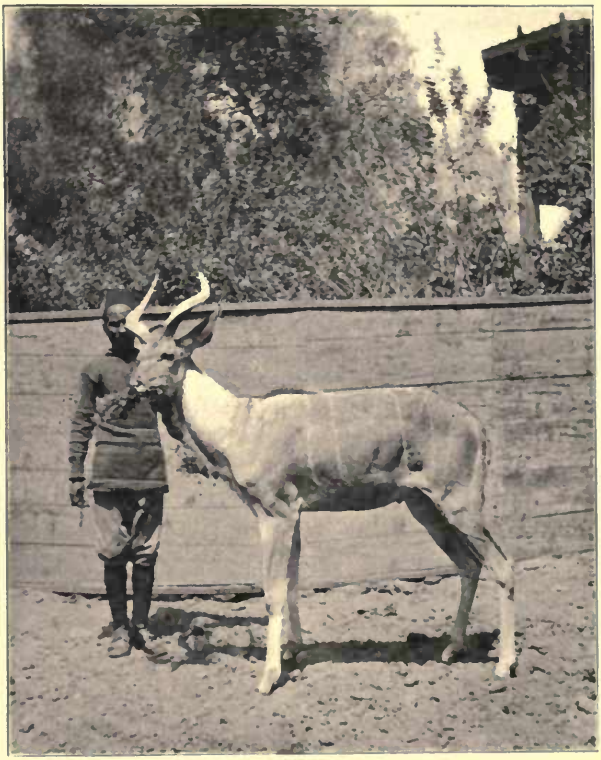


FIG. 66.—A young Kudu from the Sudan, in the Zoological Gardens at Giza, from a photograph by Captain S. S. Flower.

all such rivers and their tributaries, to the edge of the high open plateaus in which they take their rise. On the northern bank of the Zambesi it is again found, and is abundant along the Shiré and its tributaries, and in suitable localities throughout British Central Africa; but, curiously enough, it is unknown along the Pungwi river and its tributaries, and in fact throughout the coast-country between the Buzi river and the Zambesi. About the year 1850 kudu were common in

the country now known as the Orange River Colony, along the course of the Vaal river and its tributaries; and when travelling through Griqualand in 1871 I saw the head and skin of a freshly killed kudu at Campbellsdorp, and was assured that these antelopes were not uncommon in the district, among the rocky scrub-covered hills running parallel with the Vaal river. The kudu inhabiting the countries in the neighbourhood of the Vaal and Orange rivers formed an isolated community, separated from others of their kind by expanses of country unsuited to their requirements. Possibly their ancestors crossed during the rainy season from the head-waters of the Notwani river to the thorn-thickets on the upper Molopo (where kudu were still found not many years ago), and worked their way along that stream till they reached the banks of the Orange river. The waters of the Molopo have, however, long since ceased to reach the Orange river; and so, as kudu cannot cross waterless tracts, the descendants of those which crossed the desert along the banks of the former stream, at a time when western South Africa was better watered than at the present day, became isolated from the rest of their kind, and were gradually driven eastwards by the Hottentot tribes living on the banks of the Orange river into the hilly country along the Vaal.

"I have, indeed, been informed by Mr. F. Barber that he met with kudu in a part of the southern Kalahari where there was absolutely no water; but he told me that they were here living on 'chama,' or wild melons, and I imagine that these kudu having wandered into the desert during the rainy season, and finding that, as the pools dried up, the melons supplied them with the water they required, they remained in the district. And since all animals, including domesticated cattle, lions, leopards, and even human beings, can support life on these melons, this is a special case, and does not put kudu on the same plane with true desert-animals, like gemsbuck, eland, and giraffes. It is, however, possible that in some districts of South Africa kudu have become to a certain extent able to live in waterless tracts; although my own experience has led me to believe that these antelopes, like all the rest of the tragelaphine subfamily, are never found at a distance of more than a few miles from water.

"Kudu are found in the neighbourhood of all the rivers of western South Africa which run through tracts of desert waterless country, such as the Chobi, Tamalakan, Botletli, and Notwani; and during the dry time of year it is hopeless to look for these animals at a distance of more than three or four miles from the river's bank. During the rainy season, however, when the desert-pools hold water,

kudu wander far out into the Kalahari. In support of this view I may say that I have always found both kudu and impala abundant along the desert-road between Sechelis and Bamangwato during the rainy season when the vleys (pools and lakes formed during the rainy season) held water, but absent along the same route when the pools were dry, and they had retreated to the Notwani river. Kudu are very fond of broken hilly country clothed with forest and bush, and intersected by streams flowing through thorn-thickets and clusters of tall feathery acacia-trees ; but hills are not necessary, as these antelopes abound on both banks of the Chobi and many other rivers where there are no hills. Nowhere within recent times were kudu more common than along the Limpopo and its many tributaries, such as the Marico, Macloutsi, Shashi, Tati, and other streams in south-western Matabililand, and the largest horns I have seen were obtained in these districts.

"Kudu are essentially bush-loving animals, and during the greater part of the year seldom met with except in thick covert. Towards the end of the dry season, in September, October and November, they often, however, wander from their usual haunts in search of young green grass, and at such times may be encountered in open forest country, intersected with broad grassy glades. In such situations they can be successfully hunted on horseback. The cows I have always found both fleet and enduring; running lightly and easily, and bounding over fallen timber or other obstacles without apparent effort. Old bulls, on the other hand, run heavily ; and if met with in ground where a horse can gallop at top speed for a mile or so, may often, though by no means always, be overtaken within that distance. They could not, however, be run to a standstill in such a distance, but only outpaced ; and as the horseman ranged alongside, they would swerve off and continue their flight, always making for rough ground or thick covert, where no horse can live with them.

"So far as my own experience goes, kudu never congregate in very large herds. During the rainy season and the early part of the dry season, they are usually to be met with in parties of less than ten ; and I have often come across a cow alone with her last year's calf, or two, three, or four cows together, sometimes accompanied by a bull, although the latter are usually alone. Like other antelopes, however, during the latter part of the dry season the scattered bands of kudu collect to form fair-sized, though never very large, herds. The largest number I ever saw together was on August 31, 1880, on the upper Umfuli river in Mashonaland. I first saw two old bulls,

which, on being disturbed, joined a herd of at least twenty cows, with several fine young bulls, making a herd of nearly thirty altogether. If my memory serve me right, there was not a single small calf with any of these cows ; and, as a rule, I think the latter do not commence to drop their calves till late in October. Old kudu bulls are, as a rule, met with alone, or two, three, four or five together. On many occasions I have seen the latter number consorting towards the end of the dry season ; and once I beheld eight of these magnificent creatures—all old males—in one band. This was on the southern bank of the Chobi river in the afternoon of a scorching hot day in September 1874, when I was being paddled in a canoe across the placid waters of a broad lagoon formed by the overflow from the river. I caught sight of first one, then another kudu bull, and soon counted eight ; little shooting had then been done in this part of the country, and these suspicious and retiring antelopes had come down to drink in the early afternoon. When I first saw them, they had just slaked their thirst and were walking slowly along the water's edge, one behind the other, in the shade of some tall acacia-trees, beneath which there was no bush or undergrowth to hide them from view. The wind was off the land, so, whispering to the Kafirs not to make the slightest noise, I had the canoe paddled slowly past within fifty yards of the party. As we glided silently by they halted, and stood gazing at us, their great ears cocked, and the fringes of long brown hair hanging beneath their throats moving gently in the light breeze. They were all apparently full-grown and carried splendid heads ; but three of them excelled their fellows in the latter respect, and it cost me an effort to refrain from slaying one. The picture of those eight splendid beasts standing motionless on the water's edge, beneath the tall acacias, lives with me still.

"Of all the animals I have met, I think the kudu is the most timid, inoffensive, and least capable of defending itself. I have never seen one make any attempt to use its horns in self-defence when attacked by dogs, or even kick as an eland will do at its tormentors. The bulls doubtless butt at one another when disputing for the possession of the females, but I doubt if they often do one another any serious damage."

The following abbreviated notes on kudu in East Africa were contributed by Mr. T. E. Buckley :—

"From the Zambesi northwards to Abyssinia, the distribution of the kudu is peculiar ; large areas being entirely unfrequented by this species, which is everywhere much rarer than in South Africa.

Up the Majili river, which runs into the Zambesi from the north near Shesheke, Mr. Pirie met with kudu in small numbers; while to the eastward and close to the Zambesi Livingstone mentions coming across them in abundance, although this was on the banks of the river, and the only place north of the latter where any one seems to have found them in any number. Kudu were also seen by Elton on the west side of the Shiré river, near the Lesungwe. Mr. Crawshay states that they are widely distributed through the whole of Nyasaland, especially in the rugged wooded highlands, and gives many localities where he has either personally seen them or is certain that they exist, from Cape Maclear at the south end of Nyasa, along the western shores of that lake. Farther west, in the neighbourhood of Lakes Mweru and Bangweolo, they appear to be unknown.

"Little has been written about the country between Lake Nyasa and Ujiji or Lake Tanganyika, or of the districts due east of Nyasa, so that there is nothing known about the distribution of kudu in those regions. Sir H. M. Stanley shot one in Ukonongo on the road to Ujiji; and Speke and Grant saw some in Ugojo and Ukuni in E. long. 33°; but as no other traveller seems to have met with or mentioned them from these countries, they are evidently rare and local. In British East Africa kudu are very rare and still more local. From Mombasa the first locality seems to be in the Teita district; Mr. F. J. Jackson observing that there are always a few in the Teita country west of Ndara and Kissigao, and on the banks of the Tzavo, down which the species ranges from the head-waters to the Sahàki, and then north up the Athi river. Count Teleki shot two kudu near Lake Hannington, a few miles south of Lake Baringo; and Mr. A. H. Neumann found a skull at one of his camps under the Jambeni range, at the head of the Mackenzie river, which runs into the Tana. Others were seen by the latter gentleman, as well as a good deal of spoor on the west side of Mount Nyiro, at the south end of Lake Rudolf. Dr. Donaldson Smith saw a single kudu at El Madu in about 41° E. long. and 4° N. lat. Schweinfurth never mentions having seen kudu in his wanderings among the western tributaries of the Nile; and it is doubtful if it occurs anywhere to the west of the main river. It was, however, abundant in Abyssinia, on the banks of the Settik, so late as 1878."

Of these antelopes in Somaliland Mr. J. D. Inverarity writes as follows:—

"I never saw kudu away from the Golis range, although I have observed them at the foot of those hills. I have seen their tracks

a mile or two away from the hills in the maritime plain, where they may stray during the night; but as there is far more grass and vegetation on the hills than on the plain, it is apparently not for food that they go. One bull I wounded in the hills made for the plain, and was eventually killed some way from the hills. In colour the male is iron-grey; an old one shot by myself had three white stripes down its sides, and one across its quarters. A standing mane, longest on the neck and withers, runs along the whole length of the back: it is white, variegated with black. A long fringe of black and white hair hangs down the whole length of the throat. There are three white spots on each cheek; and two white lines, one from the corner of each eye, meet on the face. The males, when young, are of the same colour as the females, viz. a yellowish brown; but they soon, I think, assume the grey coat, as I saw one with horns not more than about a foot long whose fore-quarters were grey while his hind-quarters were brown. The largest herd I saw was of twelve, one fine bull and eleven females; but the more usual size of a herd is half-a-dozen or less. A herd of females without a bull with them is often seen; and if a bull is alone, he is usually a good one. Stalking kudu is hard work; the precipitous ravines and the denseness of the thickets to which they retire soon after dawn rendering success unlikely if they keep to the same side of the ravine you are on, as it is impossible to see them. At dawn, or soon after, and in the evening, kudu may be met with on the more open flat tracts on the hills, but after the sun is well up the place to look for them is the ravines. Livingstone mentions the kudu as one of the antelopes that can exist without water. Judging from the paucity of their tracks at the water-holes in the hills, I am of opinion that Somali kudu, though they appeared to drink regularly, do not require to do so every day. The young are, I think, born about November; and I once had a young male a few days old caught in that month. When alarmed, the kudu bark loudly, the sound being similar to that of sambar. The meat is good, the Somalis preferring it to that of any other antelope."

Whether kudu from South Africa exhibit any colour-change corresponding to that noticed by Mr. Inverarity in the Somali representatives of the species, I have been unable to ascertain. Probably, however, the change is confined to the northern race, as the southern one is never distinctly grey.

Female kudu, it may be added, occasionally develop horns; but these are generally more or less deformed, and have a closer spiral than those of males. In one such female the left horn is directed

upwards and inwards, while the right grows almost perpendicularly downward, each having four complete spiral turns.

THE LESSER KUDU

(*Strepsiceros imberbis*)

Anderio, OR SOMETIMES *Godir*, SOMALI ; *Gadams*, GALLA ; *Kungu*, SWAHILI ; *Sara*, ABYSSINIAN

(PLATE xiii, fig. 2)

An even more graceful and brightly coloured antelope than its larger relative, the lesser kudu was named *imberbis* in the *Proceedings* of the Zoological Society for 1869 by the Indian naturalist Edward Blyth, in allusion to the absence of a tuft of long hair on the throat, which forms one of its chief characteristics. In addition to its inferior size (shoulder-height about 41 inches) and this absence of a throat-tuft, the species is distinguished from the true kudu by the presence of two white bands on the throat, its narrower ears, and the greater number (thirteen or fourteen) of stripes on the body. The general colour is a rich rufous fawn, deeper even than in the southern race of the greater kudu ; and the horns of the bucks are less divergent and form a closer spiral than in the latter. The weight is about 230 lb., and the record horn-length 35¼ inches.

The species is restricted to north-eastern Africa, where it ranges from Somaliland to British and German East Africa. According to Mr. J. D. Inverarity, lesser kudu are found in fair numbers along the foot of the Golis range, and in the thick bush fringing the numerous streams of the low ground of Somaliland in the neighbourhood of the mountains. As a rule, they are to be found near water where the jungle is dense, especially where there is a thick growth of aloe. In making his way through jungle of this description, the sportsman is apprised of the presence of his game by the sound of a loud bark and a longer or shorter glimpse of a bright fawn hide with conspicuous stripes. Indeed, these antelopes are by no means shy, and will frequently permit an approach within a few yards before they take flight. They are not gregarious animals, a buck and doe, or four or five does, being commonly seen in company. Young fawns are to be seen in November and December.

As mentioned by Mr. R. I. Pocock in the paper cited under the heading of the greater kudu, it is not a little remarkable that the lesser

kudu, which is the most fully striped representative of the whole group, occurs in the same districts as the least striped race of the former. As the colouring of all the members of the tragelaphine subfamily is almost certainly protective, this implies a difference in the habitat of the two species in question, so far at least as Somaliland is concerned.

On this point Mr. Pocock, after referring to the imperfect information at present available, writes as follows :—

"Nevertheless, Selous's statement that the South African kudu, although usually partial to hilly country covered with dense thickets, is also common in the thick bush along both banks of the river Chobi, where there are no hills whatever, and Kirby's corroboration to the effect that in the heavy belts of bush lining the rivers and watercourses these animals are as much at home as in rocky bush-covered hills, are very much to the point, since they testify that the habitat of the greater kudu of South Africa embraces the habitats of the two forms that occur farther north in the continent. Hence, if there is any truth in the theory that the markings of these antelopes are correlated with habitat, we should expect to find the markings of the southern form of the greater kudu intermediate between those of the northern form of the same species and of their smaller but more beautiful ally *Strepsiceros imberbis* ; and this seems to be the case."

In other words, the lesser kudu, on account of its full striping and rich body-colour, would naturally be expected to occur in dense lowland jungle ; whereas the Somali greater kudu, as being but sparsely striped and of a greyer tone of colouring, should be looked for in mountainous and less bushy country. Both suppositions agree with the actual facts of the case. Finally, the South African kudu, as being of an intermediate type of colouring, ought to occur in both kinds of situation ; and in this case also theory appears to be supported by actual fact.

THE GIRAFFE

(*Giraffa camelopardalis*)

Kameel, CAPE DUTCH ; *Näip*, HOTTENTOT ; *Tutla*, BECHUANA ; *Ntutla*, MATABILI AND ZULU ; *Ng'habi*, MASARWA ; *Njangitomara*, NDOROBO ; *Twiga*, SWAHILI.

(PLATE xiv, figs. 1-3)

The giraffes and the okapi are the sole living representatives of an African family of ruminants (*Giraffidæ*) distinguished by the double-

lobed crowns of the outermost of the four pairs of lower front teeth, corresponding to the canines of carnivorous mammals (fig. 67). They are further characterised by the curiously rugose nature of the enamel of all the teeth, which recalls that of the skin of the common large black slug. The horns, again, which may be present in both

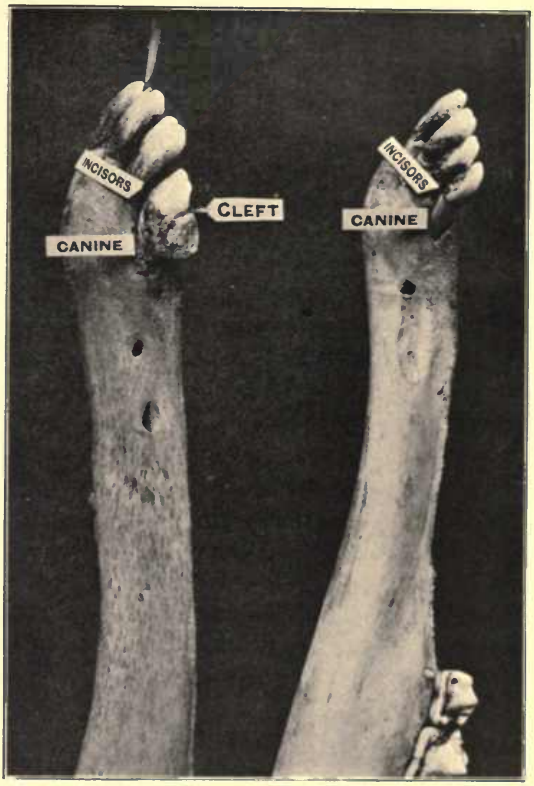


FIG. 67.—Lower Front Teeth of Giraffe (A) and Elk (B), to show the difference in the form of the canine.

sexes, or only in the males, are short and covered with skin in the living representatives of the family, although at their tips they may have a small bare bony cap, comparable to the antler of a deer. Another feature common to giraffes and okapis is the complete absence of lateral hoofs, but as the same condition obtains in the pala antelope, it cannot be regarded as a characteristic of family value. Other distinctive features are to be found in the skeleton; but as those

already cited are sufficient to distinguish the family from the hollow-horned ruminants (*Bovidæ*) on the one hand, and from the deer (*Cervidæ*) on the other, nothing would be gained by referring to them in detail on the present occasion. It may, however, be well to mention that although the family is now confined to Africa south of the Sahara, it was represented during the latter portion of the Tertiary period in southern and western Europe and throughout a large extent of Asia.

Giraffes—the tallest of all mammals—have a pair of conical horns covered with skin on the crown of the head, a shorter horn in the middle of the forehead, and in some cases a pair of rudimentary horns at the hind extremity of the skull. The young have tufts of hair in place of the paired horns, and a dark patch of hair where the middle horn subsequently grows. Although somewhat narrow, the ears are rather large; the muzzle is broad and hairy, with slit-like nostrils which can be closed at will; face-glands are present, and the tongue is long and extensile. The neck and withers are maned, and the tufted tail reaches about to the hocks. The blotched or network type of colouring—quite unlike any met with either in the *Bovidæ* or the *Cervidæ*—may be cited as another distinctive feature of the genus. The upper cheek-teeth have short and broad crowns. In addition to unusual lightness, the skull is remarkable for the elevation of the front plane of the forehead and face above the eyes, and likewise for the large size of the unossified space behind the nose-bones.

Giraffes are to be found, in suitable localities, over the greater part of southern and eastern Africa as far north as Kordofan and Nubia; in Central Africa they are known to occur in the Lado district and farther south in the heart of Congo territory; while on the western side of the continent they have been recorded from Angola, southern Nigeria, and the Lake Tchad district. With such an enormous geographical range, it may be taken for granted that giraffes must exhibit a considerable amount of local variation—either racial or specific. As a matter of fact, it has for many years been known to naturalists and sportsmen that giraffes from different parts of Africa display considerable variation as regards markings, colour, and the degree of development of the median horn on the forehead, which may indeed be practically absent; and distinct specific or subspecific names have been from time to time assigned to these local forms. It is, however, only recently that anything definite with regard to the distinctive characteristics and range of these variations has been recorded, and even now our information on this subject is very far from complete.

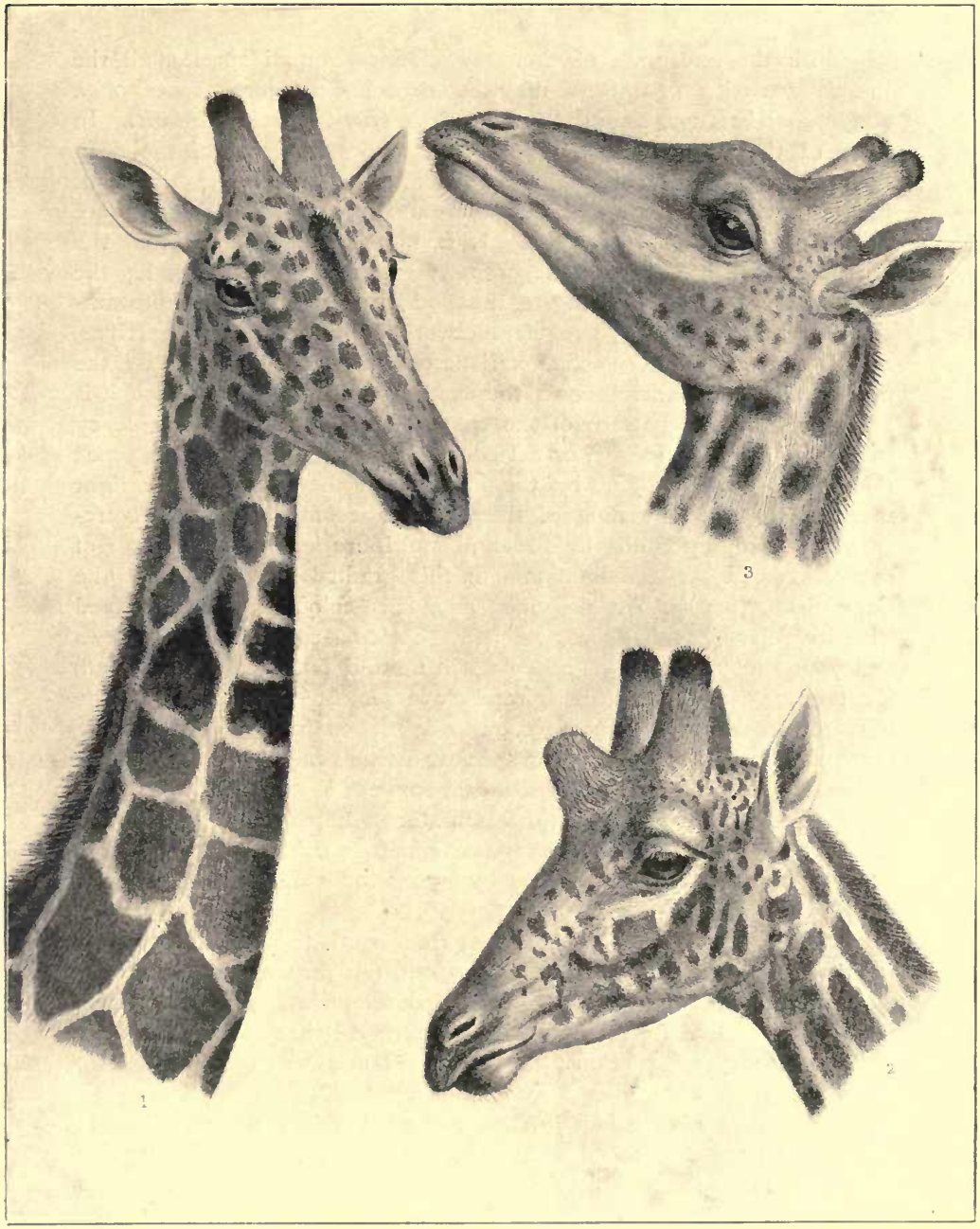


PLATE XIV

1. Somali Giraffe. 2. Baringo Giraffe. 3. Southern Giraffe.

With the exception of the very distinct Somali species, all the known varieties of giraffe may be regarded as local races of a single specific type, technically known as *Giraffa camelopardalis*. In none of the phases of this species are the dark areas of the deep liver-red tint characteristic of the Somali animal, while the light markings never form such a distinct and coarse network, and are usually tawny instead of white. It is, however, noteworthy that the northern or typical form of the ordinary giraffe is the one making the nearest approach in colouring to the Somali species, being a chestnut-coloured animal with an irregular network of light markings. It has, moreover, the three horns characteristic of the Somali species. On the other hand, as we travel down the eastern side of the continent, it is noticeable that the pattern of the colouring shows a gradual tendency to pass from the reticulate, or netted, to the spotted, or blotched, type; this being brought about by the increase in the width of the light markings and a darkening of their colour, accompanied by a corresponding diminution in the size and multiplication in the number of the dark areas. The culmination of this gradual change is that the Cape giraffe may be best described as a fawn-coloured animal marked with irregular dark blotches, which are chestnut-coloured in the cows and young males, but deep chocolate in the old bulls. Nor is this all, for the males of the Cape giraffe have almost completely lost the unpaired frontal horn so conspicuously developed in all or most of the northern and eastern races of the species; neither have they any distinct traces of the small back-horns found in some of the eastern races.

As these local gradations in the matter of horns and colouring are of very considerable interest, it may be well, at the risk of some repetition, to quote from a paper contributed by myself to the Zoological Society's *Proceedings* for 1904:—

"Firstly, we notice as we proceed from south to north the gradual passage of a two-horned animal into one (so far as the males are concerned) with three horns. But the development is by no means simply progressive, for we find in the eastern districts of the continent a tendency to the formation of a five-horned, and even of a six-horned, race.

"Secondly, proceeding in the same direction, a transition is observable from a blotched animal (that is to say, one with irregular dark chocolate-coloured blotches on a tawny ground) with dark legs spotted down to the hoofs, to one in which the markings take the form of a white or buffish network on a chestnut or liver-coloured ground, while the lower portion of the legs becomes unspotted white;

the culmination of this type being presented by the Somali *G. reticulata.* Here, however, as in the case of the horns, the progression is by no means regular, since we find in East Africa a strong tendency to the development of a star-like type of coloration. Indeed, it would seem that in this part of the continent giraffes have, so to speak, got completely off the line, and run riot, both in the matter of coloration and horn-development.

"By no means the least noteworthy feature in regard to the change of the type of coloration in giraffes as we proceed from South to North-east Africa is that it is precisely the reverse of that among the

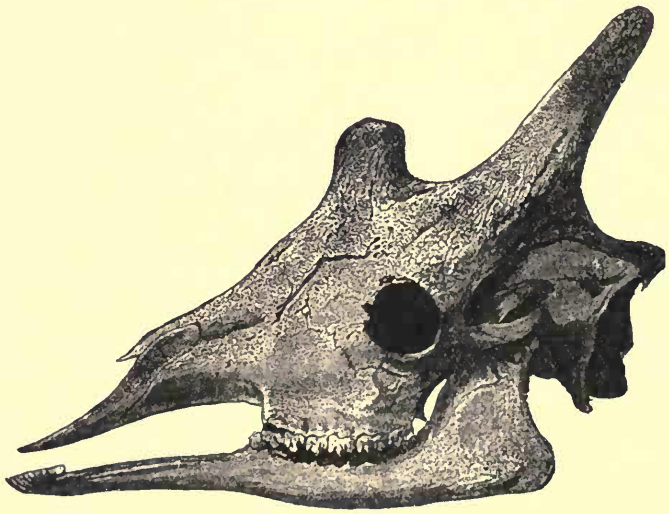


FIG. 68.—Skull of Nubian Giraffe (from de Winton, *Proc. Zool. Soc.* 1897).

quaggas and bonte-quaggas. That is to say, that whereas among the various races of giraffe the general colour lightens and the legs pass from spotted to pure white as we go from south to north, among the local forms of *Equus burchelli* the stripes on the legs, under-parts, and hind-quarters, which are fully developed in the northern types, such as *E. b. granti*, have disappeared more or less completely in the southern forms, the supreme development in this respect being reached by the true quagga."

The first local representative of the species is the Nubian race (*G. c. typica*) of upper Nubia and Abyssinia, which agrees with several of the other northern races in the presence of a large frontal horn in the bulls, and by the fore-legs being white and unspotted

from the knees downwards, as well as by the occasional presence of spotting on the front of the face. In this particular race the sexes are nearly or quite alike in respect to the form and colour of the markings. Spots large, apparently chestnut-coloured at all ages, more or less distinctly quadrangular in form, and divided by a coarse network of comparatively narrow light lines, which are buffish white in immature bulls, and nearly white in cows of same age. Front of face in bulls somewhat spotted, and sides fully spotted. No prominent occipital (posterior) horns.

In an immature male figured in the paper cited a notable feature is a row of five large spots, of which the first is partially divided, extending from just below the point of the shoulder in a curved line to the middle of the back. On the outer side of the fore-limb the spots extend well down to the knee, and in the hind-limb a considerable distance down the cannon-bone. The under-parts are comparatively free from spots, as is the inner surface of the upper segments of both limbs. In a female the spots were smaller and more numerous, this being especially noticeable on the hind-quarters and the upper part of the fore-legs. Correlated with this is the greater width of the light interspaces, which are nearly white on the greater part of the body. Faint spotting occurs on the belly and the fore part of the inner surface of the front legs.

Nearly allied to the last—from which it is easily distinguishable by the circumstance that in the fore-limb from just above the line of the abdomen, and on the hind-limb halfway up the thigh, the spots suddenly break up into a series of very small spots of irregular shape, similar spots occurring on the under-parts and inner side of limbs—is the Kordofan race (*G. c. antiquorum*). The horns are as in the Nubian giraffe. Indeed, so close is the Kordofan to the Nubian giraffe, that had not the former been named years ago by Colonel Hamilton Smith, it is doubtful if I should have admitted its claim to distinction.

Another nearly related race is the Nigerian giraffe (*G. c. peralta*), originally named by Mr. O. Thomas in the Zoological Society's *Proceedings* for 1898, p. 40, on the evidence of a skull and limb-bones from the neighbourhood of Locoja, at the junction of the Benue with the Niger, but more fully described by myself in the same serial for 1905 (vol. i. p. 119) from the skin of a bull obtained in Nigeria during the Alexander-Gosling expedition.

The latter specimen, which indicates a fully adult although not very old animal, shows that the Nigerian giraffe belongs to the northern group in which the bulls have a large median horn, and the legs in

both sexes are white, or nearly so. When describing the skeleton of the type female, Mr. Thomas was of opinion that the lengths of the skull and of the hind cannon-bone indicated an unusually tall race. This, however, is not borne out by the corresponding bones of the male. The skull of the latter is, for example, not markedly larger than that of a Nubian giraffe of the same approximate age ; while the hind cannon-bone is practically the same length as in the type female skeleton, and both are scarcely longer than the corresponding bone in a skeleton of a male Nubian giraffe in the British Museum. The skull shows no marked difference from that of the Nubian giraffe, with which it agrees in the comparatively slight development of the rudimentary occipital horns. The main horns are smaller and more slender, and the ridge between them is perhaps somewhat less elevated ; while the anterior horn is remarkable for the length and rugosity of its base. As regards colouring, the most striking feature of the Nigerian giraffe is its paleness, especially on the head and neck. This paleness is much more marked than in even immature bulls of the Nubian race, and the whole head may be said to be whitish, relieved by pale fawn spots on the side of the face below the line of the eye, and by a dash of still paler (sandy) fawn on the forehead and the middle line of the face. Two irregular blotches of darker fawn immediately behind each nostril are conspicuous : these also occur in the Nubian giraffe, but agree in colour with, and are joined to, the darker fawn of the middle line of the face.

The pale-faced, or white-faced, giraffe would be a better name for this race than *peralta*, which is misleading.

On the neck the blotches are somewhat darker fawn on a whity-brown ground. These blotches are very large, few in number, and separated by wide interspaces, so that the pattern can scarcely be described as of the " netted " type. In shape the blotches are irregular and elongated, and at their edges shade almost imperceptibly into the ground-colour. They are different in size and disposition from those of the Nubian giraffe. The occipital region is white, with a few large spots ; and below the ears is a large fawn blotch covering an area which in the Nubian giraffe is white, and in all other giraffes marked with small spots.

As regards the body-skin, the spots on the back are pale chestnut-brown, with trefoil-shaped dark brown centres. Towards the hind-quarters the colour of the spots gradually lightens, and on the hind-limbs it becomes very pale fawn. The spots on the back are darker than in a male of *G. c. typica* shown in *Proc. Zool. Soc.* for

1904, vol. i. pl. ix., but such a difference may be mainly due to the immaturity of the latter. A constant distinction between the two races would appear to be the much greater number of the spots on the back and flanks of *peralta*, these spots becoming much broken up on the thighs. The spots are divided by a light network, of which the strands are much broader on the fore than on the hind quarters. On the hind-quarters the colour of the network is whity brown, but it darkens anteriorly.

The Nigerian giraffe is thus nearly allied to the Nubian race, from which it is distinguished by its generally paler colour (especially on the head) and more numerous and differently arranged spots. The distinctness of this pale-coloured giraffe from other representatives of the group is thus sufficiently apparent. The contrast is greatest between this race and the Baringo or "black giraffe," in which the bulls are extremely dark. It would be interesting to ascertain whether the countries respectively inhabited by these two races present features which would accord with these distinct types of colouring.

Very distinct is the Baringo giraffe (*G. c. rothschildi*), from the Lake Baringo district and thence eastwards to Mount Elgon, both of which localities lie less than 1° north of the equator. This is a three-horned giraffe in which the sexes, in the early adult condition at least, are markedly different as regards both the form and the colour of the spots, with the lower part of the legs pure white and unspotted, a triangular white area in the neighbourhood of the ear, the spots in adult bulls large and very dark-coloured, showing a tendency to split up into stars, as indicated by lighter tripartite radiating lines in the larger ones, and the light interspaces yellowish fawn, forming narrow network-lines on the body, but becoming much broader on the neck, where the spots assume a more irregular and somewhat jagged contour. Above the knees and hocks the spots are chestnut, these chestnut spots extending higher up on the hind than on the fore limbs. Sides of face fully spotted with black. In females the spots are much more irregular, jagged, and star-like, and are reddish chestnut in colour upon a light orange-fawn ground. The light areas on the neck are very wide, and the spots on the legs very small, while the white area round the ear is small; and the sides of the face are sparsely spotted.

Five horns are generally or invariably present in old bulls, owing to the development of the posterior, or occipital, pair.

The type specimen of this race is a mounted adult bull in the British Museum, shot by Major P. H. G. Powell-Cotton on the

Quashengeshu (pronounced Uashengeshu) plateau to the east of Lake Baringo, from which it is separated by a forest-clad mountain-range. The mounted head and neck of a "five-horned" bull giraffe in the British Museum (fig. 69) brought from Mount Elgon by Sir H. H. Johnston doubtless belongs to this race. It is true that the whole colour is much darker, the white area below the ear smaller and less distinct, and the spotting on the face much less developed; but in another specimen from the same locality, figured by Sir H. H. Johnston in *The*

FIG. 69.—Head of Bull Baringo Giraffe from Mount Elgon.

Uganda Protectorate, these features are much the same as in the type. The presumed female of this race is a specimen in the British Museum killed by Major Powell-Cotton near Lake Baringo. As I am informed that bulls precisely similar to the type Quashengeshu specimen occur with the Lake Baringo herd, and as this statement is confirmed by a male skin from that district I have had the opportunity of inspecting, there seems every reason for associating the female with the present race. The marked discrepancy in the coloration of the two sexes is therefore a very distinctive feature of this race at this age. I am,

however, informed by Sir H. H. Johnston that a very aged female shot in the Elgon district was remarkable for its exceedingly dark colour. So dark, indeed, was this animal, that at a distance it appeared quite a uniform sepia-tint. This indicates that the mounted female in the British Museum, although full grown, is a comparatively young animal. When seen through field-glasses by Sir H. H. Johnston's party, both males and females of this race of giraffe were often so dark in colour that they appeared to be nearly black, with white bellies and legs; this deepening of coloration being apparently coincident with advanced age.

The South Lado giraffe (*G. c. cottoni*), inhabiting that portion of

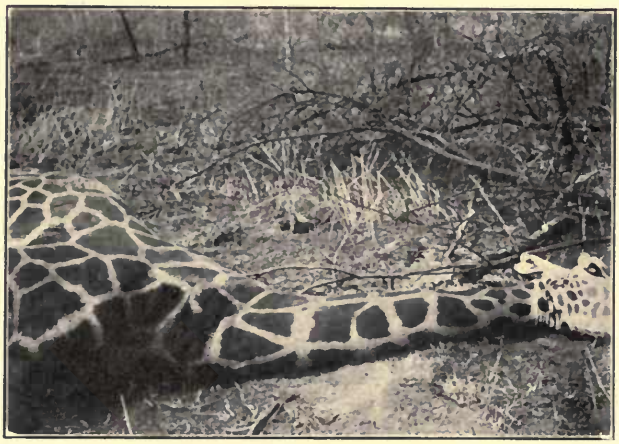


FIG. 70.—Bull Lado Giraffe shot by Major P. H. G. Powell-Cotton to the southward of Lado.

the interior of Uganda lying immediately south of Lado, which is itself 5° north of the equator, is represented by the mounted head and neck of a male shot by Major Powell-Cotton on March 15, 1903, on Koten plain, at an elevation of 2550 feet. Koten lies to the extreme south of the Topora (Doborsa of the maps) country, and is about 3° 50′ N. by 34° 30′ E. It might have been called the Topora (or Doborsa) giraffe, but it was preferred to associate it with Lado as being a better known locality, despite the fact that the latter is generally connected with the Congo side of the Nile. This giraffe is apparently closely related to the Baringo race, from which the male differs in the following points:—

The spots on the neck are deep chestnut-brown instead of black,

and show no tendency to split up into smaller spots by the development of lighter lines radiating from the centre. The spots are also of more regular and more squared form, those on the lower part of the neck being so arranged that the fawn-coloured interspaces form continuous transverse bands. In *G. c. rothschildi*, on the other hand, the spots on the neck of the male are arranged somewhat alternately, so that no such transverse light bands can be traced.

The spotting of the face is confined to an area lying considerably below a longitudinal line drawn through the eye. The spots between the eye and the ear are smaller, and do not extend upwards on to the horns; while the hind aspect of the horns and the portion of the crown of the head below them are likewise devoid of spots, although fully spotted in the Baringo race. The white area on the side of the head is also much smaller and much less conspicuous than in the type male of the latter. Moreover, the spots on the under surface of the head are much less numerous, and (like the sides of the face) brown instead of black. There are also much smaller spots on the nape of the neck. So far as can be determined, the spots on the shoulder are smaller than in the typical male of the Baringo race, none approaching in size the few large ones characteristic of that animal. On both sides of the upper part of the fore-leg the spots are markedly smaller and more numerous than in the latter; while on the front and inner sides they are pale fawn, instead of being, as on the outer side, black.

The main horns are decidedly smaller than in the males of the Baringo giraffe, and the development of the posterior horns is also somewhat less. In the skull of the type specimen, the right main horn is larger than the left horn. A more remarkable feature is the presence of a horn on the right side of the head, which is, however, wanting in a second specimen from the same locality.

As already mentioned, the general characteristics of this giraffe affiliate it closely to *G. c. rothschildi*, but the resemblance of the second head and neck (in the collection of Major Powell-Cotton) to the type seems to render its right to distinction fairly good.

With the Kilimanjaro giraffe (*G. c. tippelskirchi*) we come to a race in which the lower part of the legs—especially the hind pair—is more or less spotted and dark-coloured, at any rate in immature animals. This race is typically from Lake Eyassi, to the south-west of the Victoria Nyanza, but extends due westward to the neighbourhood of Mount Kilimanjaro, in about lat. 3° south of the equator, and also the Masai country, a little farther north. Probably

it occurs to the southward in Portuguese East Africa. This race is a lighter-coloured three-horned giraffe than *G. c. rothschildi*; the sexes being nearly alike in the form and colour of the spots, the lower part of the legs (at least generally) more or less spotted and either whitish or olive-coloured. The spots in both sexes are irregular and jagged in contour, often displaying a distinctly star-like shape.

The type specimen of *tippelskirchi* is a young female skin brought to Berlin by Mr. Tippelskirch from Lake Eyassi, and characterised by the dark forehead, olive-coloured and spotted legs, and the very narrow and serrated white lines dividing the spots, the latter feature being evidently due to immaturity. A somewhat older skin, brought by Mr. Ramsay from German East Africa, was regarded by Dr. Matschie as closely allied, but, owing to the lower part of the legs being white, was not definitely assigned to this race. Another so-called race (*G. c. schillingsi*) has been named by Dr. Matschie on the evidence of an adult female skin obtained by Mr. Schillings from the Kilimanjaro district. It is characterised by the white, unspotted legs, the light forehead, sparsely spotted cheeks, and the jagged, irregular, and somewhat star-like form of the chestnut spots, which are widely separated on the neck. A skin from German East Africa mounted in the museum at Karlsruhe has been identified by Dr. Matschie with his *schillingsi*, and agrees with the type in all essential characters, except that the legs are distinctly spotted for some distance below the knees and hocks. On the other hand, a mounted skin in the Stuttgart Museum brought by Mr. Schillings from Masailand is referred by Dr. Matschie to *tippelskirchi*. With the exception that the legs are more fully spotted below the knees and hocks, and the sides of the face are likewise more spotted, while the forehead may be darker, the specimen has all the characters of *schillingsi*, and in my opinion cannot be separated from that form.

Decisive evidence of the unity of the two forms is, however, afforded by the skin of the fore-legs and withers of a male from Kilimanjaro presented to the British Museum by Mr. Rowland Ward. In this skin, which has jagged and somewhat star-like chestnut spots of the character of those of the so-called *schillingsi*, the lower part of the fore-legs is fawn-coloured, and spotted almost or quite down to the hoofs, after the fashion of the type of *tippelskirchi*. In other words, we have a *tippelskirchi* from the typical *schillingsi* locality, which seems sufficient to show that the two are identical.

The British Museum possesses a mounted female of the Kilimanjaro race from British East Africa, presented by Mr. T. F. Victor

Buxton. The spots on the body are of the characteristic jagged type, with the intervening network pattern very narrow. On the neck the spots are of considerable size, with wide intervals between; but they decrease in size and become more approximated on the body, and on the limbs they are very numerous. They cover nearly the whole of the inner surface of the thighs and both sides of the limbs as far down as the fetlocks. On the lower part of the legs the ground-colour is olive-fawn, but on the upper portion of the fore-legs and shoulders it passes into whity brown; while on the last few inches of the neck and the whole of the sides of the face the ground-colour is white. The spots on the sides of the head are blackish brown, but they are elsewhere some shade of brown-fawn, darkest on the back and gradually

FIG. 71.—Bull Kilimanjaro Giraffe shot by Mr. Frank Baden-Powell in British East Africa.

paling on the legs. They nowhere show dark centres. There is no trace of a third horn, but this is probably merely a characteristic of the female.

Mr. Buxton's specimen emphasises the marked distinctness of the Kilimanjaro giraffe from all the other races of the species. This race is indeed the most beautiful of all the giraffes, and especially characterised by the fulness of its spotting.

That a third horn is developed in this race seems to be demonstrated by sketches of a head and skull, together with certain notes, made some years ago by Mr. Vaughan Kirby in Portuguese East Africa. These sketches show the head and neck of a male giraffe, having the type of coloration characteristic of the present race, and carrying a well-marked third horn on the forehead. At the same time

this third horn seems to be decidedly smaller than in *G. c. rothschildi*; and it appears from Mr. Kirby's notes that some of the bull giraffes from the same locality have little or no third horn. This accordingly demonstrates that in Portuguese East Africa a giraffe, closely allied to and probably identical with *G. c. tippelskirchi*, is tending towards the southern type in the characters of the skull, as is the typical *tippelskirchi* in the coloration of the limbs.

In 1907 Mr. Frank Baden-Powell brought home the skin of the first adult bull of the Kilimanjaro giraffe ever received in England. The animal (fig. 71) was killed about sixty miles east of the Victoria Nyanza and one hundred miles west of Nairobi. As Nairobi is close to Lake Eyassa, where the type specimen was obtained, there can be no doubt as to the variety to which Mr. Baden-Powell's giraffe belongs. Fortunately a good photograph was obtained immediately after the animal was shot. From the female in the British Museum Mr. Baden-Powell's specimen differs by the more sparse spotting of the head, the much more jagged or starred form of the spots on the neck and body, and the white unspotted lower segment of the limbs. The Baringo giraffe is known to be less heavily spotted on the head in fully adult bulls than in younger animals, and the presence of spots on the lower part of the legs of the Kilimanjaro race, and their disappearance in the adult, is probably a feature analogous to what obtains in lions, in which the cubs are always spotted, while the adults are generally self-coloured. If this be so, the southern giraffe, in which the legs are always spotted, will be the original form of the species. The front horn in Mr. Baden-Powell's specimen appears to be small.

The Congo giraffe (*G. c. congoensis*) from Katanga, Congo Free State, is typified by an adult mounted bull in the Congo Museum at Tervueren, near Brussels; and is specially characterised by the well-developed frontal horn, coupled with the full spotting of the lower portion of the limbs (especially the hind-pair), of which the ground-colour is grey-fawn, and the large size and subquadrangular form of the body-spots, which show no tendency to split up into stars. From the presence of a well-developed frontal horn, this giraffe is clearly allied to the northern and eastern races of the species; but, on the other hand, it resembles the South African race (*G. c. capensis*) in having the hind-legs spotted right down to the hoofs; the fore-limbs also displaying the same feature, although less distinctly. The sides of the head are much more fully spotted than in the Cape form, and the tail is remarkable for the great fulness of its terminal tuft. In the spotting of the legs this giraffe resembles most specimens of

G. c. tippelskirchi, although the dark markings show no trace of the ragged and star-like form characteristic of that race.

In all the remaining races of this species the frontal horn is rudimentary; and the limbs are more or less fully spotted to the hoofs. The first of these races is the Angola giraffe (*G. c. angolensis*), which is typified by a mounted male in Mr. Rothschild's Museum at Tring (fig. 72), from the Cunene river, 150 miles south-west

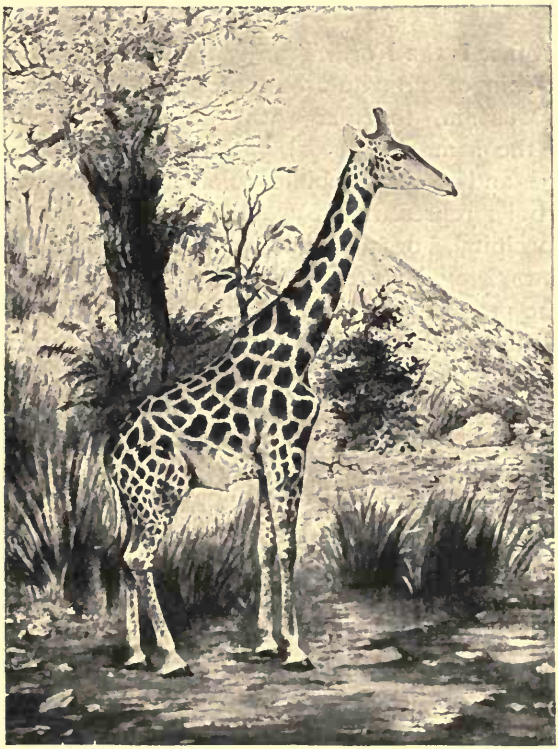


FIG. 72.—The Angola Giraffe.

of Humbe. The markings are more of the network type than in *G. c. capensis*. The spots on the face are confined to an area lying below a longitudinal line running beneath the eye to the angle of the mouth; and there is a small and indistinct triangular area below the ear in which the ground-colour is white. The body-spots are large, with ill-defined margins, and brown in colour; but there is a sudden break into smaller spots about the middle of the thigh. The ground-colour is white or whitish; and the legs are fully spotted to the hoofs,

with the ground-colour of their lower portion tawny. The frontal horn is represented by a low tuberosity or swelling.

This race differs from the southern giraffe, as represented by an old bull formerly exhibited in the British Museum, by the lighter ground-colour, the more net-like type of coloration, the browner colour of the spots, and the greater degree to which the latter extend on to the sides of the face.

Whether posterior horns were developed, I have been unable to ascertain.

The ninth race is the North Transvaal giraffe (*G. c. wardi*), typified by the body-skin of an adult bull presented by Mr. Rothschild to the British Museum, together with the skull and mounted head and neck of the same individual presented by Mr. Rowland Ward. It is a large and dark chocolate-coloured giraffe, with the frontal horn in old bulls represented by a low irregular boss (fig. 73), the posterior, or occipital, horns enormously developed, and the body-spots broken up into irregular stars, recalling those of *G. c. tippelskirchi*, from which the present race (apart from the absence of a frontal horn) is broadly distinguished by the dark chocolate-brown, instead of chestnut, colour of the body-spots. The stellate character of these spots widely distinguishes this race from the Cape giraffe, between which and the East African *G. c. tippelskirchi* type it constitutes, however, a connecting link. So far as can be ascertained, the habitat of this giraffe is quite isolated. The skull is remarkable for the extraordinary development of the posterior, or occipital, horns, which are much larger than in the Baringo giraffe; and in possessing these appendages the present race presents a marked contrast to the Lado and the Cape races, in which they are wanting. The presence of posterior horns, coupled with the abortion of the front horn, is thus a distinctive feature of the present form, which might be called the four-horned giraffe.

Lastly we have the southern race (*G. c. capensis*), from the country immediately north of the Orange river and some of the adjacent districts, of which the typical southern form is probably extinct. This is a large dark-coloured giraffe, without posterior horns, displaying the 'blotched type' of colour-pattern in the most pronounced form, with the two sexes alike as regards the pattern of the spots, but the old bulls darker than the cows. As regards the spots, the large chocolate-brown, or almost black, body-spots of the old bulls are more or less quadrangular in shape, without showing any tendency to split into stars, and form conspicuous dark blotches upon a tawny ground. This type of colouring is thus the reverse of that of the Nubian race.

The legs are fully spotted and dark-coloured throughout, and the

FIG. 73.—Head and Neck of Transvaal Giraffe.

frontal horn is rudimentary. It appears that the typical blotched coloration is displayed in its most characteristic form only in the more

southern representatives of this race, which is probably now almost or quite exterminated. In the head and neck of a young and light-coloured bull from the North Kalahari, presented to the British Museum by Mr. Bryden, there is a decided tendency towards the netted type of the Nubian race.

A coloured figure of the true southern giraffe is given in plate xi. of Sir Cornwallis Harris's *Portraits of the Game and Wild Animals of South Africa*, which may be considered a fairly correct, although perhaps somewhat highly coloured, portrait of the animal. According to this, the ground-colour of the skin is bright orange-fawn, upon which are large widely separated blotches, with ill-defined borders and the centres markedly darker (deep chestnut) than the margins. On the upper part of the limbs the spots tend to become somewhat irregular and jagged in outline, and they gradually decrease in size as the hoofs are approached. A white area is shown on the sides of the head and neck below the ear.

As regards the height attained by giraffes, 18 feet 7 inches appears to be the maximum record based on actual measurement, although it is quite probable that statements as to the occurrence of specimens of 19 feet may be perfectly true.

Although giraffes are still to be met with in greater or less abundance in many parts of East and East Central Africa, both in British and in German territory, as well as farther north in Kordofan and Nubia, they have long since disappeared from the greater part of South Africa, where they were formerly common in the country lying between the Orange and the Zambesi rivers. Doubt has, indeed, been expressed whether the species ever ranged to the southward of the Orange river, despite a tradition among the Hottentots as to the occurrence of these animals in the Amaebithorn district in the Queenstown province of Cape Colony. In view of this tradition it seems a decidedly bold step to affirm that giraffes never existed south of the Orange river. Be this as it may, no giraffes have for many years been found on the eastern side of the continent to the southward of the north-eastern districts of the Transvaal, and even there they are probably very scarce at the present day.

In other districts, such as Portuguese East Africa, Matabililand, Mashonaland, Khamaland, and the northern Kalahari, giraffes have, however, held their own, at all events until quite recent times; while in the desert tracts of the northern part of the Kalahari they are likely to survive for many years. Throughout this part of the Kalahari, as has been already mentioned in the present volume, there is no permanent

water-supply, so that for some six or seven months, inclusive of the African winter, the giraffes, like many antelopes, must subsist each year without water. Despite its dryness, the country carries a scattered forest of acacia, upon the leaves of which they subsist. Since no mention appears to be made by those familiar with the country of giraffes eating water-melons, it would seem that they are independent of liquid of any kind; and if this be really the case with these animals, there is no reason why it should not hold good with regard to antelopes. In the opinion of a well-known sportsman, it is probable that previous to the introduction of firearms giraffes were much more frequently to be found on open plains, on their way from one piece of forest to another, than is the case at the present day.

In many parts of Central and East Africa giraffes must necessarily be stalked on foot, and as they are some of the shyest and most wary of all game, while their lofty stature endows them with an enormously wide field of vision, their pursuit demands great skill and caution on the part of the sportsman. In the territories immediately north of the Orange river giraffe-hunting in the early days of South African sport was, however, carried out on horseback; and there is abundant testimony as to the excitement of a tail-on-end chase after a troop of these gigantic quadrupeds. As Mr. H. A. Bryden well observes: "The first sight of a troop of wild giraffe is certainly one of the most wonderful things in nature. The uncommon shape, the great height, the long slouching stride, the slender necks, reaching hither and thither among the spreading leafage of the camel-thorn trees, the rich colouring of the animals—all these combine to render the first meeting with giraffes in their native haunts one of the most striking and memorable of experiences."

But, as the same writer also observes, the sport is apt to pall even on the most enthusiastic of British sportsmen; for, after all, a giraffe yields little in the way of satisfactory and easily preserved trophies, and to continue a senseless slaughter of these beautiful creatures is in truth but little short of murder. No such compunction seems, however, to have affected the skin-hunters—whether white or black—to whose incessant persecution is attributed the extermination of the giraffe from large portions of its original habitat. In Africa itself the value of a giraffe-hide ranged, some years ago, between £4 and £6; the chief local uses being for *sjamboks* (whips) and native sandals.

Giraffes when at their ordinary pace move the two limbs of each side simultaneously, and are in this unlike most ruminants, whose legs are moved in alternate pairs. This gives a peculiar movement quite

different from that of a horse or antelope. If not pressed beyond their normal pace—which may be either a wonderfully rapid walk or an awkward-looking kind of gallop—giraffes have great staying power ; but if hustled beyond this, they are soon tired and blown. Accordingly, it is the business of the hunter to force the pace as much as possible at the beginning, and to get up with the herd within two or three miles. If he fail in this, his horse, or pony, will inevitably be beaten. That such tall animals should be able to penetrate quite thick scrub-jungle without difficulty may seem incredible, and yet there is abundant testimony to

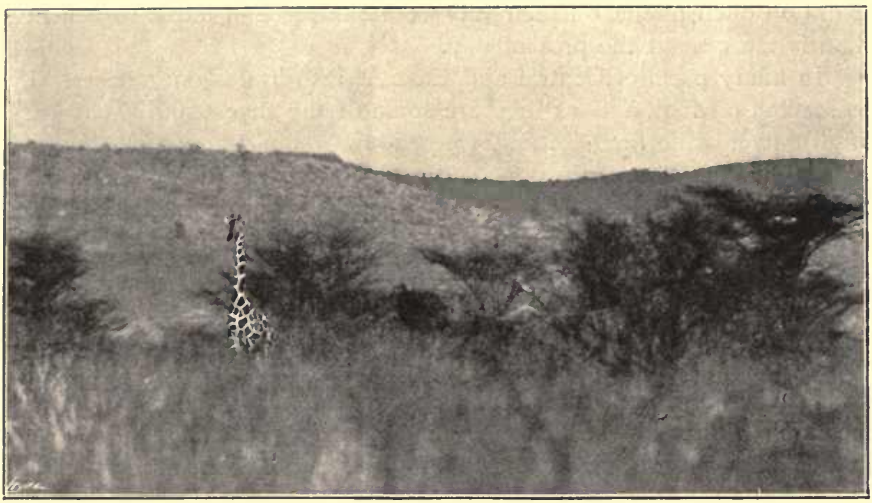


FIG. 74.—Bull Somali Giraffe, photographed by Lord Delamere in the Rendite district, north of Gwaso Nyiro.

the effect that, owing to the thickness of their hides, they burst through all such obstacles with the greatest ease, skirting tree-trunks with a sudden swerve, and bending their long necks beneath branches with surprising skill and swiftness.

Giraffes are essentially browsing animals, and can only graze or drink by straddling the fore-legs wide apart in an extremely ungainly attitude. Leaves are stripped from the branches by means of the long flexible tongue and the protruding and partially prehensile upper lip, which, like its fellow, is covered with dense velvety hair, forming, it would appear, an efficient protection against thorn-pricks. Probably the teeth assist in "combing" the leaves from the branches ; and it may be that the double crowns of the outer pair of lower front

FIG. 75.—Somali Giraffes feeding on Mimosa to the east of the General Mathews Chain, from a photograph by Lord Delamere.

teeth are for the purpose of aiding this action. For defence these animals depend mainly on sight and speed; but when wounded they are reported to strike out with their fore-feet in a highly dangerous manner; and the same action may perhaps be employed when the bulls are fighting with one another.

The following account (which refers in part to the Somali species) of the habits and mode of occurrence of giraffes in East Africa is abbreviated from one furnished by Mr. A. H. Neumann:—

"As a rule, giraffes prefer rather open bush-country. They are particularly numerous in the neighbourhood of the Gwaso Nyiro river, a little north of Kenia, where the character of the country appears just suited to their wants; and I have there seen large herds (containing forty, fifty, or more individuals) on both sides of the river. Occasionally, however, giraffes are found in pretty thick bush—I have come on them in such situations a little north of the Tana river, and sometimes elsewhere; and in these instances it is wonderful to see how such ungainly creatures can gallop through wood so dense that one has difficulty in running one's self, ducking their long necks to pass under the branches as they plunge along with their rocking-horse gait. But although they may enter dense bush in their search for some favourite food, they do not penetrate far into such covert. So much is this the case that, when traversing thickly wooded country, if giraffe-spoor is seen, it is a sign that more open ground is not far off; and I have, on occasion, after a long weary struggle through tiresome scrub, hailed with delight such evidence that we should soon reach easier going.

"The cows sometimes get very fat, and then their meat is unsurpassed by that of any African animal, and none will keep so long. It is hardly credible that, even when travelling in Equatorial Africa, if properly treated, it will remain quite good for a week easily in fine weather, and even longer sometimes, for it seems rather to dry up than decay. An old bull is quite uneatable.

"These animals are very difficult of approach, in a general way, for they are extremely keen-sighted, and their towering height enables them to command a wide view. When several are together, as is generally the case, they are especially hard to stalk, since it becomes impossible to keep out of sight of all those different pairs of eyes, up among the tree-tops, at once; and if, as sometimes happens, they are accompanied by other game, the difficulties are still further increased. It is then only by the most careful, pains-taking stalk, exercising every precaution, regardless of sun, thorns, and other inconveniences, and very likely spending a long time over it, that the hunter can hope to arrive

FIGS. 76 & 77.—Cow and Bull Somali Giraffes, photographed by Lord Delamere in the Boran-Galla country.

within shot. Even then many disappointments result, for the animals are probably moving about, so that one may suddenly come into full view of the stalker just as he is executing an arduous crawl ; and even though he instantly become rigid and lie motionless, patiently baking on the hot ground, its large, keen eye may have detected a movement and the alarm be given. If once you get within moderate distance of your game, it often becomes easier to approach still nearer ; for it may then be possible to get their heads behind bushes over which they previously looked. Arrived within convenient shot, do not edge round to come into full view ; rather sit and wait till the giraffe comes out from behind the screen, when, if you remain immovable, you will not be noticed.

" I have never heard giraffe make any sound, nor have I heard or read anywhere that their cry, if they have one, has ever been noticed."

THE SOMALI GIRAFFE

(*Giraffa reticulata*)

(PLATE xiv, fig. 1)

The so-called " netted " giraffe, which was first named by Mr. W. E. de Winton in the Zoological Society's *Proceedings* for 1897, p. 277, may be provisionally regarded as a distinct species, although its colour-pattern is merely an extreme development of that of the Nubian race of the ordinary species. Its range extends from Somaliland through the Lake Rudolf district to the northern part of British East Africa.

The body and neck of the Somali giraffe (figs. 76 and 77) are coloured of a deep liver-red, marked with a coarse network of narrow white lines, the meshes of which gradually decrease in size towards the head, although they are everywhere large. On the head itself the markings change to rounded chestnut spots on a fawn-coloured ground ; the back of the ears being pure white, as are the legs below the knees and hocks. The liver-coloured areas on the body and the lower half of the neck are for the most part quadrangular, and show no tendency to become rounded. The essential feature of the colouring is the superposition of a white network on a liver-red ground, so that this species cannot properly be described as a spotted animal. The unpaired horn on the forehead is moderately developed.

The type of coloration distinctive of the Somali giraffe seems to be a special adaptation to render the animals as invisible as possible when in the scrub-jungle to which they habitually resort (fig. 75).

No living example of this handsome giraffe has hitherto been brought to this country, nor, so far as I am aware, to the Continent; neither is there a complete mounted skin in any of our museums. The British Museum has, however, a mounted head and neck; and excellent photographs of dead individuals, as well as of living ones in covert, were obtained during Lord Delamere's expedition to East Africa, some of which are here reproduced.

THE OKAPI

(*Ocapia johnstoni*)

Okapi OR *O-a-pi*, SEMLIKI PIGMIES; *Kengi*, ALBERT EDWARD DISTRICT; *Makapi*, NEPO

The commencement of the twentieth century will always be memorable in natural history annals as the date of the discovery of the existence in the Semliki forest of East Central Africa of a second generic representative of the *Giraffidæ*, in the shape of that wonderful animal the okapi. It is true, indeed, that the German traveller Junker (as is stated on page 299 of the third volume of the original German edition of his *Travels*) saw in the Nepo district a portion of striped skin which was almost certainly that of the okapi; while some years later Colonel Marchand saw on the Welle what is believed to be a living specimen of the same animal. But as neither of these travellers recognised what they saw as new, they cannot claim to have introduced the okapi to the notice of naturalists. This honour undoubtedly belongs to Sir H. H. Johnston, who in 1900 sent to Dr. P. L. Sclater two strips of skin from the Semliki forest, which were exhibited before the Zoological Society on December 18 of that year (see *Proc. Zool. Soc.* 1900, p. 950). In this year Dr. Sclater (*op. cit.* 1901, p. 50) gave a fuller account of these strips, and proposed the name *Equus johnstoni* for the animal to which they belonged, on the supposition that they indicated a previously unknown species of zebra. At the same time extracts were published from a letter of Sir Harry Johnston's, in which it was stated that the Semliki Pigmies were well acquainted with the supposed zebra under the name of the okapi. It was, moreover, known to the officials of the Congo Free State, who communicated particulars to Sir Harry sufficient to render it certain that the problematical animal could not be a zebra. Later on in the same year an entire skin of the okapi (now mounted in the British

Museum) was received from Sir H. H. Johnston, upon the evidence of which Sir E. Ray Lankester, on page 472 of the Zoological Society's *Proceedings* for 1901, definitely pronounced the okapi to be allied to the giraffe, and at the same time proposed for it the name *Ocapia* (= *Okapia*) *johnstoni*. This specimen, which is hornless, was subsequently proved to be a female by the arrival of skulls, skins, and skeletons of the male, which is invariably horned. On the evidence of some of these later specimens it has been suggested that there is more than one species of okapi, and new names have been accordingly proposed, to which, however, it will be unnecessary to refer on this occasion.

The okapi, which is at once shown to be a near relative of the giraffe by the structure of its teeth, represents a generic group of the same family characterised by the males having a single pair of simple skin-covered horns, terminating when fully adult in small caps of bare bone, while the females are hornless. The neck and limbs are relatively much shorter than in giraffes, the ears much broader, and the type of colouring quite different; these two latter features being adaptations to a forest-life. In colour the sides of the face are puce, and the neck and the greater part of the body purplish red or maroon, but the sides of the buttocks and the upper portions of both the fore and the hind limbs are transversely barred with black and white, while their lower segments (shanks) are mainly white, with black fetlock-rings, and in the front pair a vertical black stripe on the anterior surface. Considerable individual variation occurs in the striping of the buttocks; and while in some specimens there is a large white knee-cap, in others there is little or none. The stripe on the front of the fore-leg may also be connected with the black fetlock-ring, or separated therefrom by a white band. The tail is shorter than in the giraffe, with a smaller terminal tuft, which may be more or less completely worn away. In stature the okapi may be compared to the bongo antelope; and, like all forest-animals, it apparently carries its head and neck stretched forwards in a very similar manner.

The nearest ally of the okapi appears to be the extinct *Samotherium* (*Palæotragus*) from the upper tertiary formation of the isle of Samos and Greece, in which the males were likewise horned and the females hornless. *Helladotherium*, of the Grecian tertiary, was a much larger animal, in which both sexes may have been hornless; while *Sivatherium* and *Bramatherium* were equally large ruminants from the corresponding formation of India. In the males of *Sivatherium* the head carried two pairs of horns, of which the hind pair is large and branching, although probably clothed in life with skin.

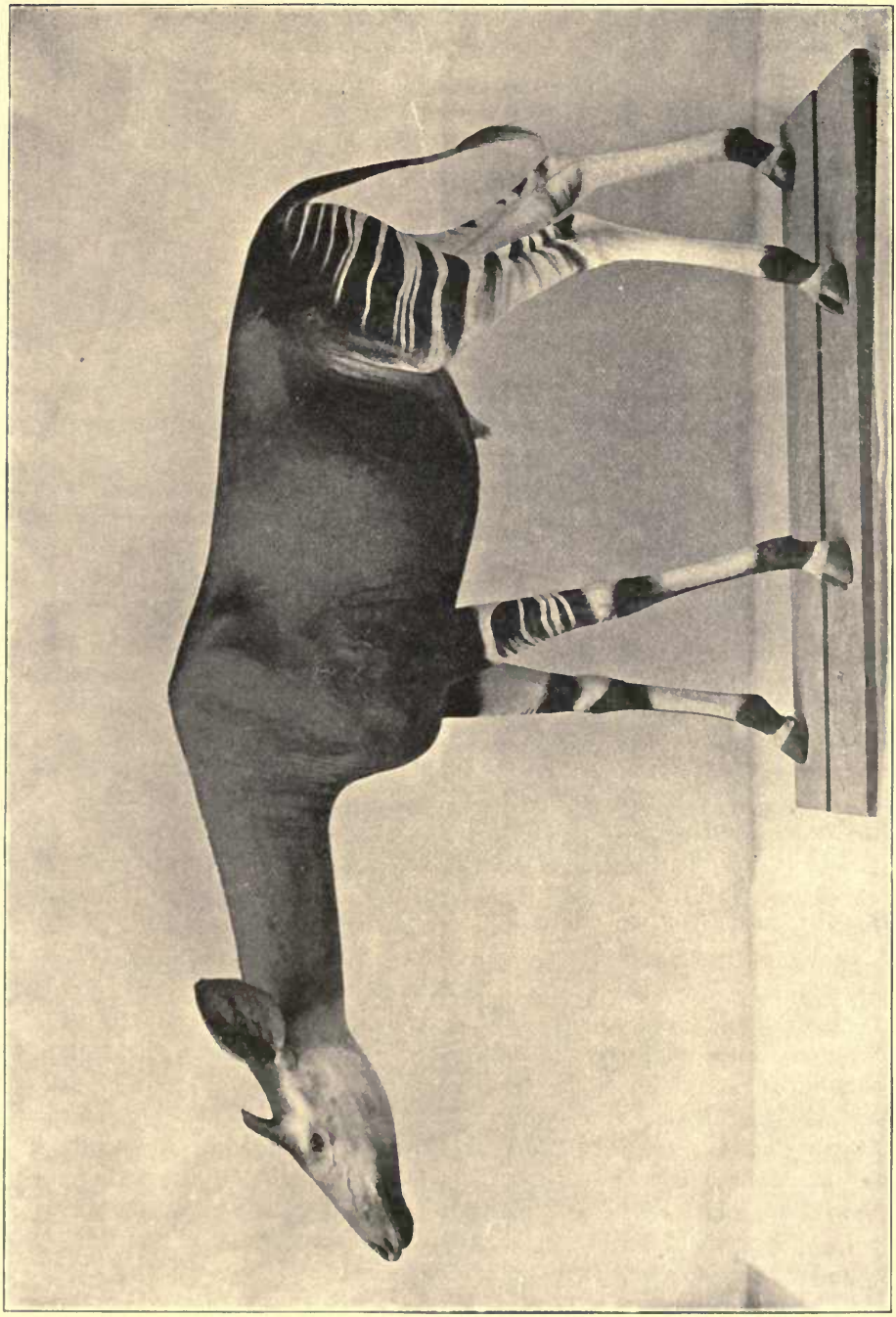


FIG. 78.—A Male Okapi presented to the British Museum by Major Powell-Cotton.

As regards its general characters, the skull of the okapi (fig. 79) appears to be intermediate between that of the giraffe on the one hand and that of the extinct *Samotherium* on the other. It has, for instance, a greater development of air-cells in the intermediate layer than the latter, but much less than the former. Again, in *Samotherium* the horns are situated immediately over the eye-sockets, in the okapi they are placed just behind the latter, while in giraffes they are partly on the parietal bones. In general form the okapi is more like an antelope than a giraffe, the fore and hind cannon-bones, and consequently the entire limbs, being of approximately equal length. From this it seems probable that *Samotherium* and *Ocapia* indicate the giraffe-line; while the apparently hornless *Helladotherium* of the Grecian pliocene may occupy a somewhat similar position in regard to the horned *Sivatherium* of the Indian Siwalik strata.

In 1902 Mr. A. Wiedemann announced in *Orientalische Literatur-Zeitung*, vol. v. p. 220, that he had identified among the paintings from Beni-Hasan, Egypt, of the Twelfth Dynasty, the portrait of an okapi. The picture has been long known to archæologists, and the creature portrayed was sacred to the god Set, and was termed sche. Mr. Wiedemann's description of the portrait of the sche is as follows. The animal is evidently a ruminant of large size, with a long neck rising obliquely from the body, and a long and narrow face. Both lips are elongated, but the upper one projects in front of the lower, so that the mouth approaches a proboscis. The nostrils are situated close to the upper lip. On the forehead, above each eye, is a horn-like process somewhat similar to that of a giraffe, and the ears are large. When the colour of the animal is shown, it is yellowish or almost red. Whether the tail ends in a tuft or in an artistic flourish is difficult to decide. Compared with the okapi, the Beni-Hasan portrait of the sche is stated to show a remarkable resemblance, especially in the contour of the head and body and the profile of the face, although there is a certain difference in the form of the ears. No mention is made of the occurrence of the zebra-like markings of the okapi in the sche, from which it would seem that the portrait of the latter indicates a uniformly reddish coloured animal. As the spotting of the giraffe is clearly indicated in contemporary paintings of that animal, it is practically certain that the zebra-like stripes of the sche would have been equally well shown in the portraits of that animal, had they existed. Mr. Wiedemann suggests that in ancient times the okapi inhabited the Nile valley, where it was well known to

the Egyptians, by whom it was eventually exterminated. It is, however, improbable that a denizen of the Congo forest ever ranged so far north. Moreover, it seems unlikely that the ancient Egyptians ever penetrated so far south as the Semliki forest, or, at all events, that they were so familiar with its animals as to make one of them sacred to their god Set. Whatever animal the sche may have been intended to represent, it thus seems fairly evident that it does not depict the okapi.

As regards the geographical range of the okapi, Dr. Einar Lönnberg gives the following particulars on p. 309 of vol. ii. of the

Fig. 79.—Skull of Male Okapi.

Zoological Society's *Proceedings* for 1905. Starting from the river Ubangi in the west about midway between Mobena and Jwese, the boundary extends north-east towards Businga on the river Likami, or somewhat north of that place, and then more east to the river Welle just before it joins the Ubangi. From that point and eastward to a point about midway between Amadi and Surwango the Welle forms the northern boundary ; from the latter the boundary turns south-eastwards, passing somewhat to the east of Mawambi, to continue to a point a little west of Karimi. Not much south of this, the most eastern point of the great forest, the line turns westward again, to cross the Congo at Pontierville, whence it is continued in a westerly direction a little

south of the Tshuapa river, after which it inclines gradually somewhat to the north, so as to pass on the northern side of Bolondo in the direction of Coquilhatville.

"Outside this boundary," continues Dr. Lönnberg, "there are many forest-clad areas, but they are not extensive, and Lieutenant Eriksson [from whom Sir H. H. Johnston obtained the first skin and two imperfect skulls] does not believe that they are inhabited by the okapi. The latter is an inhabitant of the great forest, in which it does not live everywhere. Its regular pasture-grounds are open glades in the forest, where rivulets with shallow water expand and produce a rich growth of grass. The grass and the leaves of the bushes and undergrowth beneath the trees, which are especially luxuriant in such places, may form the chief food of the okapi. Although a shallow sheet of water expands over the flat ground to a greater or less extent in these glades, there are no swamps. The soil is hard and firm, which explains the shape of the hoofs of the animal. Lieutenant Eriksson has not seen the okapi in a living state in its natural surroundings, as probably no white man ever has or is likely to do. But he has, while on his marches at night, many a time heard it run away when he passed glades such as those described above.

"The okapi is extremely wary and shy, and nocturnal in its habits. It lives singly, or perhaps in pairs, never in herds. The Negroes know very little about it; and, as a rule, it is only the Mobatti Dwarfs who are able to kill it."

The only exception that can be taken to this is that, from the structure of its skull (in which the face is not bent down on the basal axis as in sheep and goats), the okapi is probably more of a browser than a grazer. This seems to be borne out by the following account abbreviated from one published in German by Dr. J. David.

"The okapi," writes this observer, "dwells in the most dense parts of the primæval forest, where there is an undergrowth of solid-leaved, swamp-loving plants, such as arum, donax, and phrynium, which, with orchids and climbing plants, form a thick and confused mass of vegetation. The leaves of these plants are blackish green in the gloom of the forest, grow more or less horizontally, and are glistening with moisture. The effect of the light falling upon them is to produce along the midrib of each a number of short white streaks of light, which contrast most strongly with the shadows cast by the leaves themselves, and with the general twilight gloom of the forest. On the other hand, the thick layer of fallen leaves on the ground and the bulk of the stems of the forest-trees are bluish brown and russet, thus

closely resembling the decaying leaves in a European forest after heavy rain ; while the whole effect is precisely similar to that produced by the russet head and body and the striped thighs and limbs of the okapi.

"The long and mobile muzzle of the okapi appears to be adapted for feeding on the low forest underwood and the swamp vegetation. The small size of the horns of the males is probably also an adaptation to life in thick underwood through which the creature stalks with outstretched neck, the silence of the forest being broken only by the plash of falling moisture or the occasional scream of the hornbill."

In Dr. David's opinion an okapi in its native forest could not be seen at a distance of more than twenty or twenty-five paces. At distances greater than this it is impossible to see anything clearly in these equatorial forests, and it is very difficult to do so even at this short distance. If these observations are trustworthy, we have definite evidence that the colouring of the okapi is of a purely protective type, as, indeed, has long been suspected.

In a letter from the Congo Free State, published in the *Times* at a later date, Major P. H. G. Powell-Cotton stated that a fine okapi, of which the skin and skeleton are now in the British Museum, was killed at Makala, in the Ituri forest, by the native hunter Agukki, who shot the two specimens taken to Europe by Dr. David. After careful inquiry, Major Powell-Cotton was unable to satisfy himself that any European has hitherto killed an okapi. A Swiss official named Jeannet, in the employ of the Congo Government, was, however, in 1905 shown one of these animals by a native as it stood in thick covert, where it was shot by the latter. This the writer believes to be the first living okapi seen by a European.

According to information furnished by the Mobatti Pigmies, the okapi is generally a solitary animal, the two members of a pair invariably feeding apart, although, together with their single calf, they may frequent the same section of the forest. The calf, which is born in May, is left hidden in covert by the female, who returns to it at intervals for feeding purposes. Hearing and smell are very acute in the okapi, so that the sound of an axe or the faintest scent of man drives it from its feeding-grounds into the depths of the forest. Even when feeding it is restless, and it seldom reposes long in the same lair. In the Ituri forest these animals avoid swampy ground, and always drink from clear running streams. During rain they seek shelter in the densest thickets or even under an abandoned roof, and it is at such times that they are most usually seen by the natives.

In the Ituri forest the okapi does not eat the giant leaves of *Sarophrynium arnoldianum*, which Major Powell-Cotton believes to be the plant alluded to by Captain Alexander in the following account of the animal in the Welle district.

During the Alexander-Gosling expedition through Nigeria to the Congo, the skin of a male okapi was procured, which is now exhibited in the British Museum (Natural History). The following particulars regarding okapi were communicated by Captain Alexander to the *Times*:—

"The okapi here is generally found singly or in pairs, but Mobatti hunters state that sometimes three may be found together. An essential to the life of the okapi is a small stream of water with some muddy and swampy ground on either side. In this grows a certain large leaf that on its single stalk attains a height of 10 feet. It is the young leaf of this plant that is the favourite food of the okapi, and I venture to say that where the plant is not to be found the animal will not exist. During the night it will wander along in the mud and water in search of it. Here it may be found feeding as late as eight in the morning, after which it retires to the seclusion of the forest, where it remains until nearly dusk. On the three occasions that I was at close quarters with the beast, it was perfectly concealed in this swamp leaf. Near the river Welle I found its spoor on ground frequented by buffalo and waterbuck, but this is unusual; and its companions in the forest are the elephant, the greater bushbuck [bongo], and the yellow-backed and small red duikers. The okapi is very quick of hearing, and in that respect is classed by the Mobatti with the bushbuck (local name 'bungana'). In the forest here I consider the latter more difficult to obtain than the former. On the hunting-ground of the first village I visited I estimated the number of okapi at five or six, at the second and third nil; and twenty miles south in the forest, on very likely ground, where my guide said they were formerly numerous, there was one only, probably owing to rubber-collectors who had been there."

Several specimens had been speared, shot, or trapped by natives shortly before the time of Captain Alexander's visit, but time did not admit of further investigation.

At the British Association meeting of 1907 there were exhibited photographs of a living fawn of the okapi taken by Mr. Ribotti at Bambili, in the Congo Free State. Mr. Ribotti claimed to be the first European to see a living specimen of this animal, and it seems well established that he is the only one who has hitherto secured a

By permission of the Editor of The Sphere.

FIG. 80.—The Female Okapi presented to the British Museum by Sir H. H. Johnston.

photograph. In the letter quoted above Major Powell-Cotton has, however, stated that, so far as he could ascertain, the first European to see a live okapi was Mr. Jeannet, a young Swiss official of the Congo Government, and he gave the date as the spring of 1905. A few days subsequent to Major Cotton's communication (September 29, 1906), the *Times* gave the substance of a letter from Colonel J. J. Harrison, in which that gentleman affirmed that he had the good luck to see one in 1904, when hunting on the Welle.

Those readers desirous of further information about the okapi should consult a memoir by Sir E. R. Lankester in vol. xvi. of the *Transactions* of the Zoological Society (1902), and a larger one by Mr. J. Fraipont published in the *Annales* of the Congo Museum in 1907.

THE RED DEER

(*Cervus elaphus*)

Al wassi, ALGERIAN ARABIC; *Fertassa*, TUNISIAN

Although Africa south of the Sahara and the northern tropic is characterised by the total absence of the deer-tribe, or *Cervidæ*, there occur in the north-western districts of the continent two representatives of that group, which are evidently outlying members of the European fauna, being, in fact, at best nothing more than local races of European species, and thus serving, in connection with the rest of the fauna, to demonstrate the existence of a recent land-connection between north-western Africa and south-western Europe. Under these circumstances a slight notice of the two species in question will suffice.

Deer, it may be mentioned, may be distinguished from the giraffe family by the fact that the crowns of the outermost pair of lower front teeth are simple and undivided, as is shown in the figure on page 351. The males of nearly all species of living deer are, moreover, characterised by the appendages on the head taking the form of antlers. These, it is almost superfluous to state, although covered with a soft velvety skin during growth, when fully developed consist of bare rugged bone, supported on a pair of skin-covered pedicles, from which they are periodically shed, to be replaced the following season. Antlers, although occasionally in the form of simple spikes, are generally branched in a more or less complex manner. Many deer have upper tusks, which are always wanting in the *Bovidæ*; and in the species without antlers these are long and sabre-shaped. The

lateral hoofs have proper supporting bones, which are always lacking in the hollow-horned group (*Bovidæ*). Whether the minute caps of bone on the summits of the horns of the male okapi are degenerate antlers, or parallel developments, is difficult to determine.

The Barbary red deer (*Cervus elaphus barbarus*) is merely a small local race of the red deer of Europe, of which the typical representative is the Swedish stag. In the African race the shoulder-height is usually

FIG. 81.—A Barbary Stag at Woburn, from a photograph by the Duchess of Bedford.

about 46 inches in the stags, and the antlers lack the bez, or second, tine which is developed in the European continental stag. The general colour of the stags in the African race is dark sepia-brown, with a lighter and greyer tinge on the back, and occasionally showing faint traces of yellowish spots, which are fully developed in the fawns.

These deer are found at the present day in the extreme east of Algeria, in western Tunisia, and, it is reported, in certain parts of Morocco, although this may be doubtful. According to Sir H. H. Johnston, the only districts where they are known with certainty to

occur "at the present day is that strip of well-forested country which extends from near the Mediterranean coast on the frontier of Algeria and Tunis (near La Calle), southwards to the verge of the Sahara Desert. The deer is most abundant in the cork-forests of north-western Tunisia and in the pine-forests to the east of Tebessa. The Barbary stag is now protected in Tunisia, and is increasing considerably in numbers, especially in the pine-forests on the Tunisian side of the frontier near Tebessa."

THE FALLOW DEER

(*Cervus* [*Dama*] *dama*)

The fallow deer—a species too well known to require anything in the way of description in this place—is found at the present day, or at all events was till recently, in the wild state in parts of Greece, Spain, Portugal, Sardinia, and Asia Minor, and is likewise believed to be indigenous to northern Africa, more especially eastern Algeria. According, however, to Sir H. H. Johnston, there is no evidence of the occurrence of truly wild fallow deer in either Tunisia or Algeria during the nineteenth century. It is true, indeed, that there was a small herd of about fifty head on a certain estate in the north of Tunisia about a dozen years ago; but these are stated to be the descendants of deer imported by the Beys of Tunis from Europe. The subject requires further investigation.

THE WATER-CHEVROTAIN

(*Dorcatherium aquaticum*)

The chevrotains, or mouse-deer, as they are commonly called, are small, delicately built ruminants, in some respects intermediate beween deer (with which they are often confounded) on the one hand, and camels and pigs on the other. They have, for instance, the hinder cheek-teeth of a deer-like type, and they lack upper front or incisor teeth. But their foremost cheek-teeth are of a more pig-like type, while the structure of their feet is, on the whole, more pig-like than deer-like. They have no trace of horns or antlers, but their upper jaws are armed with formidable flattened tusks, like those of the musk-deer. Chevrotains form a family (*Tragulidæ*), of which the typical members (*Tragulus*) are confined to the warmer parts of Asia, the

sole African representative being the present species, which, although long believed to be restricted to the west coast, is now known to range right through the equatorial forest-tract. From the typical Asiatic chevrotains, the water-chevrotain is mainly distinguished by its shorter and stouter hoofs, the larger lateral hoofs, and the absence of a true cannon-bone in the lower segment, or shank, of the fore-legs, in which the two component bones remain separate instead of fusing together as in more typical ruminants. The African species, which is the only existing member of the genus, has but six pairs of lower cheek-teeth, whereas in the fossil European species, on which the genus *Dorcatherium* was originally founded, there are seven pairs.

The water-chevrotain is the largest existing representative of the group, standing about 13 or 14 inches at the shoulder. In common with those of other members of the family, the males have long upper tusks, but the females are quite unarmed. The limbs are extremely slender and delicate, the ears small and rounded, and the tail short and bushy. The general colour of the moderately long and rather coarse fur is olive-grey, profusely spotted and striped on the body with white or yellow, the thick and irregular stripes being longitudinal in direction, and for the most part confined to the flanks. There are, however, large areas of white or yellowish on the throat and chest, while the whole under surface of the tail is also white or straw-coloured.

On the west coast the range of the water-chevrotain extends from the Gambia to the Cameroons, while it stretches eastwards through the forest-region to the Ituri, where specimens were obtained by Major P. H. G. Powell-Cotton. In the Zoological Society's *Proceedings* for 1906 (vol. i. p. 113) I have suggested that there may be three local races of water-chevrotain, distinguished as follows:—

First, the typical Gambian race, in which the markings on the under surface of the chin, throat, and chest are white, and the face is uniformly chestnut or nearly so. The white markings on the back and flanks are fully developed; there is a very distinct white flank-band running from the shoulder along the flanks to join the transverse loin-band, below which are two other flank-bands; the spots on the back form distinct and continuous transverse bands; and the tail has much brown above. From this the Ituri race (*Dorcatherium aquaticum cottoni*) differs by the light markings on the back and flanks being less distinct and less numerous; the flank-band yellow instead of white, and almost disappearing midway between the head and fore-limbs; the absence of flank-bands below it; the spots on the back less distinctly in the form of bands; and the tail having a very large amount of white, and being

apparently more bushy. In the Cameroons race (*D. a. batesi*) the markings on the under surface of the chin, throat, and chest are yellow, and the face has a black chevron running from the muzzle to the eyes. The light markings on the back are in the shape of yellowish-white spots anteriorly, but on the loins form almost continuous yellow bands, arranged alternately on each side of the middle line, where they are interrupted; there is one distinct yellowish flank-band joining the transverse rump-band; and the tail is brown at the base, which is the only part known. It is just possible that the yellow in the one specimen at present known from the Cameroons may be due to staining, and if so, the description will, at least to a certain extent, be wrong.

In books on natural history the water-chevrotain is stated to frequent the banks of streams, and to have much the habits of a wild pig. According, however, to Major Powell-Cotton, it actually swims and dives in the water, apparently much after the manner of a South American capibara. It is thus really much more entitled to the name duikerbok than is the animal to which that title properly belongs. A female which lived many years ago in the London Zoological Gardens gave birth to a single fawn; the number of young at a birth in the Indian mouse-deer is either one or two.

THE WILD BOAR

(*Sus scrofa*)

Quadruk, ARABIC

As previously mentioned, the three families of the hollow-horned ruminants (*Bovidæ*), giraffes and okapis (*Giraffidæ*), and deer (*Cervidæ*) agree in the common feature of having crescent-shaped cusps on the crowns of their cheek-teeth, and in lacking upper front teeth. They also exhibit a mutual resemblance in the complex structure of their stomachs, in the fusion of the two bones of the lower part of each leg to form a cannon-bone, and likewise in the almost universal presence of a pair of appendages of some kind on the head in at least the males. In all these respects pigs and hippopotamuses differ from the above type, having irregular warty or trefoil-shaped cusps on their hind cheek-teeth, well-developed upper front or incisor teeth, comparatively simple stomachs, no cannon-bone in the lower part of the limbs, and no horn-like appendages on the head. As they also differ, although in a less

striking manner, from the mouse-deer or chevrotains, the two families are classed in a group by themselves, under the name of Suina.

The pigs themselves (*Suidæ*) are distinguished by the long head, the truncated, mobile snout, terminating in a naked disc, in which are pierced the nostrils, and the upward curvature of the tusks of the upper jaw, against the sides of which the lower tusks bite. In the feet the pair of side-toes are comparatively small and not applied to the ground in walking; while the hind cheek-teeth, of which the last on each side of the lower jaw is elongated, do not show a distinct trefoil-pattern on their grinding surfaces. Bristly hair generally more or less completely clothes the body.

The more typical pigs, as represented in the first place by the wild boar, are characterised by the comparatively narrow and pointed head which is almost conical in shape and does not carry large conical warts on the face; by the comparatively small size of the upper tusks; and also by the relatively simple structure and lowness of the last of the cheek, or molar, teeth in each jaw. The wild boar, as the typical representative of the whole group, requires nothing in this place in the way of description, except perhaps the statement that the height at the shoulder may reach about 36 inches in fine specimens. The range of the species originally included the greater part of Europe, northern Africa, and south-western and Central Asia, at least as far east as the Thian Shan.

FIG. 82.—Head of Wild Boar.

The wild boar of Morocco and Algeria was separated as a local variety or race from the typical wild boar of Europe by Dr. P. L. Sclater on p. 443 of the Zoological Society's *Proceedings* for 1860, as *Sus scrofa barbarus*; and this name it has been suffered to retain, despite the fact that its difference from the wild boar of France (which, be it remembered, is not the typical race of the species) appears to be but slight.

Vicomte Edmond de Poncins, who has shot both the Algerian and the French wild boar, states that the former is often a little darker than the latter, and has also shorter and less abundant hair, while its snout appears to be slightly longer. This sportsman gives 33 inches as an average height of an Algerian boar, although he admits the

occurrence of specimens measuring 35 or possibly even 38 inches at the shoulder: one shot by the Vicomte weighed 275 lb.

"In Algeria the wild boar," according to the same sportsman, "is to be found in every place where forest or brushwood abounds. The jungle is very thick, and these animals seldom leave it except at night. Sometimes one may see them at early morning, or just before dark, in the clearings or on the outskirts of the forest. They love the thickest and the coolest places, and often wallow in the mud. In the daytime, unless there be heavy rain, they lie up and seldom move. Often eight, or even ten, young are born in a litter, nearly always in a dry place near to water. They are striped at first; but by the time they have grown to 20 lb. weight they are brown, and when a weight of more than 50 lb. is attained they turn black. The members of a litter keep together until they are about a year-and-a-half old and weigh some 120 lb. apiece. An ordinary sounder of hog would comprise a three-year-old boar of 140 to 160 lb. in weight, a sow of about 140 lb., and six or seven young pigs of about 40 or 50 lb. each. When the young have attained a weight of about 100 lb. they often herd together and quit the parents.

"Boars over three years old often associate by themselves, and visit the sounder only at rutting-time. If some of these big boars happen to meet near a female, a tremendous fight takes place, as I have more than once witnessed. When five or six years old, the hair is often greyish or brownish in hue. The older swine frequent the vicinity of water and mud, and often spend the day in moist spots where dense and thorny bushes grow beneath larger forest-trees. About March nearly all the boars are found near water; but in hot weather they often betake themselves to the hills in search of shady and cool ravines, returning in September. The females occasionally breed when only a year old, but as a rule not until they have nearly attained two years."

Very little seems to be known with regard to the wild boar inhabiting Sennar, Kordofan, and the eastern Sudan, which was described by Fitzinger in 1864 as a distinct species, but is probably nothing more than a local race of the wild boar. If distinct from the Morocco wild boar, it should accordingly be termed *S. s. sennarensis*. The dense bristly coat is stated to be dull olive-black varied with yellow in colour; but further particulars in regard to this animal are much required.

The young of all the wild representatives of the genus *Sus* are marked with yellowish longitudinal stripes.

THE BUSH-PIG

(*Potamochœrus chœropotamus*)

Bosch-vark, CAPE DUTCH; *Ingulubi*, SWAZI AND ZULU; *Nguruwe*, NYASA

Although near akin to the typical swine of North Africa, Europe, and Asia, the bush-pig of South Africa and its relatives present certain peculiarities which render it, on the whole, convenient to refer them to a genus apart. They have, for example, only 42, in place of 44, teeth; and their tusks are relatively small. Of more importance is the presence of a ridge of bone on each side of the nose-bones immediately above the root of the upper tusk, and of a second ridge on the sheath of the tusk itself, in the skulls of adult boars. In very old boars the upper ridge has a horny covering, so that it in some degree represents a horn. The ears terminate in tufts of long hair; and very frequently the colouring of the whole animal is bright. Like so many modern African animals, bush-pigs appear to have existed in tertiary times in India; the extinct species described as *Sus hysudricus*, *S. titan*, and *S. giganteus* being now referred to the genus *Potamochœrus*.

As regards the number of species of bush-pigs, the paper by Dr. C. J. Forsyth-Major in the *Proceedings* of the Zoological Society for 1897 is here followed. It should, however, be mentioned that in the appendix to Major Powell-Cotton's *Sporting Trip through Abyssinia* the Hon. Walter Rothschild recognised the following seven African species, viz.—

Potamochœrus chœropotamus.—West Africa, south to Angola.
Potamochœrus capensis.—South Africa.
Potamochœrus nyasæ.—Lake Mweru and South-West Nyasaland.
Potamochœrus dæmonis.—Uganda and German East Africa.
Potamochœrus johnstoni.—North-West Nyasaland.
Potamochœrus hassama.—North-East Africa.
Potamochœrus porcus.—West Africa.

In addition, there is the Malagasy *P. larvatus*, which probably reached its present habitat from East Africa by swimming the intervening Strait.

The present species (*P. chœropotamus*) is characterised by the great development of the ridges on the face of the skulls of adult

boars, the upper ones forming a pair of convex crests projecting high above the plane of the nose, while the pair on the roots of the tusks reaches to that plane. The upper surface of the skull in advance of the (post-orbital) processes at the hind border of the eye-sockets is relatively narrow. Although the southern representatives of the species have the skin black, with grey, brown, or blackish hairs, some of the eastern, and probably also the western, races are reddish in colour. In adult boars the face is dirty white, while the ear-tufts and the dorsal crest are black.

According to the foregoing list given by Mr. Rothschild, *P. chœropotamus* is typically a western species, extending from the west coast to Angola. I have, however, not seen a description of a western representative of the species; and in the *Proceedings* of the Zoological Society for 1906, p. 632, Mr. Rothschild himself writes of this species as being typically South African.

According to the latter view, the bush-pig of the Cape does not require a separate racial name. In this race the colour is very generally grey; but years ago Sir Andrew Smith (who may have been referring also to some of the more northern races) remarked that "scarcely any two specimens of the species exhibit the same colours; some are a brownish black variegated with white, and others are almost entirely of a light reddish brown or rufous tint, without any white markings; indeed, such are the varieties that it is scarcely possible to say what are the prevailing colours." The ears, which are whitish internally, have black margins and tufts.

In the Lake Mweru district and the south-west portion of Nyasaland the Cape bush pig is replaced by a reddish race (*P. c. nyasæ*). These Nyasa bush-pigs agree, however, with the present species in the characters of the skull, and also differ from the red river-hog by the absence of black on the face of the adult boar, and the black ear-tufts and crest. The colour is much redder in immature than in fully adult specimens.

To the Kilimanjaro race Dr. Major (who also named the Nyasa bush-pig), in the Zoological Society's *Proceedings* for 1897, p. 367, has given the name *P. c. dæmonis*; the title *dæmonis* referring to the habitat of the race, the etymology of Kilimanjaro being *kilima*, a mountain, and *njaro*, a demon. This race was named on the evidence of the skull and skin of a female. The latter is covered with long blackish-brown bristles; while the skull agrees with that of females of the present species in the flatness of the posterior nasal region, as well as in the complexity of the molar teeth, although in the shortness

of the last upper molar and apparently in certain other details it approximates to that of the red river-hog. According to the Hon. Walter Rothschild (*Proc. Zool. Soc.* 1906, p. 632), the males of this race are distinguished by their intense blackness.

In south-west Africa the bush-pig may attain a height of about 31 inches at the shoulder, with a weight of some 35 lb. Lower tusks average from $6\frac{1}{2}$ to 7 inches in length.

The following notes on the habits of bush-pigs in south-east

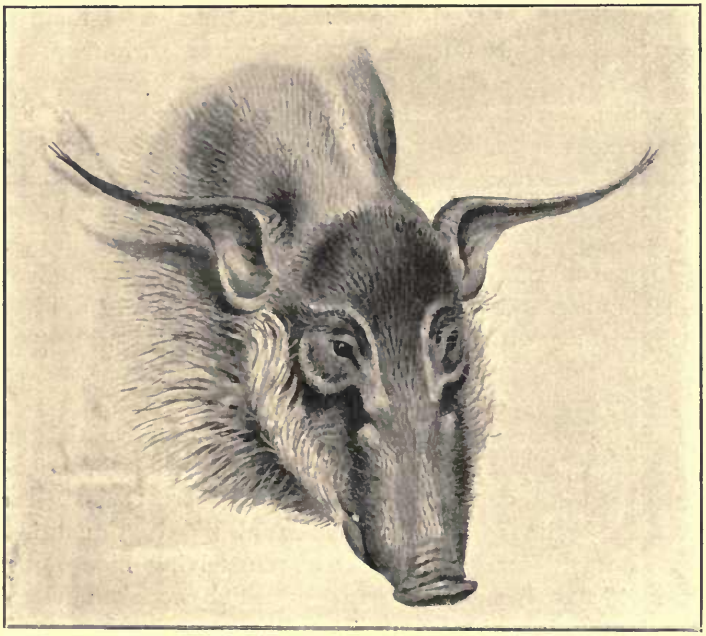


FIG. 83.—Head of the Bush-Pig.

Africa are abbreviated from an account furnished by Mr. F. Vaughan Kirby :—

"Bush-pigs range from the south-eastern districts of Cape Colony throughout the forested tracts of the east coast to the Zambesi; but are only really common in rough, broken, well-wooded and well-watered country, and being retiring in their habits, are seldom seen unless systematically hunted. During the day they lie-up in long jungle-grass, in patches of thick scrub on the edge of a kloof or forest, or in dense reed-beds. In the rains they make cunningly-devised shelters amongst thick bush and long grass, boring their way in, and

using their snouts to such good purpose that a long, wide tunnel, almost impervious to the heaviest rains, is soon formed. They feed throughout the night, generally in herds of from four or five to as many as twenty in number; and at dawn retire to their lairs, seldom moving again—except in misty or wet weather, when they feed throughout the day—till evening. They do incalculable damage to the crops of the natives, visiting the same gardens night after night, and trampling down what they do not eat. Their principal food consists of roots, berries, and wild fruit, but they also devour reptiles, eggs, and small birds, and on one occasion a number of them partially ate the carcase of a bushbuck. They are expert swimmers and swift of foot, and can get over the roughest ground at a great pace. There are no pluckier beasts in Africa than bush-pigs, and even a leopard will hesitate before attacking a full-grown boar. Like all wild animals they have an instinctive dread of man, and will always seek to escape if possible; but if surrounded or wounded and brought to bay, they appear to accept the situation with stolid imperturbability, and die fighting against all odds, grim and silent to the last. The young are born in December and January—usually five or six in a litter; they are prettily striped with brown and pale yellow. Bush-pig are very tenacious of life; and their flesh, although somewhat coarse, is excellent in the rainy season.

"I have elsewhere described a style of bush-pig hunting in which the rifle is only occasionally used, the game being brought to bay and killed with assegais. It was in this sport that I learned to appreciate the gallant pluck and splendid fighting qualities of the bush-pig. I have seen an old boar after receiving nine thrusts from those terrible 'stabbing assegais,' two of which were still fast in him, make a charge that scattered us like chaff, and in three consecutive lunges lame one of our number for life and disembowel two of the finest 'pig-dogs' with which I ever hunted. In such encounters a boar inflicts terrible wounds with his teeth as well as with his tusks. The plan invariably adopted on these hunts was to take up the spoor from the 'mealie-fields' in the early morning, and follow it till we marked the pigs down in a certain bush or kloof, which was then immediately surrounded, the dogs loosed, and the pigs brought to bay. A word of advice to any one who may wish to try this form of sport. The regular 'stabbing assegai' of the Swazis, although very handy in thick bush, is too short in the haft to be of any service in stopping the rush of a boar. The charge must be dodged, and the weapon plunged between the shoulders of the boar; or a longer haft

can be fitted, and, if the bush be not too dense, the charge may be met squarely on the lowered point."

JOHNSTON'S BUSH-PIG

(*Potamochœrus johnstoni*)

The skull of a female bush-pig collected by Sir H. H. Johnston on the north-western shore of Lake Nyasa in the neighbourhood of Deep Bay has been the type of a species by Dr. Forsyth-Major on p. 367 of the Zoological Society's *Proceedings* for 1897. Although referable to a subadult animal, this skull is remarkable for its large size, straight profile, and general slenderness; while the nasal region, in place of being flattened, with angular lateral margins, is rounded off. The cheek-teeth are relatively large. From these peculiarities, it was anticipated by Dr. Major that the male skull would likewise present well-marked characteristics of its own.

It was suggested by Sir H. H. Johnston that certain bush-pigs from south-east Nyasaland, which are reported to be faintly striped and spotted with white, would turn out to belong to this species. According, however, to the Hon. Walter Rothschild (*Proc. Zool. Soc.* 1906, p. 632), the coat of the boars is dirty red, with a few intermingled black hairs; the colour being intermediate between that of *P. chœropotamus* and *P. porcus*. The skull shows some approximation to that of the Malagasy *P. larvatus*.

THE ABYSSINIAN BUSH-PIG

(*Potamochœrus hassama*)

Assami, ABYSSINIAN; *Askarmar*, ARGO

According to Dr. Major, in the paper cited above, the skulls of males of this species, while showing an approximation to the red river-hog in the stoutness and lowness of the ridges above the tusks, and likewise in the breadth of the facial portion in advance of the processes at the hind borders of the eye-sockets, are peculiar and distinct from those of all other species in the great length of the portion behind the aforesaid processes. This bush-pig was named by the Austrian naturalist Heuglin in 1863; but it is difficult to obtain particulars with regard to its colouring.

THE RED RIVER-HOG

(*Potamochœrus porcus*)

This west coast species is one of the most brilliantly coloured of all large herbivorous animals; but, like other members of this group, is best distinguished by the characters of the skull in adult boars. In these the lateral ridges above the tusks have flattened summits which do not project above the plane of the nose, and thus do not form convex crests; while the ridges on the sheaths of the tusks are narrow at their bases, expanded above, and low, and not reaching the plane of the nose-bones. Both pairs of ridges are very stout. The ears are densely haired and have very long terminal tufts, which, like the margins, are white. The general colour is bright brownish red, with a large portion of the face and the outer surface of the ears black, and the whiskers, the crest on the back, and a streak above and below each eye white.

The Cameroons and Guinea are well-known localities for the red river-hog, which has a wide distribution on the west coast; although whether it is this species which occurs in Angola, and how far its range extends into the interior, have yet to be ascertained. Its habits are doubtless generally similar to those of other bush-pigs, although information is scanty on this point.

THE FOREST-HOG

(*Hylochœrus meinertzhageni*)

Tumtu, NANDI; *El Guya*, MASAI; *Engak*, CAMEROONS

About the time the okapi was discovered reports became current as to the existence in the equatorial forest of a huge hairy black pig, which was neither a bush-pig nor a wart-hog. The truth of these reports was established in 1904, when Captain R. Meinertzhagen sent to the Natural History branch of the British Museum portions of the skin and a skull of the previously unknown monster. On the evidence of these specimens Mr. O. Thomas, in the *Proceedings* of the Zoological Society for 1904, vol. ii. p. 193, established the new genus and species *Hylochœrus meinertzhageni*; the genus being in some degree inter-

mediate between the bush-pigs and the wart-hogs. The tusks, although very much smaller, have the characteristic curvature of those of the wart-hog; and, as in the latter, the upper front, or incisor, teeth are reduced to a single pair. Of lower incisors three pairs are developed in at least some instances, but the outer pair may be shed early. Bush-pigs, it should be mentioned, have three pairs of these teeth in each jaw. The muzzle has a very large terminal disc, and the head of the adult male is distinguishable at a glance from that of a wart-hog by the absence of the second pair of warts behind the tusks and the presence

FIG. 84.—The Forest-Hog, from a boar shot by Captain Houblon.

of a pair of gigantic warty excrescences below the eyes, some three times the size of those of the wart-hog. These warty growths, which are well shown in the photograph, recall one of the funguses which commonly grow on trunks of decaying trees. There are no ear-tufts, and the coat, which is jet black, is much more profuse than that of a wart-hog. In size the forest-hog considerably exceeds the largest bush-pig or wart-hog; and when seen in jungle, the creature, it is stated, might almost be mistaken for a small rhinoceros.

Captain Meinertzhagen obtained his specimens from Mount Kenia and from Nandi, near the Victoria Nyanza, at an elevation of about

7000 feet above sea-level; but the same animal also occurs in the Mau forest and the Elgon district.

The forest-hog of the Ituri has been separated by Dr. P. Matschie (*Annales du Musée du Congo*, 1906) as a separate species, under the name of *H. ituriensis*. Its main claim to distinction would appear to be certain details in the form of the skull; but it is also stated to be a smaller animal, and in the plates of the supposed adult boar the large warty excrescences on the face of the Nandi forest-hog are not shown. This suggests that the specimens described were not fully adult; and if this be really the case, the alleged differences in the skull may be to a great extent dependent upon age-differences.

On the west coast a forest-hog has been described from the Ja Valley, in the Cameroons, by Mr. O. Thomas on p. 2 of the Zoological Society's *Proceedings* for 1906 as *H. rimator*; its claim to specific distinction being the smaller size of the cheek-teeth.

From the point of view of the sportsman, at any rate, all these local varieties of the forest-hog may be grouped together; and if they are really nothing more than geographical races of a single species, these scientific designations should be, respectively, *H. m. ituriensis* and *H. m. rimator*.

According to native report, these monstrous pigs were numerous in the Nandi forest previous to the outburst of rinderpest in 1891, but nearly all were killed by the plague. They are described as being very fierce, and occasionally making unprovoked attacks on women gathering faggots in the forest. This is confirmed by Captain Houblon's experiences in the Kenia district, where the forest-hog is stated to display no hesitation in charging the approaching sportsman.

In the exhibition galleries of the Natural History branch of the British Museum the forest-hog is now represented by the mounted skin of a female, presented to the Museum by Mr. G. C. Whitaker. It came from the Mau plateau. There is also shown a skull from the Semliki, presented by Colonel J. J. Harrison.

A figure of a female of the western representative of the forest-hog is given on p. 469.

THE WART-HOG

(*Phacochœrus æthiopicus*)

Bango OR *Nguruwi*, SWAHILI; *Darunga*, HAUSA; *Dofar* AND *Karkari*, SOMALI; *Ikulubi*, BASUTO; *Indaigazana*, SWAZI AND ZULU; *Indhlovudawani*, ZULU; *Kolobi*, BECHUANA; *Kurkerrow*, ABYSSINIAN; *Ngolobwi*, BAROTSI AND NGAMI; *Ngron*, M'KUA; *Njiri* OR *Injiri*, CHILALA AND CHIBISA; *Vlak-vark* OR *Vlakte-vark*, CAPE DUTCH.

More like the incarnation of the vision of some hideous dream than perhaps any other living animal, the vlakte-vark is the most specialised, and at the same time the most hideous, African representative of the swine family. That such beautiful and graceful creatures as gazelles, blesboks, and bonte-quaggas should have as their associate such an utterly ugly animal as the wart-hog, seems to demonstrate that beauty, as we understand it, does not form the sole standard in the scheme of creation.

Wart-hogs are characterised by their huge flattened heads, of which the lower extremity is much expanded, while the sides are furnished with three pairs of warty protuberances between the eyes and the tusks, the uppermost pair being considerably the largest of the three. The upper front teeth, or incisors, are reduced to one pair; but three pairs of lower ones are present, although the outer pair may be shed early. The upper tusks, which are coated with enamel only at their tips, are much longer than the lower pair; and the last cheek-tooth in each jaw, which in old age is often the only one remaining in addition to the tusks, is characterised by its peculiarly complex structure, consisting of a number of closely packed, slender, cylindrical columns united by cement. In the latter respect the wart-hog presents much the same relation to an ordinary pig as does an Indian elephant to its extinct relatives the mastodons. Although larger in boars than in sows, the tusks are well developed in both sexes; and in the circumstance that the upper ones are longer than the lower, these tusks are just the opposite to those of ordinary swine. The black hide is sparsely coated with bristly hair, which may be almost completely shed in old animals; but there is a mane of coarse stiff bristles

on the neck, and the tail terminates in a tuft. The general colour in the typical southern wart-hog is brownish grey with a more or less marked rufous tinge in some instances. The young are not striped or spotted. In shape, the skull is altogether peculiar, being very wide and long, much flattened, with a highly concave profile, and the portion behind the sockets of the eyes extremely short. In height the wart-hog stands about 30 inches at the shoulder; while the weight of a large boar may reach as much as 210 lb. The record lengths

FIG. 85.—Wart-Hog Tusks, from a specimen shot by Mr. F. H. Barber.

for upper tusks are 27 and 26 inches along the convexity; but lower tusks, measured in the same manner, seldom exceed 6 inches.

The typical wart-hog is a native of Africa south of the Zambesi; it has been stated that its southern limit was formed by the Orange river, but, although none of these animals are to be met with at the present day in Cape Colony, it seems not improbable that their range may have formerly extended westward from Natal through Kafraria to the original frontier of Cape Colony.

The wart-hog of the country to the northward of the Zambesi has been regarded as a distinct species, but seems best regarded, under the name of *Phacochœrus æthiopicus africanus*, merely as a local race of the southern animal. Its range embraces East, Central, and West Africa,

extending on the east from the Zambesi to the eastern Sudan and Abyssinia, and on the west side of the continent from Ashanti to Senegambia and the western Sudan.

The southern race is the one in which the reduction of the teeth in the adult is generally stated to be carried to its maximum extent; the upper incisors being shed, and the lower ones worn down to their roots. The southern wart-hog is likewise stated to be distinguished

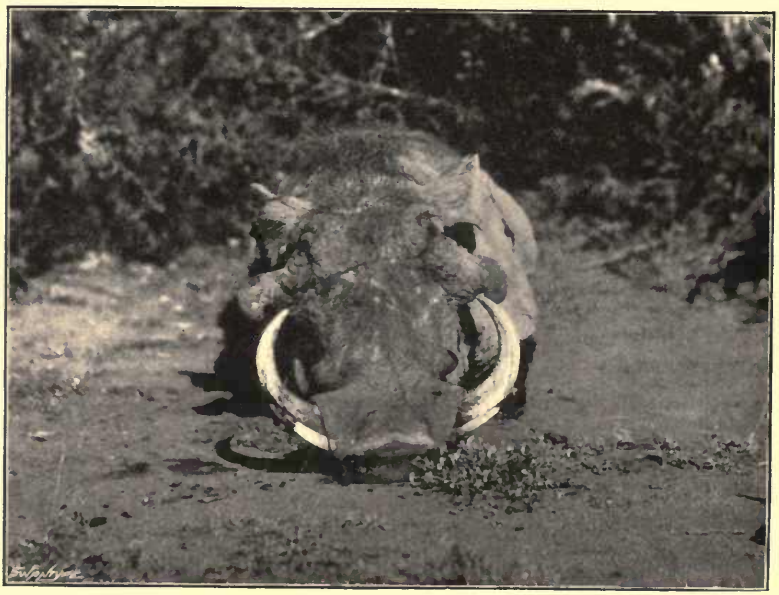


FIG. 86.—A North Somali Wart-Hog, photographed by Lord Delamere.

from its northern representative by its shorter head, which is more convex between the eyes, and by the warts below the latter being very long and pendent, instead of projecting straight outwards. The tusks are also stated to be more inclined outwards. Finally, the mane is reported to be wider and shorter, the hair more abundant on the crown of the head and ears, and the general colour more rufous. It would, however, be well if these alleged differences could be verified in a series of specimens of the same age.

Writing of the wart-hog in south-eastern Africa, Mr. F. Vaughan Kirby (whose account has been somewhat condensed and otherwise slightly modified) observes that—

"It is now rare in Zululand and Amatongaland, but common

enough in Swaziland, Gazaland, and the Transvaal east of longitude 31°. Thence it extends up the east coast through Portuguese East Africa, Manicaland, the Barue country, Mashonaland and Matabililand, and across the Zambesi as far as I have travelled. It shuns densely forested tracts, but is partial to thick thorn-jungle and thin forest with open glades and rough stony 'dongas.' Wart-hogs usually prefer dry and somewhat sandy tracts of country, hence the statements made by Heuglin that they habitually repose on swampy ground, or even in water, has been discredited. In 1896-97, when elephant-hunting in northern Chiringoma, Portuguese East Africa, I obtained, however, confirmatory evidence that the statement is not unfounded. In December and January the great Urema plains were nothing but a vast marsh, in which, at all hours of the day, wart-hogs were incredibly numerous, far distant from the edge of the forest, where the rising ground was dry. They may, of course, have left these drier retreats during the night, but I could not satisfy myself on this point, and came to the conclusion that they seldom deserted the marsh, contenting themselves with lying up in the comparatively dry patches which occurred at intervals. Generally speaking, however, they prefer to lie in wooded dongas, or thick patches of jungle, from which they emerge in the evenings and feed throughout the night. They are partial to a mud-bath, and when following elephant-spoor I came one day on an old boar lying on its back in a mud-hole with all four feet in the air. Their food consists of roots, berries, and grass ; and I have seen them eating the young shoots of the borassus and raphia palms. At one time I believed that they burrowed in the ground, but am now convinced to the contrary: they will occupy old ant-bear holes, and, if necessary, enlarge them, but I can find no evidence from personal observation that they actually dig such holes themselves. Though I have galloped after scores, I have never seen them break out of a swift trot; and when thus running, the tail is held upright, with the tufted tip turned over. Every now and then, when desirous of looking behind, and being unable, owing to the shortness of their necks, to turn their heads in the ordinary way, they raise their snouts and look over their shoulders. Anything more ludicrously absurd than the picture thus presented cannot be imagined. They always enter a burrow backwards, and if pursued seem to slew themselves round and disappear in the hole without halting for an instant. Although I have seen many wart-hogs 'bolted' from their burrows, I have never witnessed the acrobatic feat of throwing themselves over backwards, which they are reported to perform on such occasions.

"Wart-hogs usually run in pairs, or family parties consisting of two or three sows and their young; old boars are, however, more or less solitary throughout ten months of the year. It is a singular fact that, although she has but four teats and only brings forth three or four young in a litter, six or eight young are often seen accompanying a single sow. The sow always litters in a burrow of some sort. The flesh of a fat wart-hog is excellent, though a trifle hard; and that of a young one is particularly tasty.

"Although it is poor fun shooting wart-hog, good sport might sometimes be obtained by riding them, were it not for their invariable custom of going to earth. They are easily killed with a bullet, and their smooth gliding trot makes them an easy mark even when going fast. They have not a fraction of the pluck of a bush-pig, but are sufficiently vicious to be awkward customers to knife when wounded. This requires quickness, as they can bite most severely.

"When hunting on one occasion in the Matamiri bush, I wounded a boar and chased him to earth in a shallow burrow; then, crouching down in front of the hole, I drove an assegai into his throat, but being a light weapon, the haft broke and the hog at once charged out, ran between my legs, and knocked me down. As I fell I seized one hind-leg, when he instantly whipped round and inflicted a nasty wound on one of the 'boys,' thinking, perhaps, that it was he who had hold of the leg. The second 'boy' saved the situation by assegaiing the brute before further harm was done."

THE HIPPOPOTAMUS

(*Hippopotamus amphibius*)

Dorina, HAUSA; *Dul*, DANAKIL; *Gumari*, ABYSSINIAN; *Gerunt*, SUDANI; *Ikubu*, BASUTO; *Imvubu*, SWAZI; *Jir*, SOMALI; *Kiboko*, SWAHILI; *Macow*, MASAI; *Moubou*, WAGANDA; *Mourvu*, CHILALA; *Robi*, GALLA; *Tumunto*, M'KUA; *Zee-koe*, CAPE DUTCH.

(PLATE i, figs. 3 and 7)

While all the swine are grouped in a family (*Suidæ*) by themselves, the hippopotamus typifies a second and much smaller family (*Hippopotamidæ*), distinguished from the former by numerous and easily recognised characters, some of which are, however, of an adaptive

rather than of an inherent nature. Among the more striking features of these animals may be mentioned the clumsy, long, barrel-like body, the enormous head, with a broad, squared muzzle, and the short thick legs, each terminating in four toes encased in rounded hoofs, all of which touch the ground in walking. The hoofs of the middle pair of toes, unlike those of swine, are not flattened on their adjacent surfaces, and the outer pair is not disproportionately small. In the head notable features are the slit-like nostrils, placed rather close together on the highest part of the muzzle, the prominent eyes, which project above the plane of the face, and the small erect ears. The small tail is laterally compressed. Very conspicuous are the huge curved tusks in each jaw, between which, in the lower jaw, the large incisors project almost straight forwards. Very characteristic, too, are the cheek-teeth, the hind ones of which show a distinct trefoil-pattern on their grinding surface, while the last pair in the lower jaw has not the elongated form characterising the swine. With the exception of bristles on the muzzle, face, neck, and tail, the coarse and somewhat warty skin is bare. The hind angle of the lower jaw has a large descending flange terminating in front in a hook; such flange being quite unrepresented in the jaw of the swine.

Although restricted at the present day to Africa, where they are represented by two species — one large and the other small — hippopotamuses in former times had a wide distribution in the Old World. During the latest, or Pleistocene, geological epoch the larger African species flourished, for instance, in the rivers of Europe inclusive of England; while smaller species more or less nearly akin to the living pigmy hippopotamus abounded in the islands of the Mediterranean. Still earlier (in the Pliocene) there occurred in India, Burma, and North Africa other species with three pairs of lower front, or incisor, teeth of relatively small size.

The ordinary African hippopotamus is sufficiently characterised by its enormous bulk, and the presence of only two pairs of lower incisor teeth, of which the innermost is much larger than the outer pair.

Formerly hippopotamuses were to be found in all the larger rivers of Africa south of the Sahara, but they have long since been exterminated in the lower portion of the Nile valley, while they are yearly becoming scarcer in South Africa. That there are local races of the species can scarcely be doubted. Indeed, this was practically demonstrated by two individuals living in the Berlin Zoological Gardens in 1907, one of which had the lips, rings round the eyes and ears, and the folds at the point of insertion of the limbs and tail flesh-coloured, while in the other

they were lead-coloured. The discrimination of such races has, however, yet to be undertaken, although the name *Hippopotamus amphibius senegalensis* is available for the western representative of the species.

A full-grown hippopotamus will measure about 14 feet to the root of the short tail, and weigh at least 3 tons.

The following account of hippopotamuses in southern Africa is abbreviated, and otherwise slightly modified from one written by Mr. Selous in 1899. It will be noticed from this account that the colonial translation of the Boer name *zee-koe* is "sea-cow"; this, however, is incorrect, the proper rendering being, of course, "lake-cow."

In southern Africa, writes Mr. Selous, "the range of the hippopotamus has been much curtailed during the last century, not only by the encroachments of man, but also by the gradual desiccation of the western portion of the country. Natives now living remember the time when these animals were abundant in the Molopo river, where they could not exist at the present day; and Livingstone mentions that, according to native report, they used to inhabit the river flowing from the spring of Kuruman, which even in his time (1840 to 1850) had become a small stream. In Cape Colony and Natal the hippopotamus is now extinct; an old bull was long allowed to live in the Berg river at no great distance from Cape Town, but it became vicious and killed a boy, and so had to be destroyed.

"This was between 1860 and 1870, and in 1898 the fiat went forth for the extermination of the hippopotamuses preserved in Sea-Cow Lake near Durban, Natal, as it was found impossible to keep them any longer owing to the damage they did in the neighbouring sugar-plantations. Elsewhere hippopotamuses were, however, abundant not many years ago in every lake and river on the east coast, from Zululand to the Zambesi, along the greater part of the course of the Limpopo, and in almost every river in the vast territory between the latter and the Zambesi. They were also abundant in the Chobi and the Botletli. During various journeys I travelled along the course of the Zambesi for about 1000 miles between the Barotsi valley and the sea, but though I met with hippopotamuses in almost every part of the river, I found them really numerous only in two places—namely, near Sekhosi, about 40 miles above the junction of the Zambesi with the Chobi, and below the Kariba gorge, where I saw, in November 1877, over a hundred, in herds of fifteen or twenty, in less than a couple of miles. Hippopotamuses were formerly common in many of the rivers of Matabililand and Mashonaland, especially in the Umniati and its tributaries on the northern watershed, and in the Lunti to the south;

and till December 1893 a large herd frequented the deep pools of the Umzingwani river, about 40 miles south of Bulawayo. These were protected for many years by Lo Bengula and his father Umziligazi before him, and although one or two were occasionally shot, and their dismembered carcases brought by waggon to the head kraal of the king, none of his people were allowed to molest them without orders, under pain of death; they thus became very tame and confiding, and committed great havoc in the corn-fields of the natives living near the pools they frequented. Within a few months of the conquest of Matabililand in 1893, all, or nearly all, were destroyed by white men for the sake of their hides.

"Hippopotamuses are thoroughly nocturnal, and seldom feed except during the hours of darkness. They eat nothing but grass and reeds. In the day-time they retire to the deep pools of the rivers, or lie basking in the sun at the tail of a sand-bank, usually half immersed in the water, but sometimes lying high and dry on the warm sand. They are capable of standing a considerable amount of cold; the deep reaches on the upper courses of the Hanyani, Umfuli, and Umgezi rivers being formerly frequented by them all the year round, though the surrounding country is over 4500 feet above sea-level, and in winter the nights are so cold that if a basin of water be taken from the river in the evening there will often be a thick skin of ice on it the next morning.

"Unwieldy as the hippopotamus appears, it is a far more active animal than might be supposed; I have seen one gallop at a considerable speed, and at night they habitually travel long distances in some parts of the country in search of food. In walking, the hippopotamus moves the front and hind foot of each side in parallel lines, thus forming in soft or muddy ground two parallel tracks, divided from one another by a little ridge of sand or mud. The same paths are followed year after year, and often lead one in a bee-line across a bend in a river, from one deep pool to another, through miles of dense jungle, or over rocky, broken hills, into which one would imagine that no hippopotamus would ever venture. On the lower Umfuli river in northern Mashonaland there are places where the stream has cut a channel through beds of hard rock, enclosed between ranges of low stony hills, and in such situations the hippopotamuses have, in the course of ages, worn well-defined paths in the rock leading from one pool to another. These paths worn into the stone present exactly the appearance of a hippopotamus-track freshly made in soft ground, there being a low ridge of stone running down the middle corresponding to

FIG. 87.—Hippopotamus shot and photographed by Mr. Poulett-Weatherly in British Central Africa.

the ridge of mud in a modern track. In certain places on these rock-paths, where a sudden ascent had to be made to a higher ledge, the edges of the higher levels of hard rock are beautifully polished by the bellies of the numbers of hippopotamuses which, in the course of ages, have rubbed against them.

"Where hippopotamuses have never been fired at, they are tame, and even inquisitive. I once found a herd in a small rock-pool on the lower Umfuli river, the members of which had probably never seen a man with clothes on before, as they showed no fear whatever, but, as I sat on a rock at the edge of the pool, came up within a few yards, and remained with their heads in full view for a long time, staring stolidly at the unwonted sight, and continually twitching their little ears. In large rivers like the Zambesi, Shiré, or Chobi, where the hippopotamuses have been hunted by the natives for ages, they are usually wide awake, and often inclined to be vicious. Natives, indeed, endeavour to give them a wide berth when travelling with loaded canoes, and the mishaps that are continually taking place prove that they have reason for this caution. Canoes are doubtless sometimes overturned accidentally by hippopotamuses, as they rise to the surface to take breath, but old bulls and cows with young calves often attack canoes most viciously, and, after capsizing them, will sometimes pursue and kill by a bite one or more of their occupants. A hippopotamus-cow with a small calf attacked my canoe on the upper Zambesi in 1888; she first came up beneath it, throwing one end out of the water, then made a second attack, and, raising her huge head aloft, laid it across the canoe, which sank. This was in October, and the calf must have been newly born; but whether this is the usual time of year for these animals to calve, or whether they calve every year, I do not know. When very young, hippopotamus-calves seem to stand on their mothers' shoulders in the water, as sometimes a tiny head will be seen to appear on the surface and take breath, just before the head of the parent is raised a little in front. Hippopotamuses are usually found in small herds of from four or five to a dozen, but I have repeatedly seen as many as twenty, or even thirty in one herd. The old bulls often live alone, and are very noisy at nights; their loud grunting bellow being one of the most familiar sounds on an African river. Towards the end of the rainy season, about March or April in South Africa, both sexes become excessively fat, and the meat of a young cow in good condition is then exceedingly good, better, in my opinion, than that of any antelope. An old bull is always tough and usually lean. Hippopotamus-meat is dark red in colour, and in flavour more resembles beef

than pork. Europeans usually kill hippopotamuses by shooting them in the brain as they raise their heads above the surface of the water to breathe. It is as well to take time and try and make sure of the first shot, as, where they have been much persecuted, these animals do not give easy chances afterwards. Sometimes they will not show any part of the head except the great square snout, as they draw in breath through the nostrils; and sometimes they disappear altogether after the first shot, and never show themselves again, though the pool may be watched for hours. In such cases I believe they raise their nostrils above the water in the shelter of some overhanging bush, and lie there breathing noiselessly until dark, when they leave the pool and travel

FIG. 88.—Hippopotamuses in the Juba River, photographed by Lord Delamere.

up or down river to a safer locality, perhaps 20 or 25 miles away, a distance which they can cover in the course of the night. Once while trying to shoot a hippopotamus in the Zambesi—the one which capsized my canoe—I took the times with my watch, during more than an hour, that it remained under water in the intervals of breathing. The shortest time was forty seconds, and the longest four minutes and twenty seconds; the usual time being from two to two and a half minutes. The creature always remained longest under water after having been fired at, though on such occasions it must have gone down without having taken a full breath. When killed by a shot in the brain, a hippopotamus at once sinks to the bottom; and if the water is cold and deep the carcase will not rise to the surface for six hours, or some-

times even longer, although if the water is warm it will float in about three hours. Natives armed with guns shoot, as a rule, too badly to be able to hit hippopotamuses in the brain as they lie in the rivers during the day-time; but they kill a good many by shooting them in the body as they come out to feed at nights.

"When they have no guns, natives kill hippopotamuses in various ways. Pitfalls are dug in their paths, or traps set over them; but the animals become wonderfully cunning, and but few, I believe, are killed by these means. On the Zambesi and other large rivers many are harpooned, but the cruellest and at the same time the most destructive method of killing them I ever heard of was formerly practised by the natives of northern Mashonaland, who used to starve entire herds to death. To accomplish this, a whole tribe would co-operate, and, having found a herd of hippopotamuses in a suitable pool, would fence it in, and, by keeping up fires all night and beating drums, prevent the imprisoned animals from breaking out, and thus slowly starve them. Once, while journeying along the course of the Ummati river, I came upon a tribe engaged in destroying a herd in this way. When I reached the scene of operations there were still ten hippopotamuses alive in the pool, of which eight were standing on a submerged sand-bank with more than half their bodies above the water, all huddled together with their heads resting on each other's bodies. Two more were swimming round, each with a heavy assegai sticking in its back; while several must already have been killed or starved to death, as an immense quantity of meat was hanging in festoons on the trees round the pool. From what I could learn, this pool had been enclosed for about three weeks, during which time the natives said that the animals had nothing to eat."

The following notes, by Mr. T. E. Buckley, relate to the hippopotamus in East and North Africa:—

"North of the Zambesi there are no rivers of any size in which hippopotamuses do not exist. In the Zambesi itself they are abundant, though not so numerous as formerly in the lower part, owing partly to shooting, and also to increased traffic. In the Shiré river they at one time constituted a source of danger, being very vicious, and fond of pursuing and upsetting canoes, so that their destruction up to a certain point was encouraged. Indeed, few travellers who have done much canoe-work where these animals abound have escaped their attentions; the aggressor being sometimes an old bull, at other times a cow whose maternal fears for her young calf have been aroused. A wounded hippopotamus will often charge the boat from

which the shot that wounded it was fired; and occasionally, when the sportsman has been close to the water's edge, these animals have been known to leave the water and charge for a short distance. Hippopotamuses are equally at home in salt and in fresh water; and the brackish water at the mouths of many East African rivers, as for instance the Zambesi and Pangani, is a favourite resort.

"Some African lakes, such as Lake Chilwa, partake more of the nature of a marsh than of an actual sheet of water, their extent and depth varying according as the season is wet or dry. In Lake Chilwa it would seem as if hippopotamuses were only visitors, coming at certain times of year, and travelling overland from the Shiré river. Lakes Mweru, Bangweolo, Nyasa, and Tanganyika all contain these animals in more or less abundance. Another of these shallow, swampy places, more marsh than open water, inhabited by these beasts is Ngiri, lying to the north of Kilimanjaro. Here huge papyrus-reeds come up to the edge of the dryer ground, and amongst this tangled mass the grunting of the hippopotamuses may be heard by day; while at night the creatures leave their covert to wander in the open space round the camping-ground. They are abundant in Lake Jipé near Kilimanjaro, but are said to be inferior in bulk and in the size of their tusks to those met with in the rivers. Mr. F. J. Jackson considers that the hippopotamuses on the Athi river have finer tusks than those from any other locality in this part of Africa. That gentleman found them more numerous in the river Nzoia in northern Kavirondo than in any other place. In every other lake in East Africa—Naivasha, Baringo, Victoria, Rudolf, and Stephanie—hippopotamuses are found in abundance, as well as in all the rivers as far north as the Guaro Nyiro. Between this and the Shebeyli river, which runs south of the Ogaden, the country is [1899] little known to Europeans, but in that river they again appear.

"In the Nile it is doubtful if any exist in the main stream below Khartum; but in the Abyssinian tributaries, such as the Atbara, and again in the minor tributaries like the Sittité, Salaam, and Royan, the species is (or was) to be found."

A hippopotamus shot by Mr. Vaughan Kirby on the Shiré river measured 14 feet 2 inches in total length, of which 20 inches was taken up by the tail; the shoulder-height being 3 feet 10½ inches. The record lengths for the lower tusk are 64½ and 51 inches; the respective girths of these specimens being 7¼ and 9 inches.

THE PIGMY HIPPOPOTAMUS

(*Hippopotamus liberiensis*)

Mali, VEY

(PLATE i, fig. 4)

Of the pigmy or Liberian hippopotamus, which appears to be confined to the west coast, a very brief notice will suffice. From its gigantic relative it is distinguished, in the first place, by its comparatively small size (total length about 6½ feet), and secondly by the general presence of only a single pair of lower incisor teeth. In build the creature is stout and "podgy"; while in colour it is stated to be greenish blue-black above, and greenish or yellowish grey beneath.

According to the accounts of the few Europeans by whom it has been seen alive in its native haunts, the pigmy hippopotamus has more the habits of a pig than of a typical hippopotamus. In place of frequenting rivers in herds, it associates only in pairs, and spends most of its time on land in the forests, seldom entering the water except for the purpose of bathing or when about to cross a river. Each pair is stated to wander over a large tract of territory, where no others of the species appear to intrude; a circumstance which, if true, indicates the rarity of the creature.

In habits the pigmy hippopotamus, like its monster cousin, is purely nocturnal, sleeping so heavily during the day that it may be approached with comparative ease, and at night wandering about the forests and marshes in search of the young shoots, fruits, and grass which form its nutriment. Its foot-marks are broad and deep, recalling those of a young elephant; and in soft muddy ground an additional trail is made by the body touching the ground. The flesh is stated to be very similar in character to that of wild swine.

The following are the dimensions of a pigmy hippopotamus shot by Captain Murray near Salon on the Mauwa river about two miles from the Liberian frontier, on January 22, 1908:—

Length from nose to tip of tail	78½ inches.
Length of tail	7½ ,,
Length of fore-leg	17½ ,,
Length of hind-leg	19½ ,,
Height at withers	37 ,,
Height at rump	35½ ,,
Girth at middle of body	61 ,,
Girth behind shoulder	56 ,,

Weight about 600 lb.

THE LION

(*Felis leo*)

Ambassa, ABYSSINIAN ; *Asced*, ARABIC ; *Ibulubesi*, MATONGA AND MASHANGA ; *Imbubi*, *Ibubesi*, AND *Ingonyama*, SWAZI AND ZULU ; *Karamo*, M'KUA ; *Lendja* OR *Lendjandnek*, GALLA ; *Leeuw*, CAPE DUTCH ; *Libba*, SOMALI ; *Libbaka*, DANAKIL ; *Lugwaru*, NDOROBO ; *Nkango* OR *Nkalamo*, CHILALA AND CHIBISA ; *Simba*, SWAHILI ; *Tau*, BASUTO AND BECHUANA ; *Tauw*, BAROTSI AND NGAMI ; *Zaki*, HAUSA.

All the animals referred to in the preceding pages are members of the great order Ungulata, or hoofed group, in which the toes (seldom more than four in number) are either encased in hoofs or protected by flat, hoof-like nails. With few exceptions, the species remaining for consideration belong to the Carnivora, in which the toes (often five in number on the fore-feet) terminate in sharp claws. Other important characteristics are afforded by the teeth, which are more or less modified for the needs of a diet composed largely or exclusively of flesh ; one characteristic feature of the land-members of the order being the pair of so-called flesh, or carnassial, teeth in each jaw, which bite against one another, and in the more advanced types have an action comparable to that of the blades of a pair of scissors.

The members of the cat tribe, or *Felidæ*, which include the lion and the leopard, may be regarded as the most advanced type of Carnivora, as is attested by the short and rounded head, the reduced number and highly modified characters of the teeth, and the strongly curved claws, which can be more or less completely retracted within special protective sheaths. The carnassial teeth have a perfect scissor-like action. The total number of teeth is 30, of which 16 belong to the upper, and 14 to the lower jaw. The carnassial in the upper jaw is a premolar (that is to say it has a milk-predecessor), and has a small molar behind it, whereas in the lower jaw it is a molar (having no milk-predecessor), and has no tooth behind it. The reduction of the molars to a single pair in each jaw is very characteristic of the *Felidæ*, as is also the circumstance that the three pairs of incisors, or front teeth, in the lower jaw are placed in the same transverse line. In the upper jaw the carnassial tooth has three lobes to its cutting blade, and a small tubercle on the inner side ; but the lower carnassial consists only

of two trenchant lobes. All the members of the family walk entirely upon their toes, and are accordingly termed digitigrade; the front-toes being four and the hind ones five in number.

In the more typical members of the family, that is to say, all except the hunting-leopard, the claws are capable of complete retraction within protective sheaths. The general appearance of these animals being well known, need not be described in this place; while a brief summary of the external characteristics of the lion will suffice.

The lion, one of the two largest members of the *Felidæ*, is typically distinguished by the absence of spots or stripes in the adult, the mane of long hair on the head and fore-quarters of the male, and the tuft of hair at the tip of the tail, in which is concealed a small nail-like appendage of unknown use. The tail-tuft is always black, as are the bases of the ears, but it is only in some males that the tips of the hairs of the mane are black: individuals with dark and light manes occurring in the same litter. The young generally show dark spots; and in East African lions spots may be retained on the limbs, under-parts, and flanks throughout life, especially in the lioness. In the Somali lion (*Felis leo somaliensis*), which is a small and frequently greyish animal, these spots are, at best, faint; but in the female of the Masai lion (*F. l. masaica*), fig. 90, of German East Africa, they may be strongly marked. Lions extend from Africa through Syria and Persia to India, where they are now restricted to the Gir Forest of the Khatiawar district. When adult they do not, as a rule, climb; and they are the most noisy of the cat tribe, roaring in districts where they are little disturbed throughout the night. Chiefly nocturnal, they prefer more or less open sandy districts; and their prey includes antelopes, zebras, pigs, and sometimes giraffes. Old lions feed on the smaller domesticated animals, and carrion is seldom refused by any lion.

In the skull of the lion the upper extremities of the nasal bones and of the upper jaw-bones, or maxillæ, are nearly in a horizontal line; whereas in the tiger the nasals extend considerably higher up on the forehead than the maxillæ. The lower jaw of the lion is convex inferiorly so that it will rest on a horizontal surface; while that of the tiger is concave in the middle so that it rests on the two extremities.

As already mentioned, lions from East Africa retain more or less distinct traces of the spots of their childhood even when full grown; and it is thus quite evident that both lions and pumas are descended from fully spotted ancestors. By an examination of the form and arrangement of the spotting in the cubs of the two species, Mr. R. I. Pocock, in the *Annals and Magazine of Natural History* for 1908

(ser. 7, vol. xx. p. 436), has endeavoured to ascertain the nature of the markings of their respective forebears. In the case of lion-cubs, the author shows that the pattern of the markings is intermediate in character between the stripes of the tiger and the rosette-like spots of the leopard, although inclining perhaps more to the former type. Another distinctly tiger-like feature in the lion-cub is the presence of a white patch over the eye, which disappears in the adult. As regards the stripes of the tiger, these certainly seem to be derived from the rosettes of the leopard, the double striping frequently seen being a remnant of the rosettes. If these conclusions are correct, it is clear that lions, tigers, and leopards (and, it may be added, jaguars) form a closely allied group.

Puma-cubs, on the other hand, present a pattern quite unlike that seen in any of the foregoing, and thus indicate the marked distinctness of the American *Felis concolor* from the lion and tiger group. Pumas may accordingly be regarded as large, uniformly-coloured derivatives of one of the groups of smaller, and probably American, cats.

In this place reference may be made to a lion's skull in the British Museum (Natural History) entirely lacking lower canine teeth or tusks. It was received among a number of other lion skulls and skins from East Africa at the establishment of Mr. Rowland Ward, where the abnormality was first detected. There is no trace whatever of even the sockets of the lower canines, which were evidently never developed at all, but in other respects the dentition is perfectly normal. When rending its prey and stripping the meat from the bones, the animal must apparently have relied solely upon its incisors, as the upper canines, having no teeth to oppose them, must seemingly have been more or less useless. It would have been interesting to know whether during life this lion was as well nourished as its fellows. The skull, although adult, is of rather small size. This is the only instance of an abnormality of this description that has come under my notice. Partial or complete duplication of the upper canine seems, on the other hand, to be not uncommon in the dog family. Some years ago, for instance, a fox's skull with completely double canines on both sides of the upper jaw was figured in the *Field*. A precisely similar condition obtains in a skull of the African long-eared fox (*Otocyon megalotis*) exhibited in the Natural History branch of the British Museum, where there is also an English fox's skull with both upper canines cleft for the greater part of their length.

The African lion may be divided into the following seven local races :—

Typical race, *F. l. typica.*—Colour yellowish red, with the mane well developed on neck and breast, but none on the under-parts. Habitat, unknown.

Barbary race, *F. l. barbara.*—Very large, dusky ochery, with the mane very thick and long, extending to the middle of the back; and a thick and heavy mane on the under-parts. In the female the inside of the fore-legs is white. Habitat, North Africa.

Southern race, *F. l. capensis.*—In this race the colour was dusky yellow, the mane enormously long, thick, and black; a mane present also on the under-parts; long and thick ears; size larger than in the preceding race. Habitat, Cape Colony. Extinct.

Senegal race, *F. l. senegalensis.*—Medium-sized; reddish yellow in colour, with the mane feebly developed, absent from the shoulders, and running to a point on the withers. Habitat, Senegambia.

Masai race, *F. l. masaica.*—In this race the mane ends abruptly between the ears in a straight line, above which it is formed for some distance by short yellowish-red hairs; and the tail-tuft is slender and sharp. The adult female (fig. 90) is marked on the under-parts, flanks, and inner sides of the limbs with large chocolate spots; and the lion is also spotted in much the same manner, although its dark ground-colour obscures the markings. Habitat, German East Africa.

Somali race, *F. l. somaliensis.*—Rather small, with very large ears, a very long tail, colour pale yellowish grey, often more or less spotted, the mane not covering the shoulders; no mane on the under-parts. Habitat, Abyssinia and Somaliland.

Western race, *F. l. kamptzi.*—General colour ochery; dun on the under side, up to the top of the thighs yellow, not white. Habitat, Cameroons and Adamowa.

Of these, the Barbary, southern, and Senegal races were named many years ago by the German naturalist Fitzinger. The Masai race was described in 1900 by Mr. O. Neumann in the *Zoologischer Jahrbuch Systemat.* vol. xiii. p. 550; the Somali race by Professor T. Noack in the *Jahrbuch Hamburg. Wiss. Anstalt.*, for 1891, p. 48; and the western race by Dr. P. Matschie in the *Sitzungs-Berichte Ges. Naturfor. Berlin*, 1900, p. 98.

As regards dimensions and weight, Mr. Vaughan Kirby considers that 9 feet 6 inches, measured along the contour, is an average length for a good male lion, of which the weight will range between 400 and 500 lb. The record lengths of lions, before skinning, are 10 feet 7 inches and 10 feet 5 inches. Forty inches at the shoulder may be given as the standing height of an average full-grown lion.

The following notes on the lion in South Africa are condensed from an account written by Mr. F. Vaughan Kirby in 1899:—

"Lions have an inborn dislike to man's presence; and therefore, if encountered in the daytime, usually give way, perhaps after a moment's survey of the intruder, accompanied by a growl and a flourish of the tail. They often make a demonstration to frighten any one who disturbs them at a carcase, but it is more bark than bite, and, if faced firmly, they will retire, growling. There are many exceptions, however, and a savage or hungry lion, or lioness with cubs, will charge without hesitation. Essentially nocturnal in their habits, lions are justly dreaded at night, when they become bold, fierce, and aggressive; and, as they generally make use of game-tracks or foot-paths when moving, the risk of walking along these at night in districts infested by lions is very great. A lion is seen at his best (or worst) when at bay, standing with lowered head and crest erect, his tufted tail twitching, his lips drawn back from the red gums and great white fangs, and living fire flashing from his eyes, while he keeps up an incessant hoarse growling. I think no animal can look more utterly savage than a lion under such circumstances, and the sportsman who faces him must 'hold straight.' To follow a wounded lion into thick covert is a dangerous proceeding, and calls for the utmost coolness and nerve, as the animal invariably sees the sportsman before it is seen by him, and in most cases charges. The roar is one of the most marked characteristics of the lion; and, when heard at night pealing through the forest, is inexpressibly grand—almost, if not quite, the most sublime sound in nature. When several lions are roaring in concert, near the listener, the volume of sound is tremendous, the air vibrating and the ground trembling. Heard amidst the uproar of a tropical night's storm, when the lightning's flash rends the sky in twain, leaving pitchy blackness behind, it is truly awe-inspiring.

"The steady march of civilisation in South Africa has considerably limited the range of the lion; and as the vast herds of game upon which it depended for food have been swept away, it has been forced to retire into remoter regions. From much of the South Africa of Gordon Cumming it has vanished completely; while many parts of Mashona-Matabililand and the Transvaal will never again resound with its mighty voice. A few lions linger in Zululand, Swaziland, Amatongaland and the Libombo range; and they are still numerous in the wilder parts of Rhodesia, Ngamiland, Khamaland, along the Limpopo river, and in the Matamiri bush. In Umliwan's country, along the Buzi river, in the Pungwi and Chiringoma districts of

Portuguese East Africa, particularly near Jakota, which is infested with them, they are probably more numerous than in any other part of South Africa.

"Lions drink once daily, either between 6 and 9 P.M. or between 3 and 6 A.M., but sometimes oftener in hot weather; after a full feed at night they invariably drink before seeking their lairs, and if the kill is near water, they drink at frequent intervals during a meal. Their lairs may be almost anywhere—in a dense reed-bed, an impenetrable thorn-thicket, a hollow full of long grass, or under any thick patch of bush; but only in quite undisturbed country do lions lie up by their 'kill' during the day. They roar loudest on dark frosty nights, and seldom on bright moonlight nights and in sultry weather. In disturbed districts they become very silent at all times, and utter no sound when prowling. In wet cloudy weather they are very restless, and often travel great distances; and in such weather I have often heard them uttering low muffled moans throughout the day. It is at such times that they are most likely to attack a camp. Two, three, or four lions are more frequently encountered than solitary individuals, and larger numbers often band together for mutual assistance in securing prey. The largest troop I ever saw numbered twelve individuals; but I have heard of fifteen. Lions kill hornless animals and small antelopes by biting them in the throat or at the back of the neck; but larger antelopes may be rushed from in front, seized by the throat and thrown back on to the haunches, thus frequently dislocating the neck, and sometimes breaking a leg. Heavier animals are often dragged down by the flanks, or are seized by the shoulders, and the nose clutched and dragged down by one paw; the first mad forward plunge of the victim bringing it down on its head, when the neck is at once broken. Once I saw a lion pull down a wounded buffalo bull in this fashion; but I never met with an instance of a lion deliberately killing an animal with a blow of its paw, although I have witnessed proof of the terrible strength of such a blow. In chasing its prey a lion, however, often strikes a disabling blow over the loins or on the hind-leg; and I have seen a wart-hog, a hyæna, and several impala thus struck down. When lions have secured a 'kill,' they disembowel it neatly, through an opening in the flank, and then bury the entrails, which are very rarely eaten. The ears are often bitten off, and the tongue torn out. The heart and lungs are first eaten; then the soft flesh of the buttocks or inside of the thighs is torn off and bolted in great mouthfuls with pieces of skin attached; while the brisket and adjacent soft-parts are devoured last, if the animal is fat. When

leaving the carcase, lions often cover it with rubbish, leaves, etc., and on their return almost invariably drag it to another spot, even if it is moved only a few yards. A hungry lion will eat almost anything; and I have taken a porcupine's head and portions of a large rat from the stomach of a lioness. It is not uncommon to find lions with porcupine-quills stuck all over the nose, face, and paws, and I have seen a lioness completely blinded with them. A young or lightly-built lioness is capable of climbing a tree, and there is an instance of a young male climbing into a low bushy tree, although such a feat would probably be impossible to a full-grown male lion. I once measured the distance covered in a single spring by a heavy lioness, from a bank 4 feet high, which was 21½ feet; but this seems to have been an unusual exertion.

"Lions never carry even the smallest antelope clear of the ground, but seize it by the head or neck and drag the carcase; and, as a matter of fact, it is a physical impossibility for so comparatively low-standing an animal as a lion to lift and carry even an impala clear of the ground, much less an ox or even a calf, to say nothing of leaping a fence with such a burden. Lions, indeed, seldom leap any fence, but wriggle themselves under or force their way through. They never suck the blood of a victim, although they will eat the clotted blood which collects inside a carcase. They are cannibals on rare occasions, and like their meat not only high, but in an advanced state of putrefaction, and prefer it to be killed for them. Man-eaters are rare in South Africa, and I have only met one, a cunning old lioness, which I finally shot. Lionesses have no fixed breeding-season; but the cubs are generally born in March and April, two or three being the usual number in a litter, although there may be four. Their eyes are fully open at birth; and they are barred on the body with transverse stripes, and thickly spotted on the limbs. The fur is thick and woolly. At from five to six months old they accompany their mother in search of prey; and game is fearfully mangled by young lions of ten or twelve months old, when undergoing tuition in the art of killing under their parents' eyes. Comparatively few male cubs reach maturity; hence the disparity between the numbers of each sex. The males are said to be monogamous; but as single lions are often seen with two or three lionesses, and the relative numbers of the two sexes is so disproportionate, I regard the statement as open to question.

"Lions may be systematically hunted in three ways: by visiting their own 'kill' or a placed bait between dawn and daylight; by night-watching at a bait or 'kill'; and by tracking them to their lairs

during the day. The latter method may be dismissed by the statement that disappointments will be numerous, for over ordinary country it is extremely difficult to follow such light-treading animals, and, if put up many times, they become extremely wary. The best plan is to stalk them at dawn, having marked the lie of the ground near the bait, so as to be able to approach within range before daylight, and with the wind from any direction. If it is their own 'kill,' a shot is almost a certainty, but a placed bait may not, of course, have been found. Under any circumstances, the chances are improved by dragging the bait across several game-tracks on the previous evening, and by placing it near water, which invariably tempts a lion to stop an hour later than he would otherwise. If hyænas are numerous, the bait must be placed in a tree at least 8 feet from the ground; and if the sportsman arrives late at a bait, he should watch the vultures, and note whether some are sitting in the trees and others flying over them, evidently afraid to settle; this being a sure sign that some kind of wild beast is at the bait.

"Watching at night is intensely exciting; but it is very difficult to make out an animal on the ground below you. The best plan for night-watching is to place the bait in a shallow creek and make a shelter of branches on the bank, 20 feet from the bait, below wind; the bait having been previously dragged in such a way that a lion coming along the track will be seen, at any rate a few moments before reaching the carcase. If dealing with their own 'kill' the sportsman should note the direction of the departing spoor, and build his *scherm* accordingly, remembering that lions are nearly sure to return along the same track. Or a shooting-hole may be dug and covered with logs and thorn-branches: this should be $5\frac{1}{2}$ feet long, 4 feet wide, and 3 feet to 4 feet deep, and a hole must be left through which to shoot. Moonlight should be chosen for night-watching, otherwise it is difficult to make out a lion even when only six or eight paces distant."

The following notes on the lion in British East Africa are condensed from material supplied in 1899 by Mr. A. H. Neumann:—

"Lions have frequently invaded the island of Mombasa (probably crossing at low spring-tides when the channel is fordable at one point), and attacked the cattle kept for slaughter. Several have been killed there at different times; the last instance occurred when a lioness was shot by a native with a bow and arrow, and its body was afterwards dragged through the town. In the interior they are sometimes seen in large troops in their favourite resorts. Mr. F. J. Jackson, for instance, once came across twenty-three together near Machakos; while I

myself have seen a party of about fifteen to the north-east of Mount Kenia. Many of the lions are maneless or have insignificant manes, but there are also fine maned specimens to be found. Whether local conditions—such as elevation and climate—have anything to do with this difference, or whether it is merely individual, I am unable to decide; but it seems to be the case that while maneless lions are commonly small, the full-maned specimens are much finer animals. In East Africa man-eating lions seem commoner and more troublesome than in any other part of the continent, and rival in their destructiveness

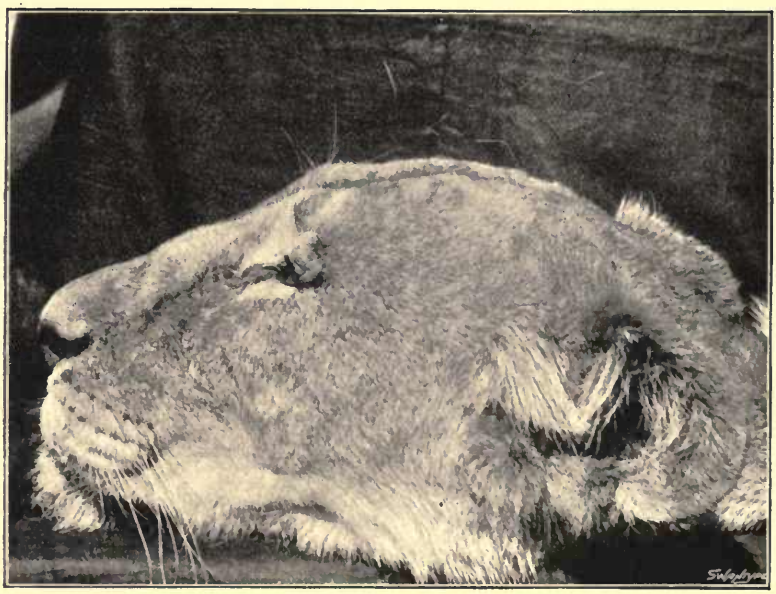


FIG. 89.—Head of a North Somali Lioness, photographed by Lord Delamere.

the man-eating tigers of India. The reason of this is, I think, not difficult to explain. In South Africa, so soon as a lion takes to preying even on the cattle of the natives, let alone on the natives themselves, the whole male population of the neighbourhood turns out and hunts him down. Zulus, Swazis, and kindred tribes were accustomed to do this with their spears long before fire-arms came into their hands; and consequently the predatory habit, when turned in this direction, was nipped in the bud. Many of the tribes of Central Africa are, on the other hand, either more timid, or, being few and scattered, lack the cohesion necessary to initiate such a stamping-out policy. Hence the

man-eater, having once acquired the taste for human flesh, and overcome his awe of human beings, perseveres in his evil course, getting bolder and bolder, till he becomes the terror of the country-side. It is possible even that a race of man-eaters may be developed, for I have known of a particular locality being reputed dangerous from that cause for more than a generation.

"On parts of the Uganda road straggling porters have for years fallen victims to lions; and the loss of life from this cause among the Indian coolies employed as navvies on the railway was so serious that at one point, not far from the Tsavo river, where between twenty and thirty had fallen victims to two man-eaters, the work was considerably retarded by the labourers refusing to remain. Lions have also been known to enter dwellings; at least one European has been taken out of his tent and killed by one of these animals; while one of my own gun-bearers lost a brother by a lion which forced its way into his hut near the coast and carried him off."

A fuller account of the lions on the Uganda railway has been subsequently given by Colonel J. H. Patterson, the engineer in charge, in the *Man-Eaters of Tsavo*, from which the following items are taken.

The task of constructing the Uganda line entailed the engagement of some 3000 Indian coolies, who were distributed among various camps as the work required; and it was these men who furnished food for the lions which, as it proved, had their den close by. Colonel Patterson had a difficult task when he determined to rid the neighbourhood of the man-eaters, for they seemed to realise that their only chance of escape lay in attacking a different camp each night, so that attempts to kill them from platforms were almost hopeless. The Tsavo man-eaters were only two—maneless males—but these killed a coolie nearly every night; and during the nine months the reign of terror continued the change in their practice and methods was clearly observed. The first endeavours of these lions were by no means always successful; they were bold enough from the beginning, but at the critical moment they did not always rise to the occasion. On one occasion, for instance, a lion broke into the tent of a contractor, and seized and made off with, not the man, but the mattress on which he was lying. Another night a lion sprang through the tent in which fourteen coolies were sleeping and seized a bag of rice, which was carried for a little distance and dropped. As time went on the lions ceased to make such blunders, and went about their deadly work with the coolness and temerity which come of practice. They appeared, indeed, to study the conditions under which they had to work, and

refused to be deterred by devices which would scare them under ordinary conditions. Fires were blazing all night, and the watchman kept up a continual clattering of kerosene-tins hung up for the purpose; but all these were of no avail, and the lions somehow contrived to make their way noiselessly through the dense thorn *zariba* round the camps and, defying noise and glare, carried off their victims. At first the attack was always made by a single lion, its mate waiting outside the fence to share the meal; but with fuller experience this method of hunting was abandoned and both lions attacked simultaneously, each taking its own victim. It would seem, indeed, as though the two

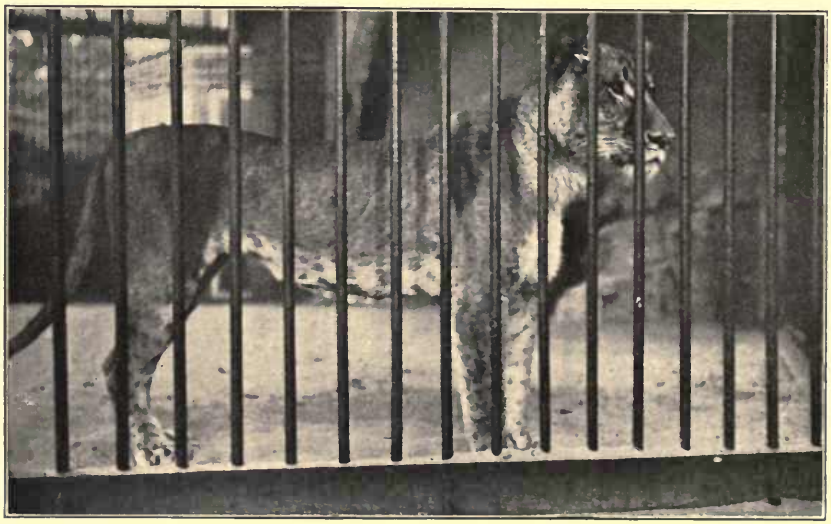


FIG. 90.—Masai Lioness in the Berlin Zoological Gardens, from a photograph supplied by Dr. Heck.

worked on a concerted plan: one keeping watch for a foe, while the other did the work, until it was realised that they could do without the sentry and both accomplish active work. They thus acquired complete contempt for the unfortunate coolies. On one occasion a lion forced its way through the fence, regardless of sticks, stones, and firebrands, and killed a man whose body it dragged away: when once outside the thorn-fence it was joined by its mate, and the two actually devoured the victim within thirty yards of the tent whence he had been seized, while the chief of the guard fired several shots at them. The attack was invariably made in complete silence. Every night the roaring of the lions was heard gradually drawing nearer,

then it would suddenly cease, and the listeners knew that the stalk had begun. Colonel Patterson states, indeed, that he never experienced anything more nerve-shaking than this nightly roaring followed by the silence whose purport he had learned to know only too well: the silence being even more trying to the nerves than the roaring.

Traps and poison were tried without avail, the lions seldom looking at such bait as a donkey or goat; but eventually, after "lion-proof" camps had been arranged, the coolies placing their beds on water-tanks, trees, or other safe spots, the lions resorted to other prey, and thus brought about their own destruction. Probably, however, no sportsman has had a worse two hours than Colonel Patterson, who, while sitting over the carcase of a donkey, discovered that a lion, utterly ignoring the bait, was creeping slowly round and round the flimsy structure of poles which supported his platform. This lion was shot and proved to be one of the two man-eaters, while the second was killed a few nights later over goats. This second lion on the same occasion actually dragged for a distance of about a quarter of a mile a half-length of rail weighing 250 lb., to which were attached two other full-grown goats in addition to the one he killed. Bold and calculating as these man-eaters became, they appear, however, never to have attacked by day, though opportunities of pouncing upon coolies working on the new line in the dense bush must have been comparatively frequent.

In northern Africa, according to Sir H. H. Johnston, lions were to be met with in the north of Tunisia up to the date of the French invasion in 1881, and a couple of centuries ago were common throughout the country. They had full manes, and a rich, dark, tawny-coloured fur.

In Algeria Mr. A. E. Pease, writing ten years ago, states that the "lion has become so rare that it may be said to be nearing extinction. Contrary to the general fate of the larger game, it lingers only in the country that might almost be described as the Mediterranean littoral zone, though an occasional lion is still shot or tracked in the interior, as far inland as the district of Soukarras, and certain places in the Aures. In 1892-93 one or two were killed within a day or so of Batna, but during the time I was in the country (1892-95) I hunted almost the whole Aures range from the Melliti to Tunisia and never saw a track, and I do not remember hearing of more than three or four lions being obtained in the whole province of Constantine. In the provinces of Algiers and Oran they may be said to be extinct. Indeed, so long ago as 1862 General Merguerite wrote that he had spent eleven years in the best lion-countries in the province of Algiers,

when the average number killed did not exceed three or four a year. In those days lions were found in the wooded belt of hills between the Ouarsenis on the west, the Pic de Taza on the east, the Djebel Ennedate on the south, and the plain of the Chélif on the north; but it was estimated that of these only two-thirds were natives, the remainder coming from Dir-Gueyoul, Djebel-Dira, and Zakkar. That the majority of the population does not mourn the absence of the king of beasts may be gathered from the fact that during eleven years the Beni-Mahrez, a tribe numbering not more than 100 tents, lost on an average annually 3 horses, 25 cattle, and 75 sheep from the depredations of lions and leopards. Jules Gérard, the great Algerian lion-hunter, calculated that each lion levied during a life of thirty-five years, on an average, taxes amounting to £8400 on the population. Little wonder that the French Government gave a capitation-fee for the destruction of lions; but before the French came the Turks encouraged the Arabs to destroy them by freeing the two great lion-hunting tribes—the Ouled Meloul and Ouled Cessi—from taxes, and paying liberally for the skins secured. A few lions are still left in the province of Constantine in the thick forests between Soukarras and La Calle; but they are rarely seen, and a hunter might spend a month before coming on a fresh track. The Algerian lion seems to have been justly accredited in the old days with greater courage and audacity than his relatives, but he now keeps clear of man and flies even from an unarmed native. At the present day it is rare for a lion to attack the flocks and herds of the Arabs, and he never springs as of old into the fold; he lives by hunting, the wild boar and the red deer being the chief contributors to his support. Gérard, the 'Tueur des Lions,' killed thirty lions between 1848 and 1856."

THE LEOPARD

(*Felis pardus*)

Harvard, M'KUA; *Ingwi*, ZULU, SWAZI, MATABILI, AND MATONGA; *Inkwi*, BECHUANA AND BASUTO; *Ngo*, WAGANDA; *Nyalugwi*, MANGANJA; *Shabel*, SOMALI; *Siveri*, ALOMWI; *Tijger*, CAPE DUTCH.

(PLATE XV, fig. 1)

The leopard, or panther, as being the only large spotted cat in the Old World, requires nothing on the present occasion in the way of

description. The species, inclusive of a number of more or less marked local varieties or races, has an extensive range in Asia, and, except where it has been exterminated by human agency, inhabits all parts of Africa suitable to its existence. The typical representative of the species is the Indian leopard; and consequently all the African races, which are by no means yet properly determined, require separate subspecific names.

In the volume of the *Fauna of British India* devoted to mammals it was stated by Dr. W. T. Blanford that most African leopard-skins can be distinguished at a glance from Indian skins by their very much smaller spots. Although this statement may be literally true, it must not be taken to imply that all African leopards are small-spotted. On the contrary, large-spotted leopards, approximating more or less closely to Asiatic types, are to be met with over a considerable portion of northern and eastern Africa. The most western of these large-spotted races appears to be the Atlas leopard of Morocco and the neighbouring countries, which is the largest representative of the species. Although specimens are lacking in the British Museum, there is a figure of a Morocco leopard on p. 234 of J. Greenwood's *Wild Sports of the World*, the authenticity of which it would be rash to deny. It represents a powerfully built animal with large spots, and as much white on the under surface as is usually seen in leopards. In Dr. E. Trouessart's *Catalogus Mammalium* the Atlas leopard is called *Felis pardus antiquorum*. Of the type specimen of that race there is in Griffith's *Animal Kingdom* (1827) a good description and figure. The author of that description, Colonel Hamilton Smith, pointed out that this leopard differed from all others known to him in having the under-parts, not white, but buff-yellow, and only a shade lighter than the sides of the body. This, as mentioned by Mr. R. I. Pocock in the *Field* of December 14, 1907, is a feature in which this leopard resembles lions, and differs not only from others of its species, but also from jaguars and tigers. There seems, however, to be no evidence that the animal in question came from Morocco or the adjacent countries. On the contrary, its describer expressly stated that it was a stuffed menagerie-specimen of which the locality was unknown. It thus seems that while the leopard of the Atlas has no scientific name, a claimant is wanted for the title of *Felis pardus antiquorum*.

Next on the list comes the leopard of the Red Sea littoral, conveniently known as the Erythrean race (*F. p. nimr*), which is stated to be a greyish animal, approximating in colour, and perhaps in markings, to the Caucasian and Persian leopard.

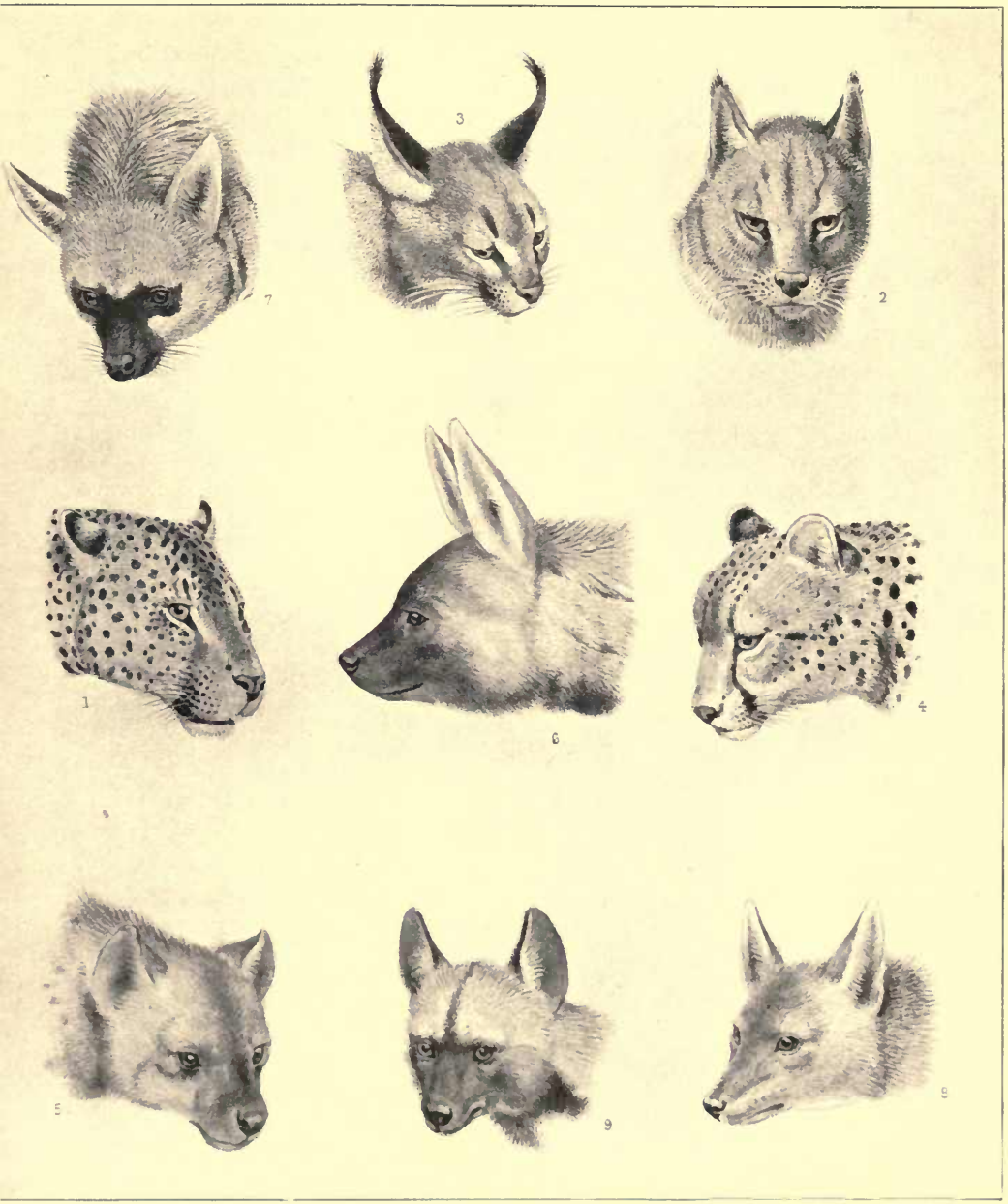


PLATE XV

1. Leopard.
2. Jungle-Cat.
3. Caracal.
4. Hunting-Leopard or Chita.
5. Spotted Hyæna.
6. Striped Hyæna.
7. Aard-Wolf.
8. Culberow.
9. Hunting-Dog.

Another large-spotted race (*F. p. suahelica*), first described by Mr. O. Neumann in the *Zoologischer Jahrbuch Systemat.* for 1900, vol. xiii. p. 551, inhabits German East Africa, whence it apparently extends into Uganda. A specimen living some time ago in the Zoological Gardens at Berlin is figured on p. 180 of Dr. Heck's *Lebende Bilder aus dem Reiche der Tiere.* The body-spots are in the form of distinct rosettes, like those of an Indian leopard, but the rosettes themselves may be more approximated, and appear to have the centres less dark, and thus more like the general ground-colour. No black dots occur in the centres of the rosettes. Such are, however, found in a large-spotted leopard-skin from Uganda described by myself in the Zoological Society's *Proceedings* for 1907 (fig. 91). Another leopard apparently belonging to the large-spotted group is *F. p. ruwenzorii*, named in 1906 by Mr. L. Camerano in the *Bolletino* of the Zoological Museum of Turin, vol. xxi. No. 545. Since, however, the description is very brief, and there is no figure, it is impossible to be certain that the Ruwenzori leopard belongs to the large-spotted group.

All these large-spotted leopards have an interest from the geographical point of view. The fauna of northern Africa has, as mentioned earlier, a distinct affinity with that of Europe and western Asia. A leopard akin to the race inhabiting the Caucasus and Persia is therefore exactly the type that might be looked for in the northern districts of the Red Sea littoral, while if the Atlas leopard be of the same general type this would be also what we should expect. On the other hand, since East Africa was at one time connected with India *via* the Seychelles, it is here that we should naturally look for an approximation in the markings of the leopards to the Indian type.

With the exception of the foregoing northern and eastern races, all other African leopards appear to be of the small-spotted type, in which the rosettes are small and closely approximated, and in the region of the shoulders tend to break up more or less completely into irregularly distributed solid spots. Apparently only two of these have received distinct names, namely, the West African *F. pardus leopardus*, typically from Guinea, and the pigmy Somali race, *F. p. nanopardus*. The former, in common apparently with West African leopards generally, has the ground-colour of the under-parts in some instances yellowish, and that of the back olive-tawny. On the other hand, in the pigmy Somali leopard (which was described by Mr. O. Thomas in the *Annals and Magazine of Natural History* for 1904, ser. 7, vol. xiv. p. 94) the ground-colour is white below, passing gradually

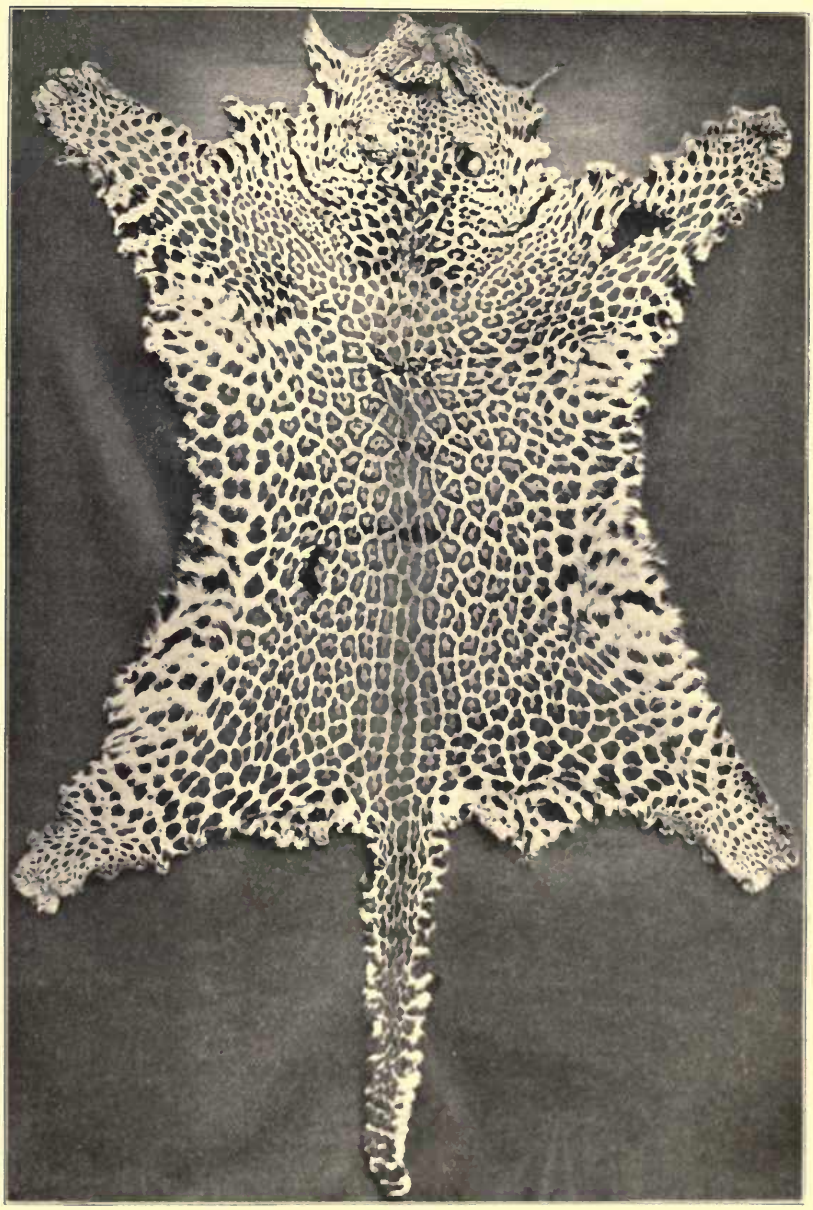


FIG. 91.—Skin of a Large-spotted African Leopard from Uganda.

into creamy buff above. The length of the flat skin of a male is less than six feet. Larger leopards from some parts of East Africa have the same type of colouring and marking as the pigmy Somali race. They probably indicate at least one distinct local subspecies.

Of the leopards of South Africa little or nothing appears to be known, except that Dr. A. Günther (*Proc. Zool. Soc.* for 1885 and 1886) described skins from the Grahamstown district in which the rosettes are completely broken up into small, widely separated spots, while the ground-colour of the back is deep tawny, with, in some cases, a distinct tendency to melanism; the under-parts being white and the tail marked like the back. As "ordinary leopards" are stated to occur in the same district the coloration of the specimens described would seem to be more or less abnormal, and analogous to that of the black leopards of south-western Asia. Nevertheless, if they indicate a distinct local race, the name *F. pardus melanosticta*, suggested by Dr. Günther, is available.

It should be added that even the large-spotted African leopards have the lines of the light network between the rosettes relatively narrow, whereas in Asiatic leopards they are wider.

The record length in African leopards appears to be 7 feet $10\frac{1}{2}$ inches (in an East African specimen), next to which comes a female from Matabililand with a length of 7 feet 9 inches; the measurements in both instances being taken previous to skinning. The maximum recorded weight (whether actual or estimated not stated) is 140 lb.

The following notes on the leopard in South Africa are condensed from an account supplied by Mr. F. Vaughan Kirby in 1899:—

"Leopards are distributed throughout the greater part of Africa wherever the country is suitable to their habits—rough hill-country intersected by deep *kloofs*, grassy plains, thin forest, or thickly matted jungle or river-banks; in all such places, if there is sufficient small game to provide them with food, leopards may be found. They are perhaps more strictly nocturnal in their habits than lions, seldom leaving their lairs before it is quite dark, and returning before dawn. Occasionally, however, they may be seen sunning themselves high up on a rocky *kopje* or on some mountain-spur. Their lairs are often made at a considerable distance from water; and as they do not seem to evince partiality for any particular surroundings, they turn up at times and in places where least expected. When disturbed, they creep away so stealthily that it is difficult to obtain a shot at them; and they are far more silent than lions. Occasionally they utter low moaning

FIG. 92.—Skin of a Small-spotted African Leopard.

grunts, but their ordinary cry, repeated three or four times in the same key, is extremely harsh. Although leopards, like lions, are quite content to eat carrion sometimes, they have undoubtedly a greater craving for warm blood. In hill-country bushbuck, duikers, monkeys, hyraxes, etc., form their principal prey, but in the low country larger animals are overpowered.

"Leopards cover great distances at night in search of prey; and when quartered near native villages exact a heavy toll of calves, goats, and dogs, while, when among a flock of sheep or goats, they will strike down their victims right and left, as if impelled by sheer love of slaughter. They display great cunning and boldness in abstracting dogs—to the flesh of which they are very partial—from a village or camp; but I have never met with a man-eating leopard in Africa. Their mode of attack is very similar to that of a lion. Either they lie in wait in the jungle on a river-bank and seize their victims as they come to drink, or fairly stalk them up-wind, advancing in the stealthiest manner, and noiselessly threading their way through the densest and most intricate jungle. The final rush is made with lightning-like rapidity and in silence, the throat being usually seized and the jugular veins severed, although the death-wounds are often given in the back of the head and neck. Sometimes the neck is broken; careful observation has, however, convinced me that this is not done—as by a lion—intentionally, but that the victim, standing on uneven ground when attacked, has rushed forward, and that the weight of the leopard on its neck has brought it down on its head and caused dislocation. A lion achieves the same result by dragging the head of its prey downwards, and seizing it by the nose with one paw. If two leopards attack, the neck and shoulders of the victim are seized; but I cannot recollect an instance of these animals seizing the flanks. After killing it, leopards drag their prey, if possible, to the nearest thicket, where opening it at the flank, they disembowel it as neatly as would a lion, and partially bury or cover over the entrails. Having eaten the heart and lungs, they attack, not the buttocks, but the breast-bone, eating all the meat, the softer bones, and the cartilage, the ears and nose being often bitten off, and the tongue torn out. Leopards seldom dismember large portions of a carcase, as will lions, in order to carry them off and devour them leisurely under a bush or tree, but set-to at the carcase and eat it where it lies. Should they suspect that it has been interfered with, they seldom return to the 'kill,' though they may drag it up a tree. Leopards are, indeed, most agile climbers, and the weights they often carry when so doing testify to their great strength; I have seen,

for instance, carcases weighing from 80 to 150 lb. dragged up and lodged in the fork of a branch 12 to 15 feet from the ground. When returning to a 'kill,' a leopard (unlike a lion) always examines the branches of the surrounding trees, and if at all suspicious makes a circle round the spot before advancing to the carcase; while if it has reason to suspect interference it will at once retire. Leopards never carry a carcase, but seize it by the neck and drag it exactly as does a lion. They take to water readily, and are expert swimmers. The cubs are born between October and December, usually two or three in a litter, although I have seen four on several occasions. Possibly some leopardesses may produce two litters in three years; and in any case it is evident that they are prolific animals.

"In my opinion scant justice has been done to the leopard as an object of sport. It is certainly of retiring habits, but the sportsman's perseverance and skill in forest-craft should overcome this obstacle; and when it comes to fighting there is no more savage, fearless, and determined animal in Africa, so that only the exercise of prompt judgment and cool, steady nerve will enable the sportsman to avoid an ugly mauling. There are several ways in which leopards may be hunted with more or less success; one being to attack them at a carcase at early dawn. Usually they leave their 'kill' at an earlier hour than lions, although this depends in some degree whether the country is much or little hunted. Watching from a platform by moonlight is another plan, but this entails the greatest caution and absolute silence, for their advance is so stealthy that the slightest movement will be detected. If a leopard approaches and suddenly sees the sportsman, believing itself unseen, it instantly retires as stealthily as it came; but if startled by a sudden movement, it bounds away with quick, hoarse grunts. If the bait be placed on the sand of a river-bed, and the platform built between it and the water, there is no risk of the leopard circling round, and its advance over the white sand will be clearly seen."

"In Somaliland," observes Colonel H. G. C. Swayne, "the leopard-skins are of exquisite softness of coat; the height of the Somali plateaus, often from 5000 to 6000 feet, accounting perhaps for their great beauty. The best of all, in which the spots are so large and so closely planted as to give the centre of the back almost a black appearance, are obtained from the highlands of Abyssinia, the main system from which spring the plateaus of Somaliland. These very handsome dark leopard-skins are used in thousands by the Abyssinian soldiers as cloaks. There is a very large animal inhabiting the hills which would

be described by sportsmen in India as a panther, and, allowing for native exaggeration, is probably the same size. Some very large Somali panther-skins may sometimes be seen exposed for sale in Aden. The animal usually met with by the sportsman is, however, the leopard,[1] which is distributed very widely, occurring everywhere except in the great treeless plains of short grass, where these animals probably do not exist. They are found in the open jungle fringing these plains, and in the level thorn-forests of the Haud; but are most numerous in the Golis and other ranges, or any rough hilly ground, where they are the terror of the shepherds, springing into kraals at night without fear, and causing nine-tenths of the losses among sheep and goats."

THE SERVAL

(*Felis serval*)

Tali, BECHUANA; *Tijger-kat*, CAPE DUTCH

The handsomest of the smaller African cats is the serval, a long-legged, spotted species, standing between 18 and 20 inches in height at the shoulder, and measuring approximately 40 inches in length to the root of the tail, while the tail itself is about 16 inches long. The ground-colour varies from bright yellowish buff or tawny to reddish orange, upon which are a number of large solid black or blackish-brown spots and streaks separated from one another by wide intervals. In the typical representative of the species, which is known to occur in South and East Africa, the spots are large and widely sundered, and on the hind-quarters are often nearly circular; farther forwards they gradually become elongated with a tendency to form longitudinal rows, and on the shoulders there are several distinct oblique stripes, while three or more longitudinal stripes traverse the middle of the back. There are two black bars on the inner surface of the upper part of the fore-leg, and the tail is ringed with black.

The serval ranges, in suitable situations, from the Cape to Algeria, and across the continent from west to east.

Considerable variation in the markings occurs even among specimens generally regarded as typical servals. In two South African examples shown in the British Museum (Natural History) the circular spots

[1] Naturalists do not recognise the distinction between panthers (large) and leopards (small).

extend much farther forward on the body than is the case in a skin from Uganda figured by Mr. R. I. Pocock on plate xxxviii of the Zoological Society's *Proceedings* for 1907. Usually the number of rows of spots or streaks, inclusive of the middle dorsal stripe (which may be double), is about fifteen.

On the other hand, in the West African race (*Felis serval senegalensis*), ranging from Senegambia to the Cameroons and Liberia, the number of rows of spots and stripes, as shown in the plate cited above, is certainly from seventeen to nineteen ; while the spots and streaks themselves are usually smaller, more numerous, and placed closer together.

In the Togo race (*F. s. togöensis*) the markings are stated to be

Fig. 93.—A Black Serval, shot by the Master of Belhaven in British East Africa.

still more numerous and closer, the total number of rows being given at from twenty to twenty-four, of which from five to seven on the middle line of the back form regular stripes.

A figure of the West African race will be found in vol. ii. p. 701 of Sir H. H. Johnston's *Liberia*.

Black servals appear to be by no means very uncommon. Many years ago Mr. F. C. Selous presented to the British Museum the skin of such a specimen from South Africa. And in the *Zoologischer Jahrbuch* for 1897, vol. xii. p. 569, Dr. Einar Lönnberg described a black serval from Angola, which he suggested might be known as *F. togöensis niger*. Again, in the *Fauna of South Africa*, Mammals, vol. i. p. 39, Mr. W. L. Sclater mentions a wholly black serval shot by Mr. H. C. V. Hunter in the Kilimanjaro district some time previous to 1900, and also refers to a very dark-coloured one killed at an earlier date in

the eastern Transvaal. In Mr. Hunter's specimen the black spots are stated to have been visible when the skin was held in certain lights. While writing this volume I received from the Master of Belhaven a photograph (herewith reproduced) of a black serval killed by himself in July 1907, some twenty miles W.N.W. of Mount Kenia, in British East Africa. The coat is described by the sender as absolutely coal-black, no mention being made of any appearance of spots.

The serval is a bush-haunting species, usually found not far from water, and preying chiefly on birds, rats, mice, hares, and occasionally the young of the smaller antelopes. Essentially nocturnal, it is not often encountered by sportsmen, and is usually taken by natives by means of snaring, or by hunting with dogs.

THE SMALL-SPOTTED SERVAL

(*Felis servalina*)

There has been some doubt as to whether this cat should be regarded as a species by itself or merely as a variety of the ordinary serval. On this point Mr. R. I. Pocock writes as follows on p. 663 of the *Proceedings* of the Zoological Society for 1907 :—

"In every particular but pattern, that is to say in general form, length, and slenderness of limb, length of tail, size of ears, and form of skull, it resembles *Felis serval.* Even in pattern the difference is rather one of degree than of kind. It is quite easy to imagine the transition from *F. serval* to *F. servalina* by the breaking-up of the cervical, scapular, and spinal [neck, shoulder, and back] stripes and of the larger spots on the body in *F. serval* into a countless multitude of small close-set spots showing obscure indication of serial arrangement usually only on the spinal and cervical areas. The difference might well be regarded merely as of subspecific importance, or perhaps as indicative of variation comparable to that of the speckled leopard-skins from Grahamstown [see p. 430].

"The available evidence seems, however, to me in favour of regarding *F. servalina* as a valid species. In the first place, there are, so far as I am aware, no skins showing a complete series of gradations between this form and the typical serval, which is opposed to the conclusion that the two are geographical races of the same species. In the second place, the distribution of *F. servalina* appears to accord very closely with that of many West African animals, like the

chimpanzi. . . . If in the future it be shown that the two live side by side in the same locality, the fact might be cited as evidence either of their specific distinctness or of their dimorphic [two-phased] nature."

Assuming the small-spotted serval to be a definite species, it may be divided into the following local races or subspecies. In the first, or typical, race, from Sierra Leone, the back is thickly and distinctly spotted, and usually shows a narrow dorsal stripe ; while the fore part of the shoulders, the sides, and the upper surface of the neck are practically uniform in colouring.

From the above the Uganda race (*F. s. pantasticta*) differs by the fore part of the shoulders being as thickly spotted as the back and the upper surface of the neck longitudinally streaked ; while another distinctive feature is the rich tawny yellow ground-colour of the flanks and thighs.

The third, or Monbutta, race (*F. s. poliotricha*) is distinguished from the preceding by the decidedly grey tint of the ground-colour of the thighs and flanks.

Finally, the British East African race (*F. s. liposticta*), as represented by a skin purchased at Mombasa, differs from all the other three in the absence of distinct spots or stripes on the back from behind the shoulders to the root of the tail.

THE AFRICAN TIGER-CAT

(*Felis celidogaster*)

This species, which has the build of an ordinary domesticated cat, although considerably superior to the latter in the matter of size, is of great interest on account of the fact that different colour-phases occur in the same individual. On one occasion a young gibbon ape kept in the Zoological Society's Gardens changed the colour of its coat from drab to black ; this change being apparently a permanent one, and not merely seasonal. An analogous change took place in an African tiger-cat living in the menagerie in 1907, the colour-change in this instance being from bright red to dusky grey. Unfortunately, the creature died soon after its metamorphosis, so that it could not be determined whether the change was seasonal, like the exchange of the red summer-dress of the roebuck for the olive garb of winter. It is, however, probable that the dusky coat would have been permanently retained. Such unexpected changes are very annoying,

in one sense, to the naturalist, who may readily regard the red and the black phases as representing two distinct animals. This, indeed, was the case with regard to the present species, of which the dusky phase was described by myself a few months previous to the metamorphosis of the Zoological Society's specimen as a new local race, under the name of *Felis celidogaster cottoni*.

The tiger-cat is an inhabitant of the equatorial forest-zone, where it ranges from the west coast to the Ituri in the east. It is, moreover, evidently a specialised form which is tending to lose its spots, these never being very strongly marked, and in some examples of both the red and the grey phases almost completely obsolete (except when the skin is viewed in certain lights). In the opinion of Mr. R. I. Pocock, as expressed on p. 660 of the *Proceedings* of the Zoological Society for 1907, it is not improbable that the species may be divisible into two races according to the degree of development of the spotting; each of these races exhibiting both the red and the grey colour-phase.

In the first, or typical, race, which is known to inhabit Sierra Leone, Liberia, Ashanti, Cape Coast Castle, and Accra, spots and stripes are developed on the crown of the head, the neck, and the middle region of the back, while the flanks are marked with a comparatively small number of larger and more distinct spots, and the tail is often distinctly ringed.

In the second, or more specialised, race (*F. c. aurata*), which ranges from the Cameroons and French Congoland eastwards to the Ituri, but has also been reported from Sierra Leone and perhaps Liberia, the spotting and striping on the upper surface is almost obsolete, although small, numerous, and closely set spots are retained on the flanks. The rings on the tail are never distinct, and may be wanting.

If both types occur in Liberia, there will be considerable doubt whether this cat (which has the alternative name of *F. aurata*) is really divisible into local races. Its habits are doubtless similar to those of forest-dwelling cats in general.

From the fact that dark phases of species of animals are invariably connected with abundant humidity, it is clear that this must also be the case with the dusky phase of the tiger-cat. It has, however, yet to be shown whether the change from red to dusky is a character common to the species generally, or whether it occurs only in certain parts of the forest district, and if so, whether it is restricted to certain individuals, and also whether it is permanently retained in these.

Very similar variations, in the matter of both colour and spotting, occur in the case of the Asiatic bay cat (*Felis temmincki*), the Chinese

representative of which has been described as a distinct species, under the name of *F. dominicanorum*, although it is really nothing more than a grey colour-phase.

Recent experiments on birds have demonstrated that exposure to a warm moist temperature, accompanied by absence of light, readily induces a darkening of the plumage; and it is accordingly evident that dark colour in wild animals dwelling under similar conditions is a very unstable feature.

THE AFRICAN WILD CAT

(*Felis ocreata*)

Phagi, BECHUANA; *Wilde kat*, CAPE DUTCH

Originally mentioned in Bruce's *Travels to discover the Source of the Nile* as the booted lynx, this cat has received an almost bewildering number of names, both popular and scientific; among which it will suffice to mention Kafir cat, Egyptian cat, *Felis caligata*, *F. maniculata*, and *F. lybica*. It appears to be closely related to the European wild cat (*F. catus*), and cannot possibly be confused with either the serval or the African tiger-cat, from which it differs in the markings taking the form (on a greyish ground) of more or less distinct transverse dark stripes; these stripes being most developed in kittens, and nearly obsolete on the back of many adult specimens.

In both the European and the African wild cat the sides of the body are typically marked with wavy transverse (vertical) dark stripes extending from the spine to the opposite surface, but better defined, as a rule, above than below. The upper portions of both limbs are marked with broad transverse bars nearly always darker than the body-stripes; the fore-leg has two conspicuous dark bars on the inner surface of its upper part, and the under surface from the toes to the wrist, as well as the back of the elbow, is black; while the hind-limb is usually black from the toes to the hock. The terminal portion of the tail has a black tip and usually three well-defined black rings, above which it is much less distinctly ringed, being generally marked with an ill-defined stripe on the upper surface. The throat is, at most, indistinctly striped, but usually has a white spot; the chest and fore part of the lower surface of the body are spotted, but the hind portion of the latter is, like the inner side of the thighs, uniformly coloured and tinged with yellowish buff.

Apart from the thicker and longer coat and the more bushy, and thus apparently shorter and blunter, tail of the northern animal, the two species are best distinguished, according to Mr. R. I. Pocock (*Proc. Zool. Soc.* 1907, p. 157), as follows:—

In the European wild cat the four paired stripes on the head and neck are well defined, and diverge on the back of the head from the middle line to run backwards almost to the shoulders as four wavy, widely separated stripes, of which the middle pair is generally better defined than the lateral pair, one of which occupies each side of the upper surface of the neck. In the African species, on the other hand, the stripes on the head and neck are usually ill defined, and if present on the neck narrow and close together. The European species generally has a distinct wavy black dorsal stripe, reaching from behind the shoulders to the root of the tail, and occasionally flanked by an indistinct and interrupted lateral stripe. In contrast to this is the darkness in the African wild cat of the whole spinal tract, upon which may be traces of three narrow stripes, but the middle one in such cases is always less strong than in the northern species.

Minor and less constant differences are noticeable in the colour of the ears, which is generally similar to that of the back in the European wild cat, although there may be a wash of yellow, either at the tips or all over. In the African wild cat, on the other hand, the ears are generally yellower or redder—sometimes very markedly so—than the back; although this feature does not occur in the Sardinian race. From the evidence of such specimens as have come under my own notice, I should say that the African wild cat is much less distinctly striped than the European species.

The range of this wild cat includes practically the whole of Africa, exclusive of the forest-zone and the Sahara, and likewise embraces Sardinia, while in former times it also comprised Gibraltar, where fossil remains from the rock-fissures have been assigned to this species.

Nor is this all, for in the *Proceedings* of the Royal Irish Academy (vol. xxvi. No. 1) Dr. R. F. Scharff has described the lower jaws of certain cats from caverns in Ireland and England, which he identified with the Egyptian wild cat. The species had, indeed, been identified as a member of the British Pleistocene fauna, and among the specimens referred to by Dr. Scharff are jaws from the caves of Happaway, the Vale of Eden, and Newhall, in Ireland. The lower carnassial tooth in these fossil cat-jaws is not only larger than the corresponding tooth of either domesticated or wild European cats, but also presents certain distinctive features of its own; but whether such differences are

sufficient to justify the reference of the fossil cat to the African species seems doubtful. The author goes, however, considerably further than this, and concludes that the wild cats, which he is convinced existed in the mountains of Ireland at no very distant date, also belonged to the African species. He even suggests that an Irish reputed wild cat from Donegal exhibited to the Zoological Society in 1855 by Mr. Tegetmeier may have been one of the last survivors of the genuine Irish wild cat. Further, he is of opinion that the majority of Irish domesticated cats are descended directly from the Egyptian wild cat without any of that intermixture of European wild-cat blood which apparently exists in their British representatives. If these conclusions are justified, we have to add another species of mammal to the Irish, and thus, in its larger sense, to the British fauna. But, in view of the fact that the African wild cat disappeared from every other part of Europe, with the exception of Sardinia and perhaps the Tuscan Maremma at a very remote date, naturalists will require stronger evidence before admitting its survival to our own times in the west of Ireland.

The typical race of the species is the Egyptian wild cat, while at the opposite end of the continent occurs the southern or Kafir race, *F. ocreata cafer*. Between these two extremes several local races have been identified and named; viz. *F. o. rubida* from Monbutta, *F. o. mellandi* from north-east Rhodesia, and *F. o. ugandæ* from Uganda. A description of these will be found in a paper by Mr. H. Schwann published in the *Annals and Magazine of Natural History* for 1904, ser. 7, vol. xiii. p. 421. The Sardinian race has been named *F. o. sarda*.

BURCHELL'S CAT

(*Felis nigripes*)

As the smallest representative of the Old World cats, this diminutive South African species can scarcely claim a place among game animals, although it is nevertheless inadvisable that it should be passed over without mention. According to the description given by Mr. R. I. Pocock on p. 669 of the Zoological Society's *Proceedings* for 1907, this species when alive, apart from colour and pattern, is remarkably like a diminutive domesticated cat, especially as regards the head and face. It has, however, proportionately shorter limbs,

and exceptionally small and delicate paws. The pupil of the eye, under the influence of strong light, forms a vertical slit in a yellow-green iris. From the characters of the skull it is evident that the species is near akin to the wild cats; and it may accordingly be a dwarfed and otherwise modified offshoot from the stock of the African representative of the latter. It may be described as a spotted rather than a striped species, with the general colour of the upper-parts creamy or greyish fawn, passing into grey like that of a rabbit on the face. The hair on the middle line of the back is lengthened into a diminutive crest, and the whole spinal area darker than the rest of the body, especially on the loins. The markings on the body take the form of large black or blackish-brown spots, which may assume a more or less linear arrangement in the neighbourhood of the spine, while there may be two or three oblique stripes on the chest. The tail has much the same markings as in the wild cat; and on the under surface the ground-colour is white or whitish with large black spots. The upper part of the fore-leg is marked by two broad black garters; and there are two similar bands above each hock, below which the under surface is black.

Burchell's cat has been recorded from Bechuanaland, the Kalahari Desert, Bamangwato, Deelfontein, and the Orange River Colony.

THE JUNGLE-CAT

(*Felis chaus*)

(PLATE XV, fig. 2)

Since both this and the next species of cat, together with the hunting-leopard, are common to Africa and India, the account of each given in the *Game Animals of India, etc.*, is here reproduced, with such alterations and omissions as are suitable to the present case.

The jungle-cat is a widely-spread species, ranging from north-eastern Africa and the Caucasus through Syria, Palestine, Transcaspia, Asia Minor, Persia, Baluchistan and Afghanistan, to India, Ceylon, Assam, Burma, and north-west China. In size it somewhat exceeds an ordinary domesticated cat; and it is easily distinguished by the almost or completely uniform tawny colour of the fur of the body, and the extreme shortness of the tail, which is less than a third of the total length. The ears are tipped with a few long black hairs, scarcely

sufficient to form a distinct pencil, although their presence serves to indicate the affinity of the jungle-cat to the lynxes, with which it agrees in the characters of the skull and teeth. Another special feature is in the more or less reddish colour of the backs of the ears. The length of the tail varies from one-third to two-fifths of that of the head and body. There are remarkable local variations in the size of the teeth and the colour of the fur.

The colour of the head and upper-parts of the body varies from sandy or yellowish grey to greyish brown, the back being darker than the flanks, often with a rufous, and more rarely a dusky tinge. Although the head and body are generally of a uniform colour, there are usually dusky bands across the limbs; and in some skins reddish stripes on the cheeks and a band of the same tint on the chest may be observed. More rarely indistinct vertical rows of spots or wavy lines occur. The under surface of the body is tawny or reddish white; the foot and ankle are brown beneath; the tail has a black tip, and several black rings in its terminal third; and the ears generally have black tips, and although often foxy red, may be more or less grizzled.

In 1898 Mr. W. E. de Winton, in the *Annals and Magazine of Natural History*, divided the species into several local races. As it was first described from specimens obtained in the neighbourhood of the Caspian, this region is the home of the typical race which extends into the Caucasus, Turkestan, and Persia, and may not improbably also occur in Baluchistan and Afghanistan. From this race the Indian jungle-cat (*Felis chaus affinis*) is distinguished by its slighter build, somewhat longer tail, and the bright foxy red of the back of the ears, which contrasts with the tawny of the rest of the head. The skull is proportionally narrower, and the teeth are relatively smaller, and less crowded together. On the other hand, the Egyptian jungle-cat (*F. c. nilotica*), which closely resembles the typical race in form and colour, although of rather superior size, is distinguished by the darker and more grizzled ears, the colour of which does not form a bold contrast to that of the rest of the head, as in the typical and Indian races, in both of which the ears are foxy red, although brighter in the latter than in the former. The range of this race includes Egypt, Nubia, and Abyssinia. To the other Asiatic races it is unnecessary to allude on the present occasion. In the *Sportsman in South Africa*, by Messrs. Nicolls and Eglinton, the jungle-cat is included among the fauna of southern Africa, but this is apparently erroneous.

THE CARACAL

(*Felis caracal*)

Rooi-kat, CAPE DUTCH

(PLATE XV, fig. 3)

The caracal, whose name is of Turkish origin, and signifies "black-eared," has a wider range in Africa than the jungle-cat, extending from Cape Colony to Nubia, Egypt, and Algeria, although its distribution in Asia is more restricted and does not include any of the countries lying east of the Bay of Bengal.

As stated in the *Game Animals of India, etc.*, from which the following account is mainly taken, the caracal forms a link between the jungle-cat and the true lynxes (which are unknown in Africa); its ears resembling those of the latter in being furnished with large tufts of long black hairs at their tips, although its tail is much longer, and the throat and chest lack the distinctive lynx-ruff. Still the caracal is more of a lynx than a cat, its skull and teeth being decidedly lynx-like. In size it is intermediate between the jungle-cat and an ordinary lynx; but it is of remarkably slight and slender build, the limbs being proportionately long, and the tail, which reaches down to the hocks, equal to about one-third the length of the head and body. The height at the shoulder varies from 16 to 18 inches, the length of the head and body from 26 to 30 inches, and that of the tail between 9 and 10 inches.

A caracal is an unmistakable animal, its lynx-like ears, uniformly red colour, and comparatively long tail rendering it unlike any other. With the exception of the outer surface of the ears, a pair of spots on the upper lip, and sometimes others on the face, as well as, in some instances, the tip of the tail, which are black, and two pairs of pale spots in the neighbourhood of the eyes, the whole of the upper-parts and limbs is uniformly reddish, varying from rufous fawn to brownish rufous. On the under-parts the colour varies from pale rufous to white, the inside of the ears being likewise white. Although it is rarely that traces of spotting can be detected on the back and sides of adult individuals, pale rufous spots are generally more or less in evidence on the light under surface of the body, and in newly born kittens the whole coat is distinctly spotted. Individuals inhabiting

desert districts are probably paler-coloured than those which live among grass and scrub.

The typical representative of the caracal appears to be the one inhabiting Transcaspia, Persia, Syria, Egypt, etc. The North African race, *F. c. berberorum*, was separated by Dr. P. Matschie on p. 144 of the *Sitzungs-Berichte Ges. Naturfor. Berlin* for 1892; it inhabits Algeria, Tunisia, and probably Morocco. The East African race, *F. c. nubica*, ranging from the Sudan to Senegambia and Cape Colony, was named so long ago as 1869 by Fitzinger. The northern race is a large, richly coloured animal, whereas the caracal from South Africa appears to be darker and greyer, with a somewhat shorter tail. Mr. Pocock suggests, however, in the Zoological Society's *Proceedings* for 1907, p. 675, that such differences may be dependent upon age, and that the living examples which have come under his notice do not justify the recognition of more than a single African race of the species.

Extreme agility and speed are two of the leading traits of the caracal, which is said to feed largely upon the smaller antelopes as well as upon birds. Although seldom seen in South Africa by the European sportsman, it is regularly hunted and snared by the Bechuanas for the sake of its beautiful fur; the skins being carefully matched and made up into karosses, or cloaks, which are worth, even up-country, as much as five guineas each.

THE HUNTING-LEOPARD

(*Cynælurus jubatus*)

Ihlosi, SWAZI; *Ingululi*, ZULU; *Leñau*, BECHUANA; *Luipard*, CAPE DUTCH

(PLATE XV, fig. 4)

From all the species—both cats and lynxes—included in the genus *Felis*, the hunting-leopard, or chita, to quote once more from the *Game Animals of India, etc.*, is distinguished by the circumstance that it is unable to withdraw its claws entirely within the margins of their protecting sheaths, so that the points remain exposed. The body is more slender, and the limbs are proportionately longer and slighter than in any of the species of cats; the animal being more specially adapted for racing than any of the latter. There are likewise

certain distinctive features connected with the skull and the upper flesh-teeth, which may be passed over without further mention.

In place of being called "hunting-leopard," the animal might have been better designated the "hunting-serval," since the black markings on its fur take the form of solid spots like those of the serval, instead of the rosettes distinctive of the leopard. In size and shape the species may be compared to a long-legged, slender-bodied leopard, with short and rounded ears, a tail somewhat exceeding half the length of the head and body, the hair of the neck rather elongated, so as to form an incipient mane, that on the under surface of the body rather longer and shaggier than elsewhere, and the fur as a whole somewhat coarse. On the upper-parts, as well as the outer surface of the limbs, the ground-colour varies from tawny to bright ruddy fawn, while on the under-parts it is paler, and devoid of the round black spots with which it is elsewhere ornamented; the chin and throat, which are buffish white, being also unspotted.

Towards the extremity of the tail the spots tend to coalesce so as to form incomplete rings. The outer surface of the ears is black, except at the base and on the margins, where it is tawny. From the outer angle of each eye a black streak runs to the lip, this being continued, either as a line or a row of spots, from the inner angle of the eye to a point just below the ear. The cubs have a coat of long and uniformly grey hair, but on turning this back more or less distinct traces of spots are noticeable on the shorter under-fur.

The geographical distribution of the hunting-leopard is very similar to that of the lion. Unknown in Ceylon and on the Malabar coast, the species ranges from the confines of Bengal to the Punjab, whence it extends through Baluchistan and probably parts of Afghanistan to Persia, Syria, and thence to Africa, where its range includes Cape Colony.

The usual height at the shoulder in African specimens is from about 29 to 31 inches, and the total length about 7 feet, of which some 31 inches are taken up by the tail. A fine African specimen in the British Museum stands, as mounted, 31 inches at the shoulder. The Indian race seems to be smaller.

The African representative of the species has been stated to have a more woolly under-fur than the typical Indian animal, and has hence been named *lanius*. According, however, to Mr. Vaughan Kirby, the length and woolliness of the coat are mainly dependent upon station; specimens from high ground having longer fur and more bushy tails than those inhabiting the lowlands. The same observer states that

he has never seen African hunting-leopards with a streak running from the upper angle of the eye to the base of the ear, as in some Indian examples.

As Dr. Sclater's name *lanius* is ante-dated by *guttatus*, the African race of the species should be known as *Cynælurus jubatus guttatus*.

The following notes on the hunting-leopard in South Africa are abbreviated, with some slight modifications, from an account written by Mr. Vaughan Kirby in 1899:—

"Chitas are by no means so rare in South Africa as many writers would have us believe, and I have encountered many at different times. They are numerous in the Transvaal, amongst the foot-hills of the Drakensberg, and in the low country, particularly between the Oliphants and Letaba rivers. They are not strictly nocturnal, for I have seen them hunting at all hours of the day; and on one occasion, when I had off-saddled in the low-country at mid-day, a pair tried to stalk my own horse and that of my after-rider, but we awoke in time to prevent them executing their plan. If they have killed, they will readily feast during the day. Their lairs are made amongst rocks or grass-jungle; and they usually hunt in couples, although I have seen parties of four, five, and six. They prey on antelopes, and, when near native villages, on calves, sheep, and goats; but I have never known them eat carrion. The largest antelope I have seen killed is a kudu: they fairly stalk their game, up-wind, coming in with a grand rush at the last, if the animal bolts. They invariably kill by strangulation, and though I have examined many such victims, I have never seen a double set of fang-wounds, showing that they seldom relax the first grip of the throat till the animal is dead. They disembowel their prey in a clumsy style, quite unlike that of lions and leopards; usually eating some of the meaty portions of the entrails, but never burying them. The heart and lungs are first eaten, and then the nose, tongue, and ears, the whole head being, in fact, more or less lacerated and eaten. For a limited distance, at any rate, the chita is, in my opinion, about the swiftest animal in the world; and many times, even when well mounted and over good ground, I have failed even to force them into their best pace. Once, as I was stalking sable antelope near the Oliphants river, 'boys' directed my attention to a kudu feeding on the far side of a creek, about 200 yards distant, when it suddenly started, glanced behind, and then, laying its horns back, dashed through the creek towards us, with two creatures, which I took to be wild dogs, in pursuit. These ran but slowly at first, though the kudu, knowing its danger, was flying

at top speed. The antelope looked to have about 70 yards' start, and when the chitas—for such the pursuers were—stretched themselves out, was about 120 yards ahead; but the former now moved like lightning, running low with long easy strides, which quickly put them on the right flank of their victim, who swerved to the opposite side, but next instant the foremost chita's fangs were in its throat, and the bull came headlong to the ground in a cloud of dust. I believe both these chitas to have been males, for I shot one, which proved to be of that sex, while the other, which I spared on account of the entertainment it afforded me, appeared, if anything, the larger of the two. There is little sport in shooting these beautiful creatures, which seldom show much fight, and have but little power of defence."

THE AFRICAN CIVET

(*Viverra civetta*)

The civet-cats and their relatives the genets, meercats, mungooses, etc., constitute the family *Viverridæ*, of which the majority are comparatively small animals. They are near allies of the cats, but have, for the most part, longer heads and bodies, shorter limbs, and a larger number of cheek-teeth, among which the carnassial teeth are usually of a less scissor-like type, the lower one having a grinding surface behind the blade. Scent-glands are frequently developed. With the exception of the Malagasy fossa (*Cryptoprocta*), the civet-cats, or civets, of the genus *Viverra* are the largest members of the family, and may be recognised by their digitigrade limbs, partially retractile claws, the long and loose fur, and the presence of a black gorget on the throat, and generally of a crest of long hairs down the back. The only African member of the genus is the present species; and although there are numerous other African representatives of the family, belonging to distinct genera, none of these can claim to rank as game worthy of the sportsman's notice. Indeed, the civet itself is only admitted on sufferance.

The species is a native of the tropical and subtropical districts of the continent; and in former days was, like its Asiatic relative, of some commercial importance and value, as a source of the perfume to which it gives (or from which it takes) its name. Measuring about 50 inches in total length, of which some 18 are taken up by the tail,

the civet has a grey ground-colour, marked with irregularly disposed blackish stripes and spots, and the aforesaid gorget on the throat; the tail, which is darker than the body, being ornamented with rings, becoming gradually fainter in tint towards the tip. In habits civets are almost wholly nocturnal, and spend most of their time lurking in covert, from which they issue forth to prey upon domesticated poultry, guinea-fowls, bustards, and other game-birds, as well as lizards, frogs, eggs, mice, rats, etc.; while they will also devour fruits, or even roots.

THE SPOTTED HYÆNA

(*Hyæna crocuta*)

Wolf OR *Tiger-Wolf*, CAPE DUTCH; *Impisi*, ZULU, SWAZI, AND MATONGA; *Phiri*, BECHUANA; *Kwiri*, BASUTO; *Fisi*, MANGANJA; *Kuzupa*, ALOMWI AND MARUA; *Waraba*, SOMALI.

(PLATE XV, fig. 5)

Although representing a family (*Hyænidæ*) by themselves, hyænas belong to the same group of Carnivora as cats and civets, from both of which they are readily distinguished by their ungainly external appearance, and the form and structure of the skull and teeth. All the feet are four-toed and digitigrade, with the stout claws incapable of retraction. The tail is of moderate length and bushy, and the fur coarse, shaggy, and more or less distinctly marked with either spots or stripes. A hyæna's skull is easily recognised by the enormous vertical crest of bone on the hind half of its upper surface, which affords adequate support for the powerful muscles of the jaws. The cheek-teeth in front of the carnassials are of stout, conical form, well adapted for bone-cracking; while the carnassials themselves are very similar to those of the cats, the upper one alone having a small molar behind it, or rather on its inner side, as in that family. All the three living species of hyæna are found in the African continent, to which two of them are restricted.

The spotted hyæna is the largest of the three living species, and is such a different-looking animal from the striped hyæna, which is the typical representative of the group, that it is sometimes referred to a genus by itself. Perhaps the most important characteristic of this species is to be found in the structure of the lower carnassial tooth, which consists solely of a two-lobed cutting blade, like the corre-

sponding tooth of a lion or a leopard, with no projecting heel from the hind end. Ugly and big-headed in appearance, and clumsy in build, with low, sloping hind-quarters, the spotted hyæna takes its name from the widely separated chocolate-brown solid spots over the ochery yellow coat. On the upper parts of the limbs the spots become smaller, while they disappear from the lower portions, which are uniformly dark brown. The ears, which are very sparsely haired, are rather large and rounded; and the tail is short. A male will measure about 5 feet 9 inches in total length, with a standing height of about 31 inches.

The range of the spotted hyæna extended in modern times from Egypt to Cape Colony, and westwards to Senegambia, the Congo, and the hinterland of the Cameroons and Togo districts. During the Pleistocene, or latest geological epoch, the species also ranged over Algeria, and a large part of Europe, occurring in the British Isles as far north as York and also in Ireland; this extinct race being known as *Hyæna crocuta spelæa*. The living representatives of the species present certain local variations in colouring and pattern, as well as in the length of the tail (exclusive of the terminal brush of hair), upon which Dr. P. Matschie, in the *Sitzungs-Berichte Ges. Naturfor. Berlin* for 1900, pp. 19 and 211, has founded a number of geographical races.

Of these, the typical race is believed to extend from Egypt through Central Africa to the Transvaal in the south, and Senegambia in the west. In Cape Colony this race is replaced by *H. c. capensis*; while the representative of the species inhabiting the Orange river district has been separated as *H. c. gariepensis*. All these appear to be relatively short-tailed races; but in *H. c. noltei* of the Cameroons, *H. c. weissmanni* of the Epukiro district of German West Africa, and *H. c. thierryi* of northern and *H. c. togöensis* of western Togo, the tail is proportionately longer. Of these, *noltei* is characterised by the tail being shorter than in the others and the spots on the hind region of the body for the most part greatly elongated, while even the normally round spots tend to become streaks. It will, however, be unnecessary to point out all the characteristics of this and the other races, and it will suffice to add that the East African representative of the species, inhabiting the Kilimanjaro district and elsewhere, has been separated as *H. c. germinans*.

For the following (condensed) account of the spotted hyæna in south-eastern Africa the writer is once more indebted to Mr. Vaughan Kirby:—

"These hyænas are distributed throughout the whole of the south-

east African 'low-country,' but were formerly common on the plateaus, at an elevation of 5000 feet. Nocturnal in their habits, they leave their lairs when the shades of evening close in, and retire at dawn. They seldom leave beaten tracks or footpaths, and will travel to and fro along the same line night after night. Their lairs are made in thorn-thickets, under steep banks or in deep grassy hollows, and sometimes in holes in rocks. Rarely they resort to burrows, but the female, when parturient, always retires to such a spot. Hyænas are gregarious, and troops of six or eight are common, while I have seen nineteen together. Personally I have never observed them seize and kill wild game, though natives say that they sometimes do so; but that they kill goats, donkeys, and even cattle, is certain. Usually, however, they confine their attention to wounded animals, or carcases which lions have secured; in the latter case, their greed often incurring summary punishment at the claws and teeth of the lions. It is no fable that hyænas watch vultures and thus find the carcases of animals, for I have seen them 'sloping' along, gazing skyward, intent only upon the direction of their fellow-scavengers' flight. On one occasion I shot a hyæna thus engaged, which proved to be one wounded a fortnight previously at my camp, half its lower jaw being blown away with a 10-bore charge of buck-shot; it was, however, fat and apparently thriving when killed. Spotted hyænas eat every portion of a carcase—skin, flesh, and bones; and leave little for a lion if they find a 'kill' in his absence. They can crack almost any bone with their powerful jaws; and what they cannot thus dispose of, they bolt with a wry face and a gulp. This is the reason lions kill so frequently; and their occasional failure to return to the carcase is probably due to their having been so frequently robbed by hyænas that they instinctively know how useless it is to revisit the spot. At night hyænas approach a carcase very cautiously, for they are terrible cowards, and stand looking at it and walking round it for half an hour before they venture to seize, perhaps, a 'length' of entrails, and rush off with it as far as possible, then work back on it, devouring it inch by inch, till eventually they become satisfied that no hidden danger threatens. When hungry—which must be often—they are very bold, and I have known native children carried off from the huts; while adults are sometimes seriously bitten, the cheek or the buttocks being usually seized and torn off. I have known these brutes to enter a camp and chew off the *riems* (by which oxen are fastened at night); but perhaps the most impudent act I ever witnessed was that of one which chewed the *riems* from a *stel* (set-gun), so that the weapon fell and exploded,

and the hyæna, when his scare was over, returned and ate the bait that was tied on the muzzle. Hyæna-pups are usually born in March and April, and I believe the number in a litter to be four."

The cries and sounds uttered by the spotted hyæna are all hideous and disconcerting; the most common being described as a weird "who-oop." Round a carcase these hideous brutes keep up a kind of laughing cackle; while when baffled, or otherwise disconcerted, they give vent to a snarling whine, and if trapped or wounded to a hoarse growl. They are said at times to attempt an imitation of the lion's roar, although no one has described the mimicry as successful. To the sportsman hyænas of all kinds are an unmitigated nuisance: they devour his baits—whether live or dead—set for nobler game, destroy his best trophies when put to dry, and generally make themselves obnoxious. Little wonder that they often receive a bullet out of sheer spite.

THE BROWN HYÆNA

(*Hyæna brunnea*)

Strand-Wolf, CAPE DUTCH

The second representative of the hyænas is the brown species, which formerly ranged from the extreme south of Cape Colony to Angola on the west and the Kilimanjaro district in the east; but in the more settled parts of the country has been so harried by shooting, poisoning, and trapping, that it has now become a comparatively rare animal. In some respects it is intermediate between the spotted and the striped species, although it differs from the former and resembles the latter in the presence of a distinct posterior projection or heel to the last lower tooth. Standing about 28 inches at the shoulder, the brown hyæna is characterised by the mantle of long brown hair draping the body, and the absence of a distinct mane or crest. Grizzled brown, faintly brindled on the flanks and buttock with broad transverse stripes of a darker brown, is the colour of the long body-hair; but there is a gorget of dirty yellow on the throat and sides of the neck. The tail, which is much more bushy than in the spotted species, is dark brown; and the limbs, on which the hair is short and stiff, are heavily barred with blackish brown or black.

The species derives its name of strand-wolf from its habit, in the days of its abundance, of frequenting the shores of Table Bay and

other parts of South Africa in search of the carcases of porpoises or whales or such other carrion as might be thrown up by the waves. In a work written for sportsmen there is nothing demanding special notice in the habits of this species, which are generally similar to those of its relatives.

THE STRIPED HYÆNA

(*Hyæna striata*)

Lidder, SOMALI

(PLATE XV, fig. 6)

The striped hyæna is readily distinguished from the brown species by the presence of an upright crest or mane of long hair on the neck and back, the shorter coat, and the distinct narrow transverse tawny

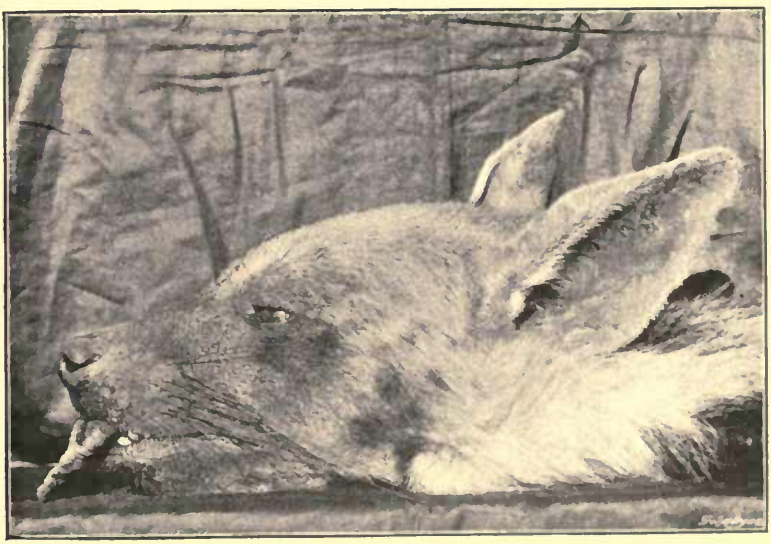


FIG. 94.—Head of a Striped Hyæna from North Somaliland, photographed by Lord Delamere.

or blackish striping, on a dirty grey ground-colour, of the whole body and limbs.

The striped hyæna is one of several species of Carnivora common to Africa and Asia; its range extending from India through Asia

Minor and Syria to northern and eastern Africa. In Somaliland, at any rate, the African representative of the species is longer-haired than its Indian relative. According to Dr. P. Matschie (*Sitzungs-Berichte Ges. Naturfor. Berlin*, 1900, p. 53), the African striped hyæna may be divided into three local races, namely, *Hyæna striata suilla* of southern Tunisia, *H. s. hienomelas* of Abyssinia and probably Somaliland, and *H. s. schillingsi* of Kilimanjaro and the neighbouring districts of East Africa. All are, however, very close to one another, so that it scarcely seems worth while to give their distinctive characters.

Unlike the spotted hyæna, the present species seems to be solitary in its habits, and it is rare that more than two are seen in company. It is also a less noisy animal, its cry being much less frequently heard than is that of the former; neither are the cries of the two identical, although there is a certain similarity between them, and both are equally hideous.

THE AARD-WOLF

(*Proteles cristatus*)

Aard-Wolf, OR *Maanhaar Jackal*, CAPE DUTCH

(PLATE XV, fig. 7)

A very brief notice must suffice for this animal, which may be compared to a small and rather thin striped hyæna, with proportionately longer ears, a more pointed muzzle, and remarkably weak teeth. It has also five, instead of four, front-toes; and it is chiefly owing to this feature and the peculiar characters of the teeth that the animal is assigned to a family (*Proteleidæ*) apart from the hyænas. Possibly it should be regarded as an abnormal member of the civet family (*Viverridæ*), which, perhaps for the purpose of escaping attack, has "mimicked" the striped hyæna. Standing from 18 to 20 inches at the shoulder, the aard-wolf (or burrowing wolf) has a long handsomely coloured coat, striped with dark transverse bands on a light ground, and an upright mane; the legs being similarly but more scantily barred, and the tail thick and busy. By the Bechuanas the skin is held in much estimation, especially as it lacks the disagreeable odour attaching to hyæna-pelts.

For a long time the aard-wolf was supposed to be confined to South Africa, but it is now known to range along the west side of the continent as far north as Angola, and on the opposite border into

Somaliland. By the Hon. Walter Rothschild (*Novitates Zoologicæ*, vol. ix. p. 443) the species was divided in 1902 into the following three local races, with the proviso that a fourth may occur in East Africa.

In the typical southern race the general colour is ashy grey, with the front and sides of the neck greyish white, and the mane on the hind part of the neck and back mingled grey and white, the latter predominating, and the tips of the hairs being brown. The black stripes are broad and well defined, while the tail is grey with a black tip and indistinct bands. In the Somali race (*Proteles cristatus septentrionalis*) the ground-colour of the coat is creamy white, with a slight wash of buff on the neck and sides of the rump, but with no trace of grey; while the stripes are less defined and on the neck broken up into spots, and the mane is black, somewhat variegated with creamy white. Finally, the Angola race (*P. c. harrisoni*) is broadly distinguished from the other two by the head being white grizzled with black, the ears whiter inside, and the general ground-colour pale orange-rufous, with the stripes much less developed; the mane being black somewhat variegated with rufous, and the tail also sable with a larger intermixture of rufous. The stripe running from the breast over the shoulders towards the back stops short about midway on each shoulder, while the three hindmost stripes of the other races are obsolete.

Aard-wolves pass much of their time underground, several inhabiting a single burrow in common. They feed mainly on white ants and carrion; further reference to the nature of their diet being made under the heading of jackals.

THE HUNTING-DOG

(*Lycaon pictus*)

Wilde-Hond, CAPE DUTCH; *Inkentshani*, ZULU; *'Budaja*, SWAZI; *Matshabidi*, BASUTO; *Letlhalèrwa*, BECHUANA

(PLATE XV, fig. 9)

Nearly all the members of the dog tribe, or *Canidæ*, are so easily recognised that a brief summary of characters will suffice on this occasion. They all have long, pointed muzzles, digitigrade feet furnished with non-retractile claws, four hind and usually five front toes, and moderately long, well-haired tails with a glandular patch on the upper surface near the root. The size of the pointed ears varies considerably in the different species. The teeth are of the general type of

those of the civets, but in the African members of the group are two more in number, the total being forty-two. The carnassials are of a much less decidedly scissor-like type than in either cats or hyænas, the lower one having a large tubercular portion behind the cutting blade. Details in the structure of the hind part of the skull distinguish the dogs widely from the members of the civet tribe.

The single representative of the genus *Lycaon* differs from domesticated dogs, wolves, and foxes in having only four toes on the front as well as on the hind feet, and also by its peculiar blotchy type of colouring, which recalls in some degree that of the spotted hyæna. Indeed, the whole appearance of the animal is more that of a hyæna than of an ordinary member of the dog-family. The nearest relatives of the hunting-dog, as the African species is generally called by naturalists, appear to be the dholes or wild dogs of Asia.

Large males will, it is stated, stand as much as 23 or 24 inches at the shoulder. The colour is a mixture of orange-tawny, black, and white, in various proportions. Sportsmen will often say that the African hunting-dog varies greatly in colour, just as do English fox-hounds and harriers ; but this is only half the truth, for it has been found from the study of a comparatively large series of skins in the British Museum that such colour-phases are in the main dependent on locality, and that, although there is a certain amount of individual variation in the members of a pack, yet for each locality the general type of colouring appears to be perfectly constant. In the year 1902 (in the *Annals and Magazine of Natural History*) Mr. O. Thomas pointed out the existence of three perfectly distinct local races or sub-species of hunting-dog, namely :—

The Cape race (*Lycaon pictus venaticus*), characterised by the prevalence of the orange-yellow over the black, the partially yellow backs of the ears, the large amount of yellow on the under-parts, and a certain number of whitish hairs on the throat-ruff. Next comes the typical *Lycaon pictus* from Mozambique, distinguished by the nearly equal development of the yellow and black, both above and below ; the backs of the ears and the throat-ruff being alike black, and the amount of white in the coat much less than in the Cape variety. The third, or East African race, for which Mr. Thomas has proposed the name *L. pictus lupinus*, is specially characterised by its extremely dark colouring, the yellow being reduced to a minimum. Two years later the same naturalist (*op. cit.* ser. 7, vol. xiv. p. 98) felt justified in naming the Somali representative of the species *L. pictus somalicus*. It is nearly allied to the dark East African race, but distinguished by its

smaller size, shorter coat, and less powerful teeth. The yellow in this race is of the buff tint characteristic of the Cape animal, and thus decidedly different from the richer and more orange hue found in the East African representative of the species. At the same time the Zulu hunting-dog was distinguished by Mr. Thomas as *L. p. zuluensis*. It is a small animal, profusely mottled on the back with white as well as yellow and black, of which the two last are in nearly equal proportions. The fur is long and coarse; the backs of the ears are blackish; the black streak on the back of the head stops short of the nape; the under-parts are tricoloured; the throat is black, without any white hairs; the limbs are mottled with black and pale buffish yellow; and the tail has a large white brush, occupying more than half its length. To the race from the Shari river district Messrs. Thomas and Wroughton (*Ann. Mag. Nat. Hist.* ser. 7, vol. xix. p. 375, 1907) have given the name *L. p. sharicus*.

From the foregoing it will be evident that the range of the hunting-dog extends from Somaliland to the Cape; on the western side, it may be added, the species apparently occurs as far north as Angola.

The following particulars with regard to the habits of hunting-dogs in South Africa are condensed from notes furnished by Mr. F. Vaughan Kirby:—

"These dogs are found throughout south-east Africa in suitable localities, but have been driven away from nearly all civilised, or partially civilised centres, except in Cape Colony, where the enormous tracts of scrub-bush offer a secure haven of refuge. In the Portuguese 'Provincia de Moçambique' I have not met with them, nor do I think they occur there; in fact, they are far less numerous throughout the regions north of the Zambesi than to the south of that river. They have three distinct cries: a short bark when they are suddenly encountered in the bush, or some strange object attracts their attention; a voluble chattering, frequently harshly guttural, made by a troop when excited, or after they have run down their prey; and a clear, single, musical call-note, often heard at sunrise when scattered members of a troop are calling to their comrades. Like other dogs, they are thirsty animals, and usually drink after sunrise, again at mid-day, and in the evening; and at mid-day, when the 'pack' has finished drinking, I have often seen them taking a sun-bath in the sand. Bold and inquisitive, when disturbed they trot away in front of an intruder, but frequently stand and bark at him; and I have heard of an instance of a man on the tramp who was pursued by a pack of these dogs and forced to take refuge at a sportsman's waggon, where the pursuit was

only stopped by firing. Under ordinary circumstances, however, they never venture to attack a human being. Although partly nocturnal in habits, they usually do their hunting in the evening or early morning, although I have heard them pursuing impala at midnight. The greatest enmity exists between domesticated dogs and these bush-pirates; the presence of the latter seeming to incite the former to frantic rage, although I have never seen a dog able to cope single-handed with these powerful-jawed creatures. Hunting-dogs are terribly destructive, not only to domesticated animals but also to game; far more so, indeed, than are either lions or leopards. More than once I have seen them sweep through a flock of goats, tearing and mangling its members in an incredibly short space of time.

"They hunt in packs, two or three, or sometimes only a single one, doing the running; these being relieved at intervals by others from the pack, and then at once falling back. I once witnessed these dogs pull down (though the words inaccurately describe what occurred) a big waterbuck, which raced out of the bush, and along an open river-bank towards my camp, whence I saw the chase capitally. When first sighted, three dogs were running in at intervals and snapping at the buck; the rest of the pack—eighteen or twenty—being fully 30 yards behind. Within 150 yards of the camp the buck turned suddenly into the tall reeds towards the river, closely followed by the dogs, when I ran along the bank in the hope of witnessing a final struggle in the water. To my surprise, however, about 200 yards beyond, the buck came back up the bank (the dogs evidently having headed it from the water) running very groggily, and lathered with sweat. There were now three dogs on each flank, snapping furiously at frequent intervals; and I could distinctly hear the clash of their jaws every now and then as they missed their spring. Suddenly the waterbuck stood, wheeled round, lowered his head as if to strike, and then fell exhausted amongst the fierce pack. Each barrel of my rifle accounted for a dog, and with some difficulty I drove the other brutes away, and then killed the waterbuck, which was fearfully mangled.

"On a second occasion I nearly witnessed a kudu being hunted to death in a similar manner; the dogs—twelve or fourteen in number—chasing the animal to within 100 yards of my position, two biting on one flank and three on the other. Unfortunately I was unable to get up in time to see the kudu actually fall, though I saw the dust of the scuffle, and therefore cannot say whether he was pulled down or fell from exhaustion. Waterbuck and kudu are, however, not fighters like the sable antelope; and the instance related by Mr. Selous of a

bull of the latter being tackled by a single hunting-dog is probably unique.

"I have taken pups from the breeding-burrows (which are never excavated, although frequently enlarged, by the dogs themselves) in March, at 4000 feet elevation, when they were a fortnight old, and in June, July, and September, at 1000 feet elevation, when from one to two months old. This would indicate that the period from March to May is the breeding-time, although I am of opinion that they have no regular season. I have twice seen a litter of four, once of six, and once of eight; but in the latter case the natives assured me that the hole was occupied by two bitches. The young may be partially tamed, but even then are always suspicious, and apt to snap. I have kept several, one of which was a keen and successful hunter, and always went foraging on his own account, although he would never consent to hunt with my other dogs."

JACKALS

(*Canis lupaster*, etc.)

Jackals come, perhaps, rather under the designation of vermin than game, and have therefore little claim to notice in this volume, although it may be advisable to devote a few lines to the African representatives of the group collectively. There are no true wolves in Africa; although for that matter it is by no means easy to draw a line between wolves and jackals, and the Egyptian jackal is not unfrequently termed the Egyptian wolf.

The largest representative of the whole group (which, by the way, is confined to the warmer regions of the Old World) is the aforesaid Egyptian jackal (*Canis lupaster*), which stands some 16 inches in shoulder-height, with a total length of about 50 inches. Stoutly built, with proportionately short ears, this species has the upper-parts yellowish grey mingled with black, which tends to collect in streaks and spots. The muzzle, the backs of the ears, and the outer surfaces of both pairs of limbs are reddish yellow; the margins of the mouth are white; and the terminal half of the tail is darker than the back, with a black tip.

The Morocco jackal (*C. anthus*), of north-west Africa generally, is a smaller, paler-coloured, sharper-nosed, and more lightly built animal than its Egyptian relative.

A third species is the variegated jackal (*C. variegatus*) of Abyssinia and Somaliland, which, although standing about 15 inches at the shoulder, and therefore but little inferior in stature to the Egyptian species, is (according to Mr. R. I. Pocock's description in the *Kennel Club Cyclopædia*) much smaller and lighter in build, its total length being only 40 inches. Compared with the Egyptian jackal, which is built more on the lines of a wolf, the Morocco species has a more greyhound-like character, its height being due to its great length of limb. The ears are somewhat larger than in the Egyptian jackal; and the general body-colour is pale stone-buff, with blotches of black.

As a companion to its small leopard, Somaliland possesses a pigmy jackal (*C. mengesi*), standing only a dozen inches in height, and characterised by its greyish-yellow body-colour, mingled with only a small proportion of black, the muzzle and legs being more decidedly yellow, and the under-parts white. The handsomest member of the whole group is undoubtedly the black-backed or silver-backed jackal (*C. mesomelas*), which is absolutely unmistakable, and has a range extending from Abyssinia to Cape Colony. It looks, in fact, almost as though it carried a black saddle-cloth; and the contrast between this sable, silver-spangled area and the bright rufous tan of the flanks and limbs is extremely striking and effective. All the blackness in this species is indeed concentrated in the back; the black on the fore-legs of other jackals being absent. The large ears, coupled with the sharp and slender muzzle, give to the black-backed jackal a somewhat fox-like physiognomy.

The last African representative of the group is the side-striped jackal (*C. adustus* or *C. lateralis*), so called from the presence on each flank of a white and a black stripe, the latter of which corresponds in position with the margin of the "saddle-cloth" of its black-backed cousin. Greyish drab mingled with black is the dominant colour, but there is a tendency to rufous on the face and limbs; while the rather long tail, unlike the preceding species, usually terminates in a black tip. The teeth and skull are relatively feeble; and the latter is somewhat flattened above, like that of a fox. The range of this jackal extends from the Gaboon in the west and Uganda in the east to Zululand in the south.

The following observations were contributed a few years ago by Mr. P. J. du Toit to the *South African Agricultural Gazette* in regard to the damage done to sheep-farming by the black-backed jackal, and the alleged harmfulness to the same industry of certain other small carnivora which seem likewise to come under the general designation of jackals

in Cape Colony and the Transvaal. It appears that for some years past large sums of money have been expended in the destruction of so-called jackals, without any discrimination being exercised in regard to which are harmful and which beneficial. For the majority of these animals are not carnivorous in a fashion which will harm the sheep-farmer, but prey on certain rodents and vermin which are highly injurious to the agricultural interest. According to the writer, in some of the north-western districts of Cape Colony the destruction of these small carnivora resulted some years ago in a plague of rats and mice, which did at least as much harm as was ever inflicted by sheep-killing jackals, and began to spoil the veld to an alarming extent by devouring the roots of bushes. Fortunately, a drought, which did much harm to flocks, did not spare the mice, and the "balance of power" was restored, so that farmers could start with a clean slate, if they would write off as a dead loss the money wasted in paying for the destruction of beneficial animals. The really mischievous species is the black-backed, or, as it is generally called at the Cape, the silver or red jackal. One farmer in the Graaf-Reinet district found, for instance, that after putting up a vermin-proof fence round his farm he raised 30 per cent more lambs; this jackal and the wild cat being the animals that had previously done most of the mischief. In the Colony as a whole the annual loss, direct and indirect, attributed to the black-backed jackal is set down at a million and a half. On the other hand, the aard-wolf (*Proteles cristatus*), commonly known as the maanhaar (maned) jackal, is undoubtedly a beneficial animal, generally feeding on white ants. In the midland districts of the Colony, where ant-hills are scarce, it is, however, credited with carnivorous habits, although, from its feeble dentition, it can scarcely do much harm to stock. The bakoor (basin-eared) jackal, or long-eared fox (*Otocyon megalotis*), is likewise stated to subsist almost exclusively on ants, while the draai, or t'gamma jackal, the cama fox (*Canis cama*) of naturalists, is asserted to live on mice, hares, and the young of the smaller game. The name draai (Dutch for "turn") is given to this pretty little species from the swiftness with which it "doubles." When moving, it is stated to carry the tail at right angles to its body in a horizontal plane, a fact which does not appear to be recorded in any work on natural history.

It may be incidentally mentioned that the long-eared fox, the sole living member of the genus *Otocyon*, is represented by an extinct species, *O. curvipalatus*, in the upper Tertiary deposits of north-western India.

THE CUBEROW

(*Canis simensis*)

Cuberow, ABYSSINIAN

(PLATE XV, fig. 8)

On account of its rarity and zoological interest a few lines may be devoted to the cuberow, or so-called Abyssinian wolf, of the highlands of central Abyssinia, which, although described by Rüppell so long ago as 1835, was scarcely known in England, except by its skull, till a few years ago, when skins were brought home by Major Powell-Cotton.

Although called a wolf by the older writers, the cuberow is regarded by Mr. Oscar Neumann (as quoted by the Hon. Walter Rothschild in the appendix to Powell-Cotton's *Sporting Trip to Abyssinia*) as an overgrown fox; its habits, gait, and actions generally being described as essentially those of a fox. The length and slenderness of the muzzle of the skull (in which the premolar teeth are small and widely sundered) is another fox-like character. More important is the fact that the skull is fox-like in having the upper surface of the projection behind the socket of the eye hollow instead of convex.

Mr. Pocock, in the work cited under the heading of jackals, refuses, however, to admit the foxy affinity of the cuberow, and places it between the wolves and the jackals, although remarking that it differs more from the former than does the Egyptian representative of the latter. It is certainly neither a wolf nor a jackal.

In size the cuberow is stated by Mr. Pocock not to exceed the Egyptian jackal; while its prevailing colour is given as light yellowish red speckled with black. The tail, which is black-tipped, is darker above than the back; the lower surface of its basal portion, together with the margins of the mouth, the chest, under-parts, and the inner surfaces of the limbs being white. The total length of the animal is about 50 inches, of which 10 are taken up by the tail.

Even in its native home, the mountains of Simien, the cuberow is a rare animal, although several examples were seen alive by Major Powell-Cotton during his adventurous expedition to that region.

THE BROWN BEAR

(*Ursus arctus*)

In the case of such a familiar animal as the brown bear, it will be unnecessary to give anything in the way of general description, more especially since the species is represented in Africa merely by a practically unknown race in the Atlas mountains of Morocco. Neither is there any necessity to indicate the points by which the bear family, or *Ursidæ* (of which the Atlas bear is the sole African representative), differs from the *Canidæ* or dog tribe.

The first rumours of the existence of a bear in the Atlas appear to have reached Europe in the earlier part of the nineteenth century during, or shortly after, the invasion of Algeria by the French. More definite information was afforded by an Indian official, Mr. Crowther, who in the year 1841 appears to have seen a female Atlas bear. According to his notes, the animal is somewhat inferior in size to an American black bear, but of rather stouter build, with a shorter and blunter face, and unusually short, although thick, claws. The muzzle is described as black, and the shaggy hair black or blackish brown above and orange rufous beneath. Mr. Crowther's specimen was seen at the foot of the Tetwan range, about five-and-twenty miles from the Atlas; and the animal was reported even at that date to be very rare. Mr. Edward Blyth in 1841 suggested the name of *Ursus crowtheri* for the Atlas bear; a name which—on the supposition that it is a race of the European brown bear—may be amended to *Ursus arctus crowtheri*. From that day to this, so far as I am aware, nothing has ever been heard of the Atlas bear.

In view of the apparent rarity of the animal, it is important to mention that fossilised remains of bears have been discovered in caverns in north-western Africa, as well as in the rock-fissures of Gibraltar. A small kind of bear seems also to have existed down to a very recent date in Corsica.

Any information with regard to the brown bear of the Atlas would be of great interest, since naturalists do not even know whether it is still existing; while the characteristics of the race have never been properly defined.

THE ANT-BEAR, OR AARD-VARK

(*Orycteropus afer*)

Aard-Vark, CAPE DUTCH ; *Saherar*, ABYSSINIAN

One of the most remarkable of all living warm-blooded quadrupeds is the exclusively African creature to which the Cape Dutch have given the name of aard-vark, meaning earth-hog. And although this strange animal has nothing to do with swine (any more than it has with bears), there is something to be said in favour of the Dutch designation ; for in the matter of bodily dimensions it is not far removed from a medium-sized pig, while its sparsely haired, half-naked skin is distinctly pig-like, as are its elongated and slender muzzle and face, small eyes, and long, pointed, upright ears. With these, however, the pig-like resemblances come to an end, for the short fore-legs terminate in four toes furnished with powerful curved claws for digging, while the hind feet are provided with five broad claw-like nails. The tail, too, is quite unlike that of a pig, being long, tapering, and of enormous thickness at the root. It passes, in fact, almost imperceptibly into the body, so that it is difficult to say exactly where the trunk ends and the tail begins. In this respect (to use the name commonly in vogue among English sportsmen) the ant-bear gives evidence of its relatively low grade in the zoological scale ; the imperceptible gradation of tail into trunk being a trait derived from reptilian ancestors.

The ant-bear is altogether peculiar in the matter of teeth, having none in the front of the jaws ; while the five or six pairs on the sides are of simple, subcylindrical form, although internally they are composed of a number of closely pressed vertical prisms, or columns, recalling in some degree the section of a palm-stem.

Till 1890 the ant-bear was supposed to have no deciduous or milk teeth. In that year the existence of small functional predecessors to the cheek, or molar, series of teeth was, however, discovered ; and recently Dr. R. Broom, in a letter to *Nature*, has announced the existence of a complete series of milk-teeth, a few of which may be functional for a short period. In other words, it is evident that the ancestors of the ant-bears were furnished with incisors, canines, premolars, and molars, all of which were alike preceded by deciduous teeth. More remarkable still is the fact that the number of cheek-

teeth (premolars and molars) was greater than in any other known existing mammal with teeth differentiated into distinct series, there being no less than ten pairs of these teeth. This, of course, has a most important bearing on the systematic position and ancestry of the animal, although at present it is not easy to come to any definite conclusion on these points. Usually it is placed, together with the Old World scaly ant-eaters, or pangolins, in the same order (Edentata) as the sloths and ant-eaters of tropical America ; but such an association is extremely doubtful, and it has been suggested that the ant-bear is an early side-branch of the stock which gave rise to the modern hoofed, or ungulate, mammals.

Be this as it may, the ant-bear is a creature altogether *sui generis*, which at the present day is the sole representative of the family *Orycteropodidæ*. The species has, however, been split up into a

FIG. 95.—Skin of Ant-Bear.

number of local races,[1] namely, the typical Cape ant-bear, from Cape Colony and Natal, the East African race (*Orycteropus afer wertheri*) from the hinterland of Bagamoyo, the Abyssinian race (*O. a. æthiopicus*) from Abyssinia and the Sudan, the Senegambian race (*O. a. senegalensis*), the Hausa race (*O. a. hausanus*) from the Togo hinterland, the south-western race (*O. a. albicaudus*) from German South-west Africa, the North Congo race (*O. a. erikssoni*), and the Cameroons race (*O. a. leptodon*).

In the first five of these the general colour is greyish and the tail long ; but the sixth is conspicuous on account of its brown colouring, and relatively short white tail.

In distinguishing these races Mr. Rothschild has made use of the number of the teeth, but this appears to be a feature of no importance ; the number of pairs in the upper jaw ranging from five to six and in the lower jaw from four to six, entirely independent of race. The colour

[1] See Rothschild, *Novitates Zoologicæ*, vol. xix. p. 506, 1907 ; Lönnberg, *Arkiv fur Zoologi*, vol. iii. No. 3, 1906 ; and Hirst, *Ann. Mag. Nat. Hist.* ser. 7, vol. xvii. p. 383, 1906.

is also somewhat difficult to determine in many skins, although it is probably an important race-character.

The typical Cape ant-bear is stated to have the hair pale sandy or straw-coloured on the body, but on the outer surfaces of the limbs, where it is longer and much more abundant, dark brown. The skull is of a rather long and narrow type, with a basal length of $8\frac{1}{2}$ inches.

The Abyssinian race is described as having pale yellowish hair, becoming dusky on the back in males, while on the loins and root of the tail a few longer black bristles are mingled; the hair on the upper surface of the head is short and pale-coloured; but that on the feet is long, profuse, and black. The skull is shorter and wider than in the Cape race, with the tear-duct pierced on the lower border of the lachrymal, at its junction with the cheek-bone, or jugal, instead of in the middle of the former. The basal length of a skull in the British Museum is $8\frac{1}{4}$ inches. The Somali ant-bear seems to be a rather smaller but closely allied race; the basal diameter of a skull in the British Museum (No. 91. 12. 19. 9) being $7\frac{5}{8}$ inches. The name *O. a. somalicus* may be suggested for this race.

According to an old description, the general colour of the hair in the Gambian race (*senegalensis*) is bright tawny or yellow, becoming more golden on the rump; while on the limbs it becomes bright rufous fawn. The skull is of about the same length as that of the Abyssinian race, but much broader and more depressed, with the tear-duct piercing the lachrymal bone more on its lateral surface, instead of at the hind angle.

The Hausa race (*hausanus*) is stated to be between cinnamon-brown and bright brown in general colour, with a wash of red, especially along the middle line of the back, while the limbs are dark brown.

In the Bagamoyo race (*wertheri*), on the other hand, the colour is stated to be iron-grey, with a faint reddish tinge in certain lights, and the limbs blackish brown. I know nothing of the skulls of this and the preceding race.

The Congo race (*eriksson*i) is sufficiently distinguished by its large skull, of which the basal length is 10 inches. The general colour is light sandy brown, becoming yellowish white on the rump and tail, with dark feet, and a broad dark belt over the shoulders, as well as a dark area on the head.

The Cameroons ant-bear (*leptodon*) has a skull almost as long as that of *eriksson*i, but with much smaller and narrower teeth—narrower

than in any other race. The fore part of the skull is also much expanded laterally.

The most distinctive characteristic of the Damara race (*albicaudus*) is the whiteness of the relatively short tail; the general colour of the body being deep brown, while the head is greyish brown with a tinge of red.

Lastly, we have an ant-bear from north-east Rhodesia in which the basal length of the skull is the same as in the Cape race ($8\frac{1}{2}$ inches). There appear, however, to be slight differences in the details of the skull-structure, while the general colour of the hair on the body is wood-brown, passing into black on the feet. The race may be named *O. a. wardi* in honour of Mr. Rowland Ward, who presented the type skull to the British Museum.

Ant-bears are burrowing animals, with long extensile tongues, and feed exclusively on white ants and ordinary ants. The following notes on these animals in Abyssinia are given in Major Powell-Cotton's well-known book on that country :—

"The rains having commenced, it was easy to track them. They do not seem to feed much at any one ant-hill; one we followed had visited several in a night, tearing off a large piece half-way up and then moving on. They seem to prefer a sort of ant that lives in the ground but throws up no hill, for we found numerous trenches where this one had found and followed up an ant-tunnel. They will also dig into old, deserted ant-hills, re-excavate and lengthen an old burrow, or drive a hole into a bank, and in each case after a good deal of labour work out again and move on.

"For their home-burrow they generally drive a sloping tunnel till they reach a depth of four or five feet, and then dig along through the soft earth or sand below the stratum to which the rains penetrate. In this they can burrow far quicker than any number of well-equipped men can follow them, who have to dig through the hard-baked layer of soil under which the animals drive. A large number of men might cut a circle round, but it would be a difficult and tedious task. I tried digging one out, but as soon as we sank a cross trench ahead of the beast, it turned off to one side.

"Eventually, one evening I lay out near a hole one had entered the night before. I missed it the first time it showed. Two others came close to us during the night. They move very close to the ground, until alarmed, when they raise themselves like a lizard. One appeared to spring backwards four or five yards, and then stopped, with its head raised towards us. The beast in the burrow showed

again, and I wounded it. Next morning I found it had gone down a burrow, in which it was able to move the old soft earth, but could not dig into the hard earth at the end.

"The shape of the burrow was an irregular oval, the longer diameter being 10 feet 7 inches and the shorter 7 feet 3 inches; the end where we found the animal was 5 feet 5 inches below the surface, and almost under the entrance. None of the Abyssinians with me had seen a 'saherar' before, and it excited much interest on the road to Asmara."

HARES AND RABBITS

(Genus *Lepus*)

Since hares and rabbits are mentioned in *Game Animals of India, etc.*, the companion volume to the present work, a few lines must be devoted to the African species, of which the following is a list (exclusive of local races):—*Lepus atlanticus* and *L. maroccanus*, Morocco; *L. harterti*, Sahara; *L. whitakeri*, Tripoli; *L. cabylicus* and *L. pallidior*, Algeria; *L. lumetæ*, Tunisia; *L. chadensis*, Lake Tchad district; *L. fagani*, Lake Tsana district; *L. ægyptius*, *L. rothschildi*, and *L. innesi*, Egypt; *L. sherif*, Mogador; *L. isabellinus*, Sennar and Kordofan; *L. habessinicus*, interior of Abyssinia; *L. berberanus*, Abyssinian and Somali coast-country; *L. somaliensis*, interior of Somaliland; *L. tigrensis*, Abyssinian highlands; *L. hauheri*, Upper Nile; *L. microtis*, Bahr-el-Ghazal and northern Abyssinia; *L. crawshayi*, Brit. E. Africa; *L. ochropus*, Zambesia; *L. whytei*, Nyasaland; *L. victoriæ*, Victoria Nyanza district; *L. ruddi*, Siludeni and Transvaal; *L. crassicaudatus*, Cape Colony; *L. capensis*, South Africa and Mozambique; *L. melanurus*, Natal; *L. saxatilis*, highlands of Cape Colony, Natal, etc.; *L. monticularis*, Deelfontein; *L. angolensis*, *L. ansorgei*, and *L. salæ*, Angola.

To describe these in detail would occupy too much space, and a few notes on some of the chief types must accordingly suffice.

The Egyptian hare (*L. ægyptius*), the species depicted in ancient frescoes and sculptures, is smaller than the English hare, but has much longer ears and paler-coloured fur. *L. somaliensis* and *L. tigrensis* are nearly related. Another well-known species is the Cape rock-hare (*L. saxatilis*), which is nearly as large as the English species, but has longer ears and limbs, with the fur rufous above and dirty white below.

The South African hare (*L. capensis*) and the closely allied *L. ochropus* differ by their shorter limbs, the absence of a rufous tinge on the back of the neck, and the yellowish throat. When hunted, they carry their ears erect. With the exception of the two under-mentioned species, all the African hares belong to the typical group of the genus *Lepus*.

Very distinct are the South African red-rumped hares (*L. crassicaudatus* and *L. ruddi*), which are small rabbit-like species with the rump and tail bright rufous, and the tail itself unusually thick. By some writers these two species are classed in the same subgenus (*Oryctolagus*) as the rabbit; while by others they are referred to a group apart, as *Pronolagus*.

None of the South African hares afford good sport, having but little speed, and generally going to ground; while some, at least, are foul-feeders.

The so-called jumping-hare (*Pedetes caffer*) has nothing whatever to do with the true hares and rabbits, but represents a family by itself.

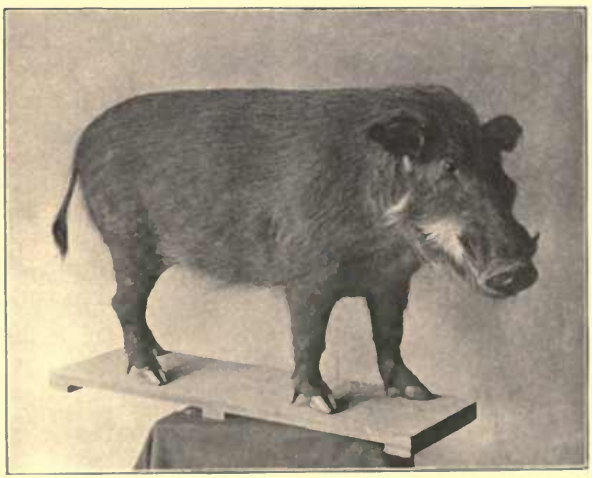


FIG. 96.—A Female West African Forest-Hog.

FIG. 97.—The Record Head of the Western Race of Buffon's Kob, killed by Lady Constance Stewart Richardson in Nigeria.

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THE END

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