

THE MAMMALS OF SOUTH WEST AFRICA

A BIOLOGICAL ACCOUNT
OF THE FORMS OCCURRING IN THAT REGION

BY

CAPTAIN G. C. SHORTRIDGE, M.B.E., C.M.Z.S.

*Director, Kaffrarian Museum,
King William's Town, South Africa*

With a Foreword by

FIELD-MARSHAL VISCOUNT ALLENBY, G.C.B., G.C.M.G.

WITH ILLUSTRATIONS AND MAPS

VOLUME I

*Published by the assistance of a grant made by the Research Grant
Board of the Union of South Africa from funds provided by the
Carnegie Corporation of New York, United States of America*

vol. I pp. i-xx v. 1-437

vol. II pp. i-ix, 437-779



LONDON: WILLIAM HEINEMANN LTD

1934

Family RHINOCEROTIDAE

The Black Rhinoceros

Diceros

Diceros Gray, 1821, London Med. Repos., vol. XV, p. 306; genotype *D. bicornis* Linnæus 1766, Syst. Nat., 12th ed., I, p. 104. The Black Rhinoceros from the Cape.

Black Rhinoceros—Swartrenoster

Diceros bicornis Linnæus

(1) DICEROS BICORNIS BICORNIS.

Rhinoceros unicornis var. *bicornis* Linnæus, 1766, Syst. Nat., 12th ed., I, p. 104.
Type (not in existence) from "The Cape."

(2) DICEROS BICORNIS OCCIDENTALIS.¹

Opsiceros occidentalis Zukowsky, 1922, Arch. Naturg., Abt. A, Heft 7, pp. 162-163; id., ibid., 1924, Heft I, pp. 80-82.

Type (in the Berlin Museum?) from the Kaokoveld.

NATIVE NAMES:

PERSONALLY COLLECTED

Herero: *Ongáva*.

Ovambo: *Ongáva*, *Ompánda*.

Ovadirico, Ovacuangari: *Simpánda*.

Mambakushu: *Fumě*.

Bechuana: *Tshukúdu*.²

Barotsi: *Sukúlu*,² *Sambélě*.

!Kung Bushman: */Khi*.

Berg Damara, Nama Hottentot, Hei||kum, Naron, & ||K'au||en Bushmen:
/Ki:s.

OTHER SOURCES

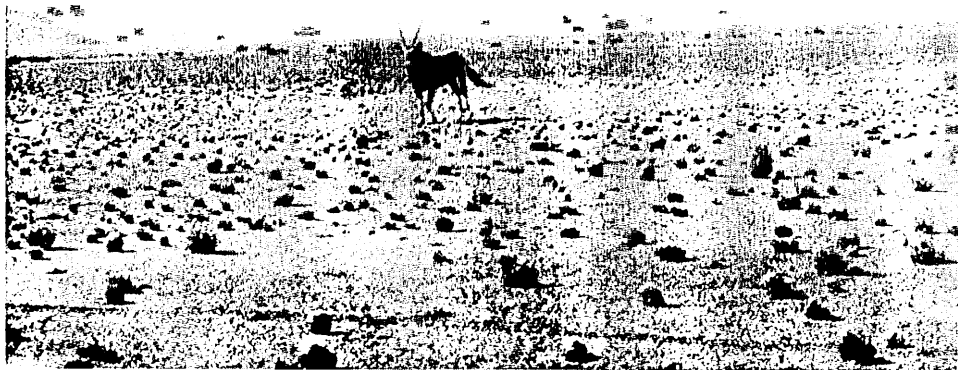
Mambakushu (Simbukushu): *Fumu*, *Chukúdu*³ (Balme); *Kafuru*³ (Zukowsky).

Bechuana: *Borele* or *Keitloa* (Smith, Selous, Kirby); *Tschukurru*³ (Zukowsky).

¹ Even if distinguishable from typical *bicornis*, *D. b. occidentalis* is presumably a synonym of *Rhinoceros niger* Schinz, 1845, Syn. Mamm., p. 335; from Chuntop, near Mt. Mitchell, Kuiseb District. Type not in existence.

² Selous recorded *Chukuru* (Bechuana) for the White Rhinoceros, so that all similar sounding names may originally have referred to that species during its existence in Bechuanaland and South-West Africa; now that the White Rhinoceros has been exterminated, all names formerly distinguishing seem to be used indiscriminately for the Black Rhinoceros.

³ Possibly old names for the White Rhinoceros; now in use for the Black Species.



Gemsbok (*Oryx gazella*). Great Namaqualand.
With acknowledgments to an unknown photographer.



Immature Black Rhinoceros (*Diceros bicornis occidentalis*). Kaokoveld.
With acknowledgments to an unknown photographer.

Sikololo:¹ *Sukulu* (Lancaster and Balme).
 Ngamiland Natives: *Chukudu*¹ (Neale).
 Makuba: *Kafuru*¹ (Zukowsky).
 Barotsi: *Pemberi* (Ward).
 Zambesi Natives: *Chipambiri* (Lydekker).
 Tonga: *Chipembere* (Lancaster).
 Chinkoya: *Shalangwa* (Lancaster).
 Chila: *Shempela* (Lancaster); *Shempola* (Ward).
 Chilavale, Kaonde: *Chilangwa* (Lancaster).
 !Kung Bushman: *Ke* (Zukowsky).
 Sikwengo (Hukwe) Bushman: *K'le* (Balme); *Ke* (Zukowsky).
 ||K'au||en Bushman: */Xi:* (Bleek).
 Masarwa (Kakia) Bushman: *Dju.*¹ (Bleek).
 /Kam-kalke Bushman: ||*Xoa:ken* (Bleek).
 !O!kung Bushman (Central Angola): ||*Xei* (Bleek).

DISTRIBUTION IN SOUTH-WEST AFRICA.—The Kaokoveld: Between the lower Ugab River and the Cunene there may be still between 40 and 80 rhinoceros.

In 1923 Manning estimated that, at most, there were 50 in the entire territory. They are apparently distributed from about the latitude of Kaoko-Otavi northwards; although, during and after the rains, while surface water remains in pans and vleis, a few pair wander regularly as far south as the northern and north-western parts of Outjo District. I observed old rhino tracks in dry mud within about eight miles of the Outjo-Kaokoveld Border (near Kamanjab): farther west rhino are said to occur around Zesfontein. They do not, however, habitually trek over such wide areas as elephant.

“Sporadically distributed in the Southern Kaokoveld: rhino ‘islands’ occur as far south as the lower Ugab River. Rhinoceros become more numerous towards the Cunene Valley, and there would appear to be about one rhino to every 12 km. along the south bank of that river, across which (in S.W. Angola) they become more plentiful.”—Steinhardt.

I observed more or less recent indications of rhino around most of the water-holes visited in the Kaokoveld.

Steinhardt records Rhino from the lower Huab, Koichab, and middle Hoarusib Rivers; between Okauera and Kaoko-Otavi; and around Otjitundua, Otjikuare, Oruvandji, Great Ombathu, and the Omuhonga Mountains.

Ovamboland.—Known as an occasional visitor in the extreme west. Also reported to occur very rarely in the north-east. Apparently unknown in the Namutoni Game Reserve. I heard no account of Rhinoceros having recently crossed the Okavango into Grootfontein District.

The Central Caprivi.—“Between the Okavango and the Chobe a few Rhinoceros are to be found, but they are scarce. Those I have seen—or observed the spoor of—were probably strays from the Lujana River within Portuguese Territory. In the Eastern Caprivi rhino are, I think, not found.”—Balme (1930).

¹ Possibly old names for the White Rhinoceros; now in use for the Black Species.

"They occur in the little-known parts of the Hukweveld, mostly near the Kwando."—Wilhelm.

"Rhino may be met with in the Caprivi and on islands of the Okavango."—Neale.

"Between the Chobe and the Zambesi, in the Eastern Caprivi, there are no rhino, and, according to natives, there were never any there even when the Makololo first came into the country; but directly the Zambesi has been crossed they are again found. In 1879 there were still two or three drinking in the Chobe to the north-west of the Sunta Inlet, west of longitude 24."—Selous.

Selous shot a Black Rhinoceros near the south bank of the Chobe in 1874.

Angola.—Rhinoceros are said to occur only in the southern half of Angola in the south-west and south-east.

"The Rhinoceros is comparatively plentiful in S.W. Angola, where its distribution is less sporadic than in the Kaokoveld."—Steinhardt.

"Reported to occur in the thorny bush along the Cuando (Kwando) and its tributaries, and also along the upper course of the Cubango (Okavango)."—Statham.

"Plentiful on the Lujana River, a western tributary of the Kwando, about 60 miles north of the Caprivi Strip."—Balme.

"Found on the Lujana in dense thornbush at a place known as Tschbombo where it is estimated that between 30 and 40 rhino exist. Also occurring in small numbers along the lower Kwito."—Wilhelm.

GENERAL DISTRIBUTION OUTSIDE SOUTH-WEST AFRICA.—"In Zululand there are probably not more than 100 Black Rhinoceros, all told; these are mostly in the Hluhluwe and Mkusi Reserves."—Warren (1930).

"A few Black Rhino still (used to?) exist in the North-Eastern Transvaal, in the dense bush which extends on both sides of the Portuguese Border between the Singwitsi River and the Limpopo, and also in the Sabi Bush on the south bank of the river. The presence of a considerable number of rhinoceroses at no great distance in Portuguese Territory, however, encourages the hope that recruiting (within the Kruger Game Reserve) may be possible, if, indeed, it has not already taken place. In Southern Rhodesia, where they were once so widely spread, they are now confined to a few districts; but a good many still exist in the Zambesi Company's Territories north of Beira."—S. Hamilton (1912).

"During 1893-94, I found rhino plentiful in Portuguese Zambesia to the south-east of Tete. In the rough broken country south of the Zambesi (east of the Victoria Falls); in parts of the Barue Country, and Chiringoma (P.E.A.), they are still fairly numerous; and there are a few in Matabeleland, Mashonaland, and Amatongaland."—V. Kirby.

"In Southern Rhodesia Black Rhino are still pretty common in the fly belts and along the western border."—Fleming (1930).

In Ngamiland, scattered in the swamps of the lower Okavango, there are a number of tree-covered islands which are never entirely submerged by floods: on several of the larger of these rhino occur.

"They are only found on the eastern side of the lower Okavango."—Wilhelm.

"In 1896 I found Black Rhinoceros plentiful in the interior of Mozambique."—V. Kirby.

"They are not so plentiful in Nyasaland as in N.E. Rhodesia."—Lyell.

In Northern Rhodesia Black Rhinoceros appear to be mainly restricted to the south and east.

The Zambesi-Okavango-Cunene regions are the only part of Africa where the Black Rhinoceros was ever known to be distributed across the continent. It then extends in a north-easterly direction, through Tanganyika Territory and the Eastern Congo (Katanga and some of the Mandated Territories), Kenya Colony, Northern Uganda (east of the White Nile), the Sudan (to upper Egypt, Kassala and Senaar), Abyssinia (the Dinder Valley, Hagog, etc.), and Western Somaliland.

It also occurs west of Lake Chad in French Equatorial Africa and Northern Nigeria.¹

"The Black Rhino has an extensive range in Africa from the Cape Region northward to upper Egypt, and from the East Coast westward to Nigeria. It is lacking throughout the whole of the Congo Basin, from Uganda proper, and also locally throughout much of the range as here defined. In the upper Nile Region it is found only on the east bank."—Roosevelt and Heller.

"In East Africa the Rhinoceros has suffered severely of recent years, and great numbers have been killed. The greater proportion inhabited the open plains and were thus conspicuous. Many were killed during the War in the southern parts of the Game Reserve by the troops of both forces."—Hobley.

HISTORICAL.—Black Rhinoceros extended, within comparatively recent times, at least as far south as Great Namaqualand, and they are still remembered by Bushmen and other native tribes.

There is a good Bushman engraving of a Rhinoceros in a cave near Berseba.

Schwabe (Mit Schwert in Deutsch-Südwest-Afrika, 1904) saw rhino skulls together with those of buffalo in the sand of the Swakop River at Nonidas.

Andersson (1850-54) shot nine rhinoceros in one day at no great distance from Walvis Bay.

Their extermination in the eastern districts, from Gobabis northwards along the Bechuanaland Border to the Western Caprivi, was doubtless more recent.

"Extinct for the last 50 years in the Omaheke and the Kaukaveld. Also extinct in the Kungveld, formerly found along the Omurambas Omatako and Omambonde: Rhino survived around Karakuwisa until about 1880."—Wilhelm.

OUTSIDE SOUTH-WEST AFRICA.—"The Black Rhinoceros became known at the time of the first settlement at the Cape in 1653 when it was common on the slopes of Table Mountain and in the Cape Flats, its range having been formerly wide-spread throughout the whole of South Africa."—Sclater.

The Albany Museum possesses teeth and other rhino remains from Committees, Tharfield, and Saltvlei (Albany and Uitenhage Divs.).

¹ Johnston records Black Rhino from Liberia (with a query).

There is a rhinoceros molar in the Kaffrarian Museum from an unrecorded locality in Kaffraria.

"In the bush of the Eastern Transvaal the old bones and skulls of rhinos are even now often seen, showing how very numerous this animal must once have been in the locality."—Stevenson-Hamilton.

"The extinct forms of rhinoceros are very numerous, many different genera being represented throughout North America, Eurasia, and Africa; but so numerous have been the lines of divergence that it is quite impossible to trace back through the maze of forms any of the modern genera. The Black Rhinoceros has been reported by Scott from the Pliocene of Natal, and two other fossil species are described by Pomel in the Pleistocene of Algeria. The living species are confined to Southern Asia, Sumatra, Java and Borneo, and Africa south of the Sahara Desert. Until very recently Siberia and Northern Europe were the habitat of the Woolly Rhinoceros (*Cælodonta antiquitatis*), which was contemporaneous with man. *Diceros* is to-day represented by a single species, *bicornis*, and is confined to Ethiopian Africa."—Roosevelt and Heller.

Historical chronicle of the recent extermination of the Black Rhinoceros throughout the greater part of Southern Africa:

1653, Van Riebeck's Diary—"Common on the Cape Flats and the slopes of Table Mountain".

1655, *Cape Times*, 5th January, 1933 (South African History)—account of a rhinoceros killed near Salt River, Cape Flats.

1685, Theal—Account of a rhino upsetting Simon van der Stel's coach near Piquetberg.

1685, Tachard—Occurrence at the Cape.

1719, Kolbe—Still existing at the Cape.

1775, Sparrman—Record from Quammedacka (Commadagga), Somerset East.

(c) 1790, Gordon—The Gamka River, Oudtshorn.

1801, Barrow—The Fish River (note on map).

1803-04, Lichtenstein—Calvinia and the Little Fish River.

1822, Pringle—The Eastern Province.

1824, Burchell—Met with two rhino at Britstown.

1826, Steedman—The Great Fish River.

1837, Bunbury—The Fish River Bush.

1838, Harris—Shot many rhino in Bechuanaland, the Western Transvaal, and the Orange Free State.

1842—Record of the last rhino shot in the Orange Free State at Renoster Kop, just south of the Vaal River in Kroonstadt district.

1851, Bryden—Record of a single rhino surviving in the Addo Bush.

1853, Hall—Record of last rhino in the Cape Colony, shot on the Coega River close to Port Elizabeth.

1855, Gordon Cumming—Occurrence of rhino at the headwaters of the Marico River, Western Transvaal.

1873, Sanderson—Still existing in great numbers in the Transvaal Low Veld.

1890, Stevenson-Hamilton—Records that large numbers of rhino were destroyed during the Selati Railway construction in the early 'nineties.

1900, V. Kirby—Still a few in the Matamiri Bush and on the Libombo Range near Olifant's River Poort (E. Transvaal).

HABITS.—Kaokoveld Rhinoceros are partial to bush-covered hill country, with plenty of rocky outcrop over which their tracks wind along the levels and up the slopes. Although lying up during the hottest hours of the day, they are partly diurnal so far as feeding hours are concerned, beginning to browse between 4 and 5 in the afternoon. They visit water-holes, however, and trek mostly by night. When put up they crash through the tangled undergrowth at a clumsy but powerful gallop. Except when heavily asleep at midday, they are fairly quick of hearing.

They often attach themselves to a particular area some ten miles in diameter, as indicated by their winding paths, although readily deserting a locality when hunted, or if the water-hole within its circumference dries up. If the water sinks but an inch or two below the ground, unlike elephant, they will not dig for it, but at once move on to a fresh supply.

Where undisturbed, Kaokoveld Rhino appear to drink at least every night, at about midnight. When rhino and elephant visit the same water-hole, the former invariably give way to the latter. Those particularly favoured by rhino are situated in steep rocky hills and necessitate arduous climbs.

In the Kaokoveld, on account of wallowing habitually in wet or dry limestone pits, rhino are frequently plastered over with a coating of greyish-white mud, which doubtless gives rise to false reports that 'white rhino' still survive in that territory.

Except when females are accompanied by young, they usually go about singly, and a meeting of two or more occasions a variety of indescribable sounds and much apparent resentment. In one instance, when three rhinoceros met at Otjiwau Spring (near Kaoko-Otavi) there was an absolute uproar of excited snorts, grunts, and occasional squeals, although, so far as could be ascertained later, no actual fighting took place.

The climb to this particular drinking place entailed so much loud panting and heavy breathing that the animals could be heard from a considerable distance approaching one by one; although, curiously, until within a few yards of the water-hole, it was quite impossible to ascertain from which directions they were advancing.

A Rhinoceros snorts like a horse when startled or angry, but when badly frightened or wounded it occasionally squeals.

One individual watched by daylight at close quarters was observed picking off young shoots and leaves of low trees with the fastidious deliberation of a giraffe.

Rhino paths in the Kaokoveld are not unlike small elephant paths. They are narrower, and wind about without definite direction for any great distance. Unlike elephant, they do not attempt to straighten them to any extent by breaking down small trees and overhanging branches.

Where the undergrowth is particularly dense, rhino tracks become tunnels

about four feet in height. The paths of rhinoceros and elephant are also used by zebra, antelope and other game, and even guinea-fowl. Thus the spoor of the larger and less plentiful animals is soon obliterated. All rhino spoor seen, except in the mud around their drinking or wallowing places, was invariably recent. The small amount of it was an indication of the greatly reduced numbers of these animals.

Although normally timid, Rhinoceros are at all times excitable, sometimes inquisitive, and occasionally stupidly aggressive. Twice during the Kaokoveld Expedition camp fires were charged by rhino, but on both occasions the shouting and confusion, together with the stampede of the donkeys, caused them to crash off with equal suddenness. A Rhinoceros may be more easily frightened, and therefore less dangerous, under these circumstances than a Hippopotamus, which has similarly been known to charge a fire. Whilst donkeys may stampede at the sight of a rhino, their alarm is short-lived. They do not run for miles, as when frightened by the approach of lion, wild dog, or spotted hyæna. Straker records the visit of a rhinoceros to a camp by night in Somaliland causing a camel stampede.

The Rhinoceros is the only animal in the Kaokoveld the existence of which is seriously threatened by the natives. Around Kaoko-Otavi they systematically hunt them, as they doubtless do elsewhere.

Since Kaokoveld Rhino visit the same water-holes regularly, they are very easily exterminated. The presence of shooting boxes with loopholes for rifles overlooking most of the water-holes indicate that they are relentlessly poached. The survival of the few remaining rhino in the Kaokoveld is entirely due to shortage of ammunition amongst the natives. The Ovashimba Hereros do not profess to be so afraid of rhino as they are of elephant. I could obtain no record of any local fatalities from rhino.

Except for their smaller size, rhino droppings are not unlike those of elephant. When weathered and partly desiccated, their similarly fibrous composition becomes more evident. The droppings of rhino are often deposited in chosen situations, and less frequently along the paths.

The ground in the vicinity is often much furrowed by their horns, although the actual droppings are said to be scuffed about by the hind feet. The peculiar three-toed spoor of a Rhino is very characteristic; it is about 8 inches in diameter, club-shaped (trefoil), and quite unlike that of a Hippopotamus.

According to Neumann, Black Rhinoceros, unlike Elephant, seem to be incapable of recognising the carcasses of their kind. I found quite the contrary in Burma, where one individual (*R. sumatranus*), on coming upon the still fresh carcass of another, turned in its tracks and galloped off with a series of terrified squeals that resembled more the yelping of a small dog than the bellowing to be expected from a beast of its size.

“Kaoko Rhinoceros prefer mountains or rocky localities over which they climb with astonishing facility. They seem less apt to charge than in East Africa, and are usually content to give chase for a short distance only. When charging, a rhino first carries its head high, and finally lowers it. Old rhino trek long distances at certain seasons of the year, but they all seem to have some established headquarters, doubtless the locality in which they were born, to

which they travel back. In the Kaokoveld, rhino are said sometimes to eat grass; they pull it up by the roots and then shake off any attached earth. The droppings are invariably tossed about with the hind feet, and deep scourings in the ground are often found around the depositing sites."—Steinhardt.

"At Gwawetje Watering Place on the Okavango Rhinoceros drink regularly. At Tschbombo on the Lujana (according to Bushmen) they go about in parties of three or four, and lie up by day in impenetrable thickets. Whilst resting the ears are in constant motion. Hearing and scent are good, but sight is extremely poor. When rhino get the scent of human beings they usually break away, although the break may occasionally be made in the direction of danger. They feed upon mimosa bushes, and perhaps also upon roots and creepers. They drink during the night."—Wilhelm.

"In East Africa, Black Rhinoceroses do not confine themselves to thick bush nor, except where persecuted, are they careful to conceal themselves during the daytime. They live scattered over the country in pairs or singly, sometimes three, and rarely four, being found together, but never more. They also keep pretty much, generally speaking, to the particular area embracing their own haunts, and do not migrate from one district to another.¹ It is a mistake to suppose that rhinoceros have any tendency to semi-aquatic habits; they are much scarcer in the parts of East Africa where there is a heavy rainfall, the dry barren wastes seeming to suit them best; here they are equally at home in the dense scrub and in the arid open plains. They are sometimes met with in the forests—on the slopes of the principal mountains and ranges. On the other hand, the Rhinoceros cannot do without water; he must drink nightly or daily (I have many times watched one drink in broad daylight); and, when he can, he likes to take a mud bath. For this reason, though he will wander many miles away in search of food, he is never seen at any great distance from water, and the sight of one of these animals is a sign that water is to be found within a distance of not more than eight or ten miles. They are very fond of rolling in the dust, and, in consequence of this habit, generally approximate in colour to the soil of the country they inhabit; thus in one district the rhinos appear almost white, in another red or nearly black as the case may be. These creatures wander about and feed all night, and, where not much disturbed, during a good part of the day too; though during the hottest hours they commonly sleep, sometimes under a tree, at others quite in the open; but where much harassed by natives, they are seldom or never seen abroad by daylight, but hide themselves away in the densest thickets so that only their spoor betrays the fact of their presence. Although the Black Rhinoceros does not eat grass, in the open country its food consists to a great extent of weeds and plants that grow among the herbage of the plains; and it may at times be seen apparently grazing.² During periods of drought in particular, these animals wander far over the uplands in search of food, coming down during the night to drink at some pool left in the

¹ "The Black Rhino does not make long migratory journeys."—Hobley.

² "It is owing to the fact that this species lives on bush that its range is very much more extended than that of the Square-Mouthed Rhinoceros. It lives exclusively upon bushes and roots, eating not only the young leaves, but also chewing up a good deal of the twig itself."—Selous.

bed of a watercourse many miles distant, to which their well-worn paths converge. When disturbed, in his first rush he makes a great puffing and snorting which is particularly disconcerting in thick cover when the beast is hidden and it is impossible to tell which way he is coming. Both species of rhino will charge with raised tail, the tail being also raised when the animals are excited or frightened. A young rhino, like a young elephant, will charge over the carcass of its mother."—Neumann.

"Rhino lie 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 quite as frequently they are found out in the quivering heat entirely unsheltered from the sun. In hot weather they move off to their watering places—which are often far distant—at sunset, drinking between 6 and 8 p.m. After drinking, they set out for their feeding grounds and browse throughout the night, during which they cover a great deal of ground. In cold weather, and during the dry season, they often get up and feed at once, not visiting the water till midnight or later—this being their only drink for the day; but, in hot weather, they will pay a second visit at dawn to the water, when, if a mud-hole is to be found, they wallow as well. They then seek their midday resting-place, seldom moving about after 9 or 10 a.m., except in the wet season, when I have seen them browsing throughout the day. They feed upon the astringent leaves of shrubs and bushes; roots; and the leaves and twigs of thorny acacias. While eating they make a loud champing noise with their jaws. When disturbed they go off at a slinging trot, with their tails screwed up over their backs; but, if suddenly alarmed or closely pursued, they break into a gallop which only a good horse can keep up with, but which the Rhino can sustain for a long distance. Following them in thick cover is somewhat unsatisfactory, as one is almost certain to be heard by the quick-eared brutes, their keen sense of hearing almost rivalling that of scent. Even if disturbed once or twice they do not go far before halting. Although naturally timid and certainly not dangerously aggressive, the Black Rhino is of uncertain temper, and, when wounded and encountered at close quarters, will charge fiercely; while occasionally it is as vindictive as a buffalo. They are the easiest killed of all the larger game; at the same time it is seldom any use following a wounded rhino, as they keep going on and on for miles until they drop. Some difference of opinion exists as to what a rhino can do on three legs; I have seen a cow, with her fore-leg broken above the knee, travel for over a mile at a pace that could not be kept up with; while another, also with a fore-leg broken, went over six miles.¹ Rhinoceroses utter three distinctive cries: (1) A succession of deep grunts; (2) A 'locomotive' snort, which accompanies a charge or flight when suddenly alarmed; (3) A shrill squeal of approaching dissolution. The Black Rhino often deposits his droppings in saucer-like hollows, which he scoops out under a bush or tree, invariably scattering it about afterwards. These spots are regularly visited—not infrequently by several animals—till a great pile has been collected. Tracks lead from one such 'dumping ground' to another, and deep furrows are ploughed up around them, made, I think, as often by their feet as their horns. They often make crescent-shaped furrows also,

¹ "With a broken hind leg, neither a White nor a Black Rhino can run at all, but I have seen individuals of both species run a mile with a broken shoulder."—Selous.

in the ground, on alternate sides as they walk along."—Vaughan Kirby.

"The favourite haunt of the Black Rhino is hilly country, on the slopes of which there is plenty of thorn-bush. Although normally a browser, I think the Black Rhino eats grass occasionally, for I am sure I have seen digested grass in the droppings. It drinks nightly, I believe, and must travel long distances to water, as it is often seen many miles from a river or water-hole. It has the strange habit of returning to the same spot to deposit its droppings, and after doing so, it rakes them about with its feet and horns. Rhinos are very fond of wallowing in mud, and they often use trees or flat rocks as rubbing posts. More than three are seldom seen together, which will consist of a pair of adult animals and a young one. The Black Rhino has very poor sight; his hearing too is not very sharp, but he has an acute sense of smell—although I do not think he can scent danger nearly as far as can elephants, buffalos, or the antelopes. When disturbed, he always runs up wind. They must fight a good deal in the breeding season, as both sexes are often scarred by long wounds."—Lyll.

"Unlike the 'White,' the Black Rhinoceros is essentially a browser; leaves, twigs, and small roots forming his food. To the casual observer the fact that he favours so greatly the treeless plains of parts of East Africa might point to a diet of grass; but a closer examination of the ground reveals the presence of a small plant which has in reality formed the attraction. In East Africa individuals are often seen standing right out in the open throughout the day. When disturbed the Black Rhinoceros trots away with his head and tail both elevated; a female is followed by her calf in contradistinction from the other variety. Sight is poor, but hearing appears to be fairly good, and the sense of scent is most acute. The droppings which are deposited in heaps, and afterwards kicked about by the hind legs, clearly indicate by the broken sticks and crushed leaves which they contain the nature of the animal's food."—S. Hamilton.

"The Hook-Lipped Rhino is dull of wit and eyesight. Its sense of smell is good, and so is its hearing; but its vision is astonishingly bad. We doubt if it sees better than a very near-sighted man. It is the most stupid of the very big creatures. It seems to have a marvellous memory for local geography, as is shown by the way it will traverse many miles of country to some remote water-hole in the middle of a vast and monotonous plain; and it has the patience to stand motionless for many minutes listening for anything suspicious. But these seem to be well-nigh its only lines of mental effort. Its life is passed in feeding, travelling to and from water, sleeping, and when awake and at leisure either fidgeting, or much more often standing motionless to rest. There is occasional love-making and the exhibition of occasional fits of truculence and petulance or of muddled curiosity. When one rhino comes within ken of another the meeting always betrays bewilderment and incipient defiance on the part of both. They are silent beasts, but very rarely utter a kind of squeal or squeak, apparently when courting. They utter a shrill and long, often a steam-whistle scream when dying; and they make a succession of puffs or snorts while charging or even when only startled. The Rhinoceros gets out of the way of the Elephant. It will unquestionably on occasions charge men and domestic

animals entirely unprovoked. We have been informed of one rhino charging a herd of zebra, and another some buffalo. We have known a rhino charge through a camp at night and cause wild panic; it not infrequently charges hunters or travellers after dark. Although less dangerous than other dangerous game when hunted, the rhinoceros is more prone than any other beast to act aggressively when entirely unprovoked. Unlike the Elephant and Buffalo, it does not haunt the neighbourhood of native villages to make raids on the fields and gardens. Rhino sometimes stand while resting, but they usually lie down, either on their sides or in a kneeling position. They are browsers; their favourite feeding times are in the morning and afternoon. Generally we found the bulls solitary and the cows either solitary or followed by their calves. Occasionally we found a bull and cow, or a bull, cow and calf together. On the Northern Guaso Nyiro we found the rhinos drinking once every 24 hours, at night. In the Sotik they spent their whole time in the bare open plains, drinking at one or other of the widely scattered, rapidly drying little pools. They usually (here) drank at dusk, and again about sunrise. Sometimes during the noon hours they lay out in the open without a particle of cover; sometimes they lay under an acacia or a candelabra euphorbia. The Rhino shows no hesitation in approaching deep water, not merely drinking but bathing in it. The animals are fond of wallowing in mud holes, and also at times in dusty places. It kicks and scatters the droppings about with its hind feet—not its horn: they may be dropped anywhere, if the rhino is travelling much; but where a rhino, as is often the case, is spending its whole time in one rather limited locality, it returns again and again to the same place.”—Roosevelt and Heller.

“Black Rhinoceroses not only occur among mountains but are equally at home in the bush fringing swampy streams. Rhino tracks ‘may’ lead to water, but one can never be sure, as the beast can apparently dispense with a drink for days together. He is not built for speed, but it is surprising how fast he can go over a short distance, though he is no stayer at his best pace. A rhino’s charge down wind is always very deliberate, being more in the nature of investigation than purposeful attack. The alarm note is something like that of an impala, except that the impala utters it once, and the rhino three or four times. When alarmed it gallops off with its tail up.”—Percival.

As recorded by Percival, the Black Rhino has a habit of micturating against certain rocks, which gives them a whitewashed appearance with a hard shining surface.

“The Black Rhinoceros frequents bush-covered country more than open grass lands, and is often found in rocky or stony districts. It is generally solitary, though occasionally associating in small family parties. It sleeps by day, sometimes in dense thorny thickets, sometimes under the shade of a solitary tree or a large rock in the open plains. When disturbed it makes off in any direction, usually down-wind, but after a short way gradually wheels round up-wind, its pace being fairly good, better than that of the square-mouthed species. When moving along it holds its head high up, and, if a calf is present, it follows its mother instead of preceding it. Scent and hearing are very keen, but its eyesight is exceedingly poor.”—W. Sclater.

"A Black Rhinoceros in the London Zoo lived for about 23½ years. Indian Rhinoceroses (*R. unicornis*), however, have been recorded to live for 40 years and over. An individual in Bengal is said to have attained an age of about 47 years."—Flower.

BREEDING HABITS.—Very little has been recorded about the breeding habits of any species of rhinoceros.

"There is no regular breeding time; the calf may be produced at any season. It follows its mother within a very few days, or even hours, of its birth. Apparently the cow does not permit her old calf to stay with her after the new calf is born. We never saw a cow with two calves of different ages (or, for the matter of that, of the same age); yet many times we saw a cow followed by a half-grown or more than half-grown beast that must have been several years old."—Roosevelt and Heller.

"I have seen a rhino calf about fourteen days old on October 28th; and another on November 2nd about a month old. On the other hand, a cow shot in October had a four or five-months'-old calf with her, and I am inclined to think they are usually born at the end of the rainy season. The period of gestation is probably from 16 to 18 months."—Vaughan-Kirby.

"The mating season is probably during the early rains (November to December). Young are born between January and February. The young suckle for two years, sometimes longer. Period of gestation 18 months."—Wilhelm.

DESCRIPTIVE NOTES.—*Diceros occidentalis* may be a somewhat smaller race than typical *bicornis*. Wilhelm notes that Caprivi and S.E. Angolan Rhino are larger than Kaokoveld specimens. In the specimen of *D. b. occidentalis* in the Kaffrarian Museum the ears are only scantily fringed with hair, less so than those of a second specimen from S.E. Angola.

The horns of Kaokoveld Rhino are said to average no great length, although Powell-Cotton records a specimen from the Cunene, in Angola, with an anterior horn of 30½ in., and a posterior horn of 16½ in., this being doubtless a female, although still indicating an occasional good horn length in *D. b. occidentalis*.

The horn lengths of the subadult male specimen (*D. b. occidentalis*) in the Kaffrarian Museum are, anterior 11½ in., posterior 6½ in.

One five-horned and several three-horned black rhinoceros are on record. In one three-horned specimen from Northern Rhodesia the anterior horn measured 20 in., the middle horn 10¾ in., and the posterior horn 5¾ in.

In another three-horned specimen recorded by Straker the horns measured 15, 13, and 3 in. respectively.

In the five-horned record the three extra horns were not all in line, but sprung from the bases of the normal ones; all were of good length, the shortest being 9 in.

"The Black Rhinoceros has not received its common English name because its coloration is actually blacker than that of the other species, but rather to contrast it with the other African Rhinoceros which has been so unfortunate as to

have the designation 'white' bestowed upon it. Under these circumstances we may describe the Black Rhinoceros as slightly blacker than the White one, but both would be considered black in colour by the average observer."—Roosevelt and Heller.

Mammæ, 2 (ing.).

Horn Records.—The four longest anterior horns recorded by Rowland Ward all came from East Africa:

(1) 53½ in. (C. H. Orman); (2) 47 in. (S. L. Hinde); (3) 44½ in. (Vienna Museum); 44 in. (F. Holmwood).

The longest anterior horn recorded from South Africa measures 41½ in. (W. Coke—Zululand).

"A good average anterior horn is 20 in."—Lyell.

"The vast majority of rhino have short horns, under a foot, and anything over 18 in. is uncommon."—Neumann.

The four longest posterior horns (Rowland Ward) measure as follows:

(1) 29½ in. (R. B. Keeling—South Africa); (2) 27½ in. (N. Rhodesia); (3) 25½ in. (H. Sampson—East Africa); 22¼ in. (S. L. Hinde—East Africa).

"Cow rhino horns are usually longer, but more slender than those of the bulls."—V. Kirby.

The longest horns recorded by Rowland Ward are unsexed, and are probably all females. The maximum length of horn attained by a 'bull' Black Rhino does not appear to have been specially recorded.

Wilhelm records a Hukweveld (Central Caprivi) rhino with an anterior horn measuring 250 mm. in length.

Weight.—'About 2 tons' (Lyell). 1 ton 148 lb. = 2,148 lb. (avoirdupois?) (Meinertzhagen). 1,080 lb. ♀ (New York Zoo).

Estimated weight of a male (subadult) specimen of *Diceros bicornis occidentalis* (in the Kaffrarian Museum) ¾ ton.

Shoulder height.—(Males) 5 ft. 4 in. (average)—(Kirby).

(Two large specimens) 5 ft. 8¼ in., and 5 ft. 7¾ in. (Kirby).

5 ft. 5 in. (Jackson); 5 ft. 6 in. approx. (Lyell); 5 ft. 3 in., and 4 ft. 9 in. (Neumann). 5 to 6 ft. (Ward).

About 5 ft. (Hamilton); 4 ft. 9 in. (Roosevelt).

(Females) 4 ft. 10 in. (Kirby); 5 ft. 1 in. (Roosevelt).

Shoulder height of a male (subadult) specimen of *Diceros bicornis occidentalis* (in Kaffrarian Museum) 1,510 mm., croup 1,500 mm.

(Wilhelm estimates that Hukweveld Rhinoceros equal East African in size, and may have a shoulder height of 1,550 to 1,700 mm., and a body-length of 3,500 mm.)

The White Rhinoceros

Ceratotherium

Ceratotherium Gray, 1867, P.Z.S., p. 1027; genotype *C. simum* Burchell, 1817, Bull. Soc. Philom., Paris, p. 96.
The White Rhinoceros from Bechuanaland.

White Rhinoceros—Witrenoster

Ceratotherium simum Burchell

CERATOTHERIUM SIMUM.

Rhinoceros simus Burchell, 1817, Bull. Soc. Philom., Paris, p. 96.

Type (not in existence) from near Kuruman, Bechuanaland.

NATIVE NAMES:

Bechuana: *Chukuru* (Selous); *Chukudu* (Millais); *Tschukurru* (Zukowsky);
Kuabaoba (Bryden).

Nama Hottentot: !*Navas*, !*Nawas* (Krönlein).

!Kung Bushman: !*Naba* (Bleek); *Naba* (Zukowsky).

||K'au||en and Naron Bushmen: !*Naba* (Bleek).

FORMER DISTRIBUTION IN SOUTH-WEST AFRICA.—Beyond any reasonable doubt the White Rhinoceros has been extinct in South-West Africa for the last 50 years or more; since then no actual occurrence has been recorded. The supposed survival of a few 'White Rhino' in the (mountainous) Kaokoveld is evidently due to mistaken reports. The Black Species has a habit of wallowing in limestone pits and naturally becomes tinged with white, after doing so.

In S.E. Angola, the Caprivi, Ngamiland, and other adjoining regions, the local, originally distinctive, native names for the White Rhinoceros were not dropped after its extermination, but remained in use as alternatives for the surviving Black Species.

Steinhardt and Wilhelm's notes (*cf.* Zukowsky, 1924, Archiv. Naturg.) are doubtless based on hearsay evidence, or it may attribute to the present confusion of native names, all of which, to-day, refer to the Black Rhinoceros. In the Kaokoveld, according to Steinhardt, the 'White' Rhinoceros is 'rarely' found in the eastern end of the Omuhonga Range, Ombombo, to the east of those mountains being also mentioned.

According to Zukowsky, as ascertained by Mattenklodt in 1906, White Rhino are 'very rare' at Lujana (S.E. Angola) in the Tschbombe Bush.

According to Schulz and Hammer (The New Africa, London, 1877), they were plentiful in that region in the 1870's.

"White Rhino formerly existed on both sides of the Okavango, and a few may survive still along the Kwando. There are no recent records."—Wilhelm.

According to Selous, the White Rhino was never found in Southern Africa north of latitude 17 south.

GENERAL DISTRIBUTION.—Zululand: At the present time apparently confined to the triangle formed by the junction of the Black and White Umfolozi Rivers, an area of about 130,000 acres.¹

A few years ago there were believed to be only about 20 White Rhino left in Zululand, but more recent estimates give a larger figure. Warren (Nov., 1930) estimates the number at about 50.

Lang, as a result of an official count in Nov. 1929, estimated the number to be 120 and was of opinion that there might be 150. Recently they have been also recorded from Hluhluwe Reserve, north of the Umfolozi Reserve.

Southern Rhodesia.—“As regards the White Rhino, I have very definite information that about 7 of these animals still exist on the Portuguese-Nuenetsi Border; they have not been seen by Europeans, but well-trained native shikaris have reported them on several occasions, always using the name *M'fura* (the original local name for the species). These are stated ‘not’ to be *Chipamberi* (i.e., ‘The Dancer,’ or Black Rhino, so called from its stamping method of disposing of an enemy.)”—J. F. Fleming, Salisbury, S. Rhodesia, Jan. 12th, 1931.

C. s. cottoni: “Range, only in a very small district of Uganda, west of the Albert Nile (the southern portion of the one-time Lado Enclave), and in small portions of the adjacent S.W. Sudan and N.E. Belgian Congo; possibly also in the eastern extremity of French Equatorial Africa. Estimated number from 130–150 individuals. Powell-Cotton, in 1904, only found the species in a very restricted part of south Lado. Nowadays it can be found throughout the length of the left bank of the Albert Nile (Bahr-el-Jebel) in Uganda—from Albert Nyanza to Dufile. Three were seen near Dufile on the Sudan Border in 1925, but none have been recorded from that district since. Two marches up the Nile from Rhino Camp—and farther south, there were plenty in 1925, though in 1928 there was scarcely one: later, in the same year, many were reported.”—Pitman.

“Range, the west side of the Nile, from the Arau River opposite Wadelai northward through the Lado Enclave, along the west bank as far as Shambe, and west across the Bahr-el-Ghazal Drainage to the Dar Fertit Country, but not known to extend beyond the Nile Watershed. The most northern record is one reported by Selous west of the Shambe. Far westward several hundred miles we have a further record by Mahon of one shot in the Dar Fertit Country near the headwaters of the Bahr-el-Ghazal Drainage. Explorers have reported the occurrence of White Rhinoceroses in various parts of Equatorial and Central Africa outside the ranges here designated. Such records have all been found to be due to mistaken identity or confusion with the Black Species. The best known of such instances are the references of Speke, Grant, and Stanley, to White Rhinoceroses in Karagwe (Tanganyika Territory). The first Nile specimen to reach Europe was a skull collected by Gibbons near Lado Station in 1900.”—Roosevelt and Heller.

¹ “The area included within the Mfolozi Reserve is about 75,000 acres, and that to the south of the White Mfolozi about another 15,000 acres. From time to time evidence has been adduced which indicates that there may be a few of these animals, probably not exceeding five or six in number, in the dense bush at the north end of False Bay, but I have never yet been able to confirm this.”—Vaughan-Kirby (Ann. Durban Mus., 1920, vol. II, pt. 5).

White Rhino have been recorded from the Lake Chad District by Fresnel and Smith. Rowland Ward records specimens from Mongalla, the Belgian Congo and 'The Cameroons' (Rothschild).

"*C. s. cottoni* is more widely distributed than was formerly thought to be the case, specimens having been shot as far south as the (Northern) Congo. In the British Sudan comparatively few individuals now survive; I should fancy that those along the left bank of the Bahr-el-Jebel can scarcely exceed a score. Farther westward, along the Nile-Congo Divide, from about Yei in Western Mongalla to the point in the Bahr-el-Ghazal some distance north-west of Tembura, they are more numerous. In the Meridi and Yambio Districts in 1916 I came upon them many times. On the Congo side of the Divide, up to and beyond the Franco-Belgian Boundary at the Mbomu River I found them much more common than anywhere on the British side. Quite a number of bleached skulls were observed north of Aba. Westward of Aba, and more or less throughout the whole of the upper Welle District, I met with these skulls almost daily."—Christy.

"The Nile appears to be a barrier between the respective ranges of the Black and White Rhinoceroses in the Sudan, the former inhabiting the east side and the latter the west, each being exclusively confined to its own side."—S. Hamilton.

HISTORICAL.—(S.W. Africa): The fact that the Nama Hottentots and local Bushmen had distinguishing names for Black and White Rhinoceros¹ indicates that both species formerly existed in Namaqualand, Gobabis and Grootfontein Districts, and elsewhere in the more level parts of South-West Africa: if the White Species ever inhabited the mountains of the Kaokoveld is more doubtful: Selous records only once having seen a White Rhino in rocky hill country, and was of opinion that it must have wandered there by accident.

Zukowsky records horns of White Rhino from the sands of the Omaruru and lower Ugab Rivers, and from near Usikos. There is an incomplete, much-weathered skull of a White Rhino in the Windhøk Museum (without history) which presumably came from some part of South-West Africa.

As early as 1801, Barrow recorded the 'supposed' occurrence of this species in Namaqualand. Andersson (1850-1854) found White Rhinoceros very numerous in the country 'west' of Lake Ngami, and shot nearly 60 of both species, thereabouts, in one season.

Livingstone (1857), and Baines (1864), met with White Rhino near Lake Ngami.

"Twenty years ago the White Rhinoceros seems to have been very plentiful in the western half of Southern Africa. Now it must be almost extinct in that portion of the country. This is not to be wondered at when one reads in Andersson and Chapman's books of their shooting as many as eight of these animals in one night as they were drinking at a small water-hole; for it must be remembered that these isolated water-holes at the end of the dry season represented all the water to be found over an enormous extent of country, and that, therefore, all of the rhinoceroses distributed over many hundreds of square miles were, in

¹ Miss Bleek refers !*Naba* of the ||K'au||en and Naron Bushmen, and !*Navas* of the Nama Hottentots to the 'White Rhinoceros.'

times of drought, dependent upon perhaps a single pool for their supply of water. According to all records between 1840 and 1850, White Rhino were very abundant all over the country, wherever there was water, to the north and west of the Limpopo between Secheli's Country and Lake Ngami. In 1867, during several months hunting in the country to the south of Linyanti, on the River Chobe, I only saw the spoor of two Square-Mouthed Rhinoceroses. In 1874, during eight months spent hunting on and between the Botletli, Mababe, Machabe, Sunta, and upper Chobe Rivers, I never saw the spoor of one of these animals, and all the Bushmen I met with said they were finished. In 1884, one was met with by natives near the reed-bed in which the Mababe loses itself, this being the last I ever heard of from any part of western South Africa."—Selous.¹ (1881).

OUTSIDE SOUTH-WEST AFRICA.—There seems to be no authentic historical record of the existence of White Rhinoceros anywhere south of the Orange River.

According to Rowland Ward, the White Rhinoceros was exterminated south of the Orange River early in the 18th century, but no authority is quoted.

Pringle (1822) mentions two supposed varieties of rhinoceros in the Eastern Cape, but, as already pointed out by Hewitt, it is doubtful if either of these could have been referable to the White Species.

An imperfect skull of a White Rhinoceros (now in the South African Museum) was dug up about 12 miles from the Vaal River (Kimberley Dist.) in 1893, this usually being regarded as the most southern authentic record.

In 'Rock Paintings of South Africa' (D. F. Bleek, 1930) there are reproductions of two Bushman paintings of rhinoceros from the Eastern Cape Province, which may possibly have been intended to represent the White Species: (1) From a cave at Rietfontein, Mostert's Hoek, Tarka Dist. This painting shows a rhinoceros with an elongated head and two slender horns, a giraffe is also shown alongside: (2) From rocks on the banks of the White Kei near St. Mark's Mission Station. A painting of a rhinoceros with a single curved anterior horn, but with a head not specially elongated.

There are many other Bushman paintings and engravings of White Rhinoceros in caves north of the Orange River.

Historical chronicle of the extermination of the White Rhinoceros throughout Southern Africa (except Zululand):

1743, Parsons (Phil. Trans., pl. III, fig. 6, horn figured)—The first record of the White Rhinoceros.

1801, Barrow—Supposed occurrence in Namaqualand.

1812, Burchell—Recorded from the Balatpan Country, not far from where Kuruman now stands (Lat. 26 South, approx.).

1822, Campbell—Recorded from Mashow, Bechuanaland.

1835, A. Smith—White Rhino already driven north from the neighbourhood of Kuruman.

1838, Harris—Met with along the Marico and Limpopo Rivers.

1856-1857, Baldwin—Records from Marico and Amatongaland.

¹ Notwithstanding slaughter by Europeans, Selous attributed the extinction of the White Rhinoceros in Bechuanaland primarily to the rapid increase of firearms amongst the natives.

"During the seventies and early eighties, the White Rhinoceros was practically exterminated in Ngamiland, Matabeleland, and Mashonaland, where it had formerly been exceedingly common."—Sclater.

Selous (1882) shot a specimen, the head of which is preserved in the South African Museum, between the Bembesi and Sebakwi Rivers, half way between Bulawayo and Salisbury. At approximately the same date, A. Cross, who was Selous' companion at the time, shot two males, the anterior horns of which are now in the Kaffrarian Museum.

Coryndon (1895) records 15 White Rhino having been shot in Matabeleland, and himself shot three, in 1892-93, two of which are now in the British and Tring Museums.

Eyre (1895) shot a female just north of the Ayrshire Mine near Mazoe—now mounted in the South African Museum. Lincoln Tangye saw this specimen in the flesh, and believes it to have been the last record from Rhodesia.

Two more of Selous' specimens (horns, in the British Museum) were obtained from Thamma Setsi (between Tete and the Victoria Falls), and from between the Umniati and Umzweswi Rivers respectively.

Selous, who met with White Rhino around Bulawayo, first saw their spoor near Mangwe, about 60 miles southwest of that town in 1872: in 1873 he found them plentiful to the south of the mountainous country which extends eastwards from the Victoria Falls to the Gwai and Tchangani Rivers.

"In 1871 White Rhino were still numerous in the uninhabited districts of Matabeleland and Mashonaland. In the country to the north-east of Matabeleland, between the Sebakwi and Manyami Rivers, they were still numerous in 1878, in which year I saw five together; and their numbers only commenced to be seriously reduced after 1880. In 1886 ten White Rhino were shot between the Angwa and Manyami Rivers, and in the following year I saw the tracks of two or three. In 1878 and 1880 I still found them fairly numerous in a small tract of country in North-East Mashonaland, between the Umniati and Hanyani Rivers."—Selous.

"Eighty White Rhinoceroses were seen in the Transvaal by Cornwallis-Harris in 1836 during a day's march through the Magaliesberg District, and later, twenty-two in a single day in the Limpopo Valley. Smith, in one day's trek—to the north of Magaliesberg, encountered between 100 and 150 rhinoceroses, half of which were probably the Square-Mouthed Species. During 1847 and 1848, Oswell and Vardon are credited with having killed 89 rhino, the majority of which were probably the Square-Mouthed Species."—Lydekker.

"White Rhinoceroses were formerly very abundant in the north-western portions of the Transvaal. Between 1878 and 1880 they were recorded from the neighbourhood of the Sabi River."—Selous.

"As regards species indigenous to the Transvaal Low-Veld, the only one completely lost has been the White Rhino."—S. Hamilton.

"At one time the species ranged over a vast tract of country in South Africa, from the Vaal River to the Zambesi, and there is not wanting evidence that it once ranged far south of even the Vaal River, while to the west it extended into Damaraland. On the east coast it occurred from Zululand up to

the Zambesi, above where the Shiré River enters the latter from the north, and in 1904 the writer found two incomplete skulls near that spot, in the Mwanza Bush."—Vaughan-Kirby.

There is evidence that the White Rhinoceros formerly extended as far north as Algeria. Péringuey (Trans. South Afr. Philos. Soc., 1906, vol. 16, p. 405, fig. 14) has identified a petroglyph (photographed by Flamand and first figured by Pomel in L'Anthropologie, 1892, vol. 3, pp. 145-46, figs. 1 and 2) from Ksar el Ahmar, S.W. Algeria, with *Ceratotherium simum*.

H. Lang (Recent and Historical Notes on the Square-Lipped Rhinoceros, Journ. of Mammalogy, Aug. 1923, vol. 4, No. 3, pp. 155-163) points out that the engraving is presumably that of the Quaternary Algerian form of Rhinoceros, which Pomel ('*Rhinoceros quaternaires*,' Carte Geol. Algerie Paleontologie, 1895, pp. 1-49) described as *Rhinoceros (Atelodus) mauritanicus*; and that, so far as can be judged from a careful comparison of the molars and bones figured by Pomel, these agree closely with those of *C. s. cottoni*.¹

Boule (L'Anthropologie, 1900, vol. II, p. 8) is inclined to ascribe the fossil remains of rhinoceros found at Lake Karar, south-west of Oran, to *R. simus*; and also attributes Pomel's *R. mauritanicus* and *subierrmis* from the beds at Palikao and Ternifine, and elsewhere in Algeria, to the same species. Lang concludes that the designation of these Quaternary north-west Rhinoceroses should be *Ceratotherium simum mauritanicum* (Pomel, fig. 1).

The distinction of *mauritanicum* from *cottoni* is largely a matter of faith.

HABITS.—"White Rhinoceroses used generally to be met with in pairs or families; a bull and a cow with a calf, or two calves of different ages. In the old days, when very numerous, no doubt several pairs or families were often attracted by the same piece of pasture, and, when feeding there together, would have presented the appearance of a herd. In disposition the White Rhino was undoubtedly sluggish, timid, and, as a general rule, the reverse of vicious.² Like all other rhinoceroses, it was an inquisitive animal, and would occasionally approach camp fires at night to within a distance of twenty yards. They spent the greater part of the day sleeping in some shady place, either standing, or, more usually, lying down like enormous pigs. In the afternoon, as the sun got low, they would wake up and begin to feed down to the water, and I have so often seen them drinking just at sunset, both during the cool season and in the hot weather, that I fancy it was their usual habit to drink before dark, although farther west, in Bechuanaland, where, during the dry season, the animals were obliged to collect in large numbers around the few permanent water-holes, they appeared to come to them at night. Although their eyesight is very bad, they always seemed to be quick at hearing; their sense of smell too, as with the black species, was acute. When alarmed, they would start off at a swift trot, while, if pursued on horseback, they would break into a gallop and maintain a speed, for a considerable distance, astonishing in animals of their huge bulk. They were

¹ *Rhinoceros simus cottoni* Lydekker, 'The Field', 1908, Feb. 22, vol. CXI (III ?), p. 319; typically from the Lado Enclave.

² That a White Rhino, especially when wounded, will occasionally charge has been established. Oswell records an instance of one charging him and killing his horse.

easy animals to kill, although, if not mortally wounded, it was very little use trying to follow one of them up. If a cow accompanied by a young one was shot, the young one would charge as an elephant calf will. Not only when feeding, but at all other times, the White Rhino holds its head very low, whether walking, trotting, or galloping. I consider the meat to have been superior to that of any other game animal in Africa."—Selous.

"The White Rhinoceros is apparently of a far more sociable disposition than the Black Species, as it is frequently to be met with in parties of five or six in number, but if these are disturbed, it will be noticed that they usually separate and go off in different directions, two or three together, indicating that their being together was a more or less fortuitous circumstance, perhaps due to the discovery of some mutually satisfactory bit of grazing. It is, however, more usual to meet with a pair, or a family party of three or four. The latter would include an adult bull and a cow, a large calf, probably three parts grown, and a young animal six or eight months old. White Rhinoceroses in Zululand prefer a mud bath to bathing in clear water, though whether that is due to the 'brak' nature of all the water in the Reserve is not clear. But no mud-hole in the vicinity of their haunts will ever be found in which signs of recent wallowing by these huge creatures will not be obvious. On the other hand, their drinking places at clear streams very seldom bear any trace of their having bathed there. The White Rhinoceros usually drinks between midnight and 6 a.m., though I have seen them drinking at various times between 8 and 10 a.m., and it never appeared that the weather conditions had anything to do with it. In the late afternoon they feed their way down to their drinking places, which, except in very dry seasons, when only one or two water-holes are available, are very seldom visited by the same animal on two successive occasions. After drinking they make off in the direction of their feeding grounds which are usually at a great distance, seldom grazing on the way till they have covered at least three or four miles. White Rhinoceroses feed up against the wind, moving slowly. As the hours pass on towards daylight, they draw nearer to the spot where they intend to lie up for the day, but, if the weather is warm they seldom feed much after about 9 a.m., when they move to a shady tree or patch of bush, and there they will stand for an hour or two, with their heads lowered and scarcely any sign of movement, save the constant flicking of the long ears, round which the biting flies, which worry them incessantly, congregate. They may then move off again for a short distance, seldom more than a few yards, or lie down on the spot where they have been standing. Sometimes they lie down on their sides, at others they sit up with their legs doubled under them. They will also rest and sleep when standing, and in either position are absurdly easy animals to approach, though particularly so when lying down. I have seen them lying during the scorching midday heat on open shadeless flats, in low scrubby bush scarcely 2 ft. high, with the blazing sun pouring down upon them: and I have found them far in the darkest recesses of the thorn jungles, into which it is difficult to make one's way. They are never found at rest on rocky kopjes however, nor can an instance be recalled of finding them sleeping on high open ridges. It has always appeared to me that the White Rhinoceros of Zululand is a more decidedly bush-loving animal than it is elsewhere. The writer has never

met with these animals high up on rocky hills, such as the Black loves to clamber about upon, nevertheless, when put to it, they can negotiate uncommonly steep and rocky places with agility. They travel about amongst the foot-hills, however, here and there ploughing up long furrows with their horn as they walk along. The White Rhinoceros is very much less active than the Black, and more deliberate and heavy in every movement, the only action which it appears to perform smartly is that of getting on its feet from a lying down position, and it is really wonderful how quickly that is done. When satisfied that danger threatens, the animal wheels round and makes off at a swinging trot, its tail screwed tightly above its back. The White Rhinoceros shares with the Elephant a perfectly marvellous adaptability for getting away, even in the densest cover, with almost uncanny silence. In Zululand the habitats of the White and Black Rhinoceros do not overlap, or at least not to any extent. The two species, however, seemed to have mingled together in former days in Rhodesia, but it is noted that Heller remarks that in the Nile regions neither encroaches upon the habitat of the other. White Rhinoceroses, like all other game animals, are very partial to the young grass which springs up after the old grass has been burnt off. Their powers of sight are extremely limited. At 50 yards even they are unable definitely to make out a slow moving object. At 100 yards it is very questionable whether a slowly moving object can be seen by them. Stationary objects must be between 25 and 30 yards distant before the animal can plainly distinguish them. To compensate them for this defective power of sight they possess a wonderfully acute sense of smell, and under favourable conditions can wind a person at a distance of fully half a mile. The sense of hearing, while considerably less acute than that of scent, is greater than their powers of vision. The circumference of the spoor of three White Rhinoceros bulls taken in damp hard sand were 31, 33 and 35 in. respectively, that of the Black Species under similar conditions is about 26 or 27 in. In both species the spoor of the hind-foot is smaller and more oval in shape than that of the fore-foot, but there is considerably less difference between the relative sizes of fore and hind-foot spoor in the case of the White than in that of the Black."—F. Vaughan-Kirby ('The White Rhinoceros—in Zululand'—Ann. Durban Mus., 1920, vol. II, Pt. 5, pp. 223-242).

"The White Rhinoceros is seldom found at any great distance from water. He is probably entirely a grass eater, feeding in the late evening, through the night, and in the early morning. He moves steadily along at a slow walk all the time he is grazing, not remaining more or less in one place to do so, as is the habit of many animals. On the sun getting hot he lies down under some convenient tree to sleep soundly through the warmer hours of the day. Sight and hearing both appear rather deficient, but scent is keen. When on the move the head is carried so low that the horn is almost parallel with the ground. The calf precedes, instead of following, the mother, and is guided by a gentle pressure of her horn on its rump. The droppings are deposited in the same spot after the manner of the other species."—S. Hamilton.

"The greatest number of White Rhino I have seen together is seven; one bull, three cows, each with a tiny calf. Investigations indicate that the sexes

are equally divided. The bulls fight savagely in the rutting season and frequently get terribly knocked about. Their sight is bad and, like the Black Rhino, they are extremely inquisitive. When getting up from the ground it is usual for the hindquarters to be raised first, leaving the creature for a moment on its bent forelegs, but I have also seen it come up on straightened forelegs sitting on its haunches. I have seen a hippopotamus in a wild state assume this posture.¹ Conditions of drought do not necessarily drive these animals to the Nile; in fact all available evidence and our investigations tend to show that they avoid going to that river to drink. It is not running water that they require so much as mud wallows; and the absence of these wallows or pools in semi-dry water-courses quickly drives them out of a locality. They are also partial to rolling in sandy river-beds. To the uninitiated the countless tracks that are so often seen in a small locality would suggest the presence of dozens of animals. It is on such misleading data that entirely erroneous and optimistic estimates of White Rhinoceros numbers are often based.² They have the same habit as the Black Species in resorting daily to well-used middens, and the same habit of scattering the droppings with their hind legs. In composition the droppings are absolutely unlike those of the Black Rhino—being black outside and horse-like, the creature being a grazer and solely a grass feeder.³ It appears not to be particularly susceptible to disease and it is noteworthy that virulent outbreaks or rinderpest which have swept through its Uganda habitat, creating havoc among the buffalo herds, etc., have left it unscathed.”—Pitman.

“We found White Rhinoceroses rather more gregarious than the common kind. Once we found four, and once five, together.⁴ They went to water, either at the Nile or some pond, during the night. They would then feed slowly back into the dry wastes.⁵ About ten o'clock they lay down under some tree; occasionally standing motionless in the half-shade for an hour at a time. Usually we found them lying on their sides, but sometimes kneeling. When roused they sometimes jumped at once to their feet, and sometimes sat up on their haunches like a dog. About mid-afternoon they rose from sleep and began to feed, making their way towards the water after nightfall. They fed a good deal during the night also. They are purely grazers, grass feeders, and live only where there are great plains covered with the dry African pasturage. In walking they held their heads very low, the huge square muzzles almost sweeping the ground. They trotted and, if alarmed, galloped at some

¹ One of the few photographs taken of 'Huberta' show it sitting up on its haunches like a pig.

² It is to be hoped that recent estimates of the number of White Rhino in Zululand are correct.

³ Vaughan-Kirby also remarks on the difference between the droppings of Black and White Rhinoceroses, describing those of the former as reddish-brown, and of the latter as greenish when fresh—similar to those of zebra. He records that, although the White Species in Zululand does not systematically deposit the droppings in heaps, and never disturbs or scatters them, yet, as often as not, an animal may visit one spot over and over again for the purpose. A particularly large 'dumping ground' is mentioned, consisting of a hollow scooped out in the sandy soil (roughly oval in shape, about 11 ft. in length by 7 ft. in width, and about 2 ft. deep), in which had been deposited the droppings of one or more animals during a period of probably two or three months.

⁴ Gordon Cumming records having seen upwards of a dozen congregated in Southern Africa.

⁵ “Sometimes their nocturnal rambles lead them quite a distance, a ten mile tramp nightly being a conservative figure.”—Lang.

speed. They were slow, dull, stupid beasts, rather mild-tempered, and not as nervous and irritable as the Black Rhinos, and their eyes were even duller.”—Roosevelt & Heller.

“The Square-Lipped Rhinoceros is the only one of the five known species which has never been brought into captivity.”—Lang.

BREEDING HABITS.—“White Rhino must be slow-breeding animals, as, although I have often seen a cow accompanied by a calf at least three-quarters as large as herself—which must have been several years old—only a small number of these had a small calf with them as well. I once saw a cow with two three-parts-grown young ones with her, both about the same size, and presume they were twins, which I should imagine to be of very rare occurrence. I have seen newly-born calves in August.”—Selous.

“Calves accompany their dams till practically full-grown; a calf remains with its dam till the birth of the next, when Number One is evidently turned away; and Number Two does not usually arrive until Number One is practically full-grown. Investigation suggests that calves are dropped about the end of or early in each year just after the annual grass-burning.”—Pitman.

“We have very little reliable information concerning the breeding habits of the White Rhinoceros, and such as we do possess has caused considerable divergence of conclusions. The generally expressed opinion is that it breeds very slowly, but Heller, basing his conclusions upon the evidence gathered on the Smithsonian Nile Expedition, opines that the reverse is the case. In Zululand there is no doubt that this animal breeds very slowly. Heller points out that in the Nile region ‘the adult female is seldom found without a calf.’ This conclusion also obtains in Zululand. I have occasionally seen two calves with the mother, the elder of the two being an animal, as I should judge, of between four and six years old, and the younger less than a year. I am disposed to think that the native report that the female White Rhinoceros hides its young in dense cover for some time after birth may be true. Certainly I have never seen a very young calf, that is to say less than two to three months old. Careful observations lead to the conclusion that the young may be born at any time of the year, and that there is no particular calving season.”—Vaughan-Kirby.

“In Rhinoceroses the period of gestation is generally estimated at 17 or 18 months. But in any case the rate of breeding is not as slow as believed. It is almost certain that they breed at 4 or 5 years of age.”—H. Lang.

DESCRIPTIVE NOTES.—“The colour of a normal individual of the ‘White’ Species is really very little lighter than that of the so-called ‘Black’ Rhinoceros, and it is fairly well-known at this time that neither is black and neither white. When standing on a ridge exposed to the slanting rays of the morning sun they look absolutely white, and as these animals would have been first encountered by the early Dutch hunters on the open grass downs of the Vaal and Orange Rivers, and would thus be frequently seen under such conditions, it is possible that its present familiar, though inappropriate, name thus arose. Seen in good moonlight, it may be mentioned, the White Rhinoceros appears really white, more so than in strong sunlight. The shape of the ear-conches is markedly

different in the two species, being much rounded in the Black, and having their outer edges very hairy, whereas in the White the very large ear-conches are much elongated and pointed, with a few bristly, stiff, and somewhat curly hairs at the extreme tips. In the latter species also the lower edges of the conches meet to form a sort of tube. Other external characters which at once attract the attention of the observer, in addition to the length of the head and the shape of the muzzle, are the huge muscular hump on the nape of the neck, and the comparative paucity of hide folds on the body, which are far less conspicuous than in the Black Species. There is a fold behind the elbow, less conspicuous in some positions of the body than in others, and one at the back of the thigh, below the buttock. A heavy fold passes over the nape of the neck, and a longer, but less heavy one encircles the throat. The conspicuousness or otherwise of these two folds depends upon the position in which the animal carries its head. Yet another character which the White Rhinoceros shares in common with all living species is the flattened, compressed ridge of hide which stands out along the front edge of the thigh, and is of considerable thickness. The average height of a White Rhinoceros bull exceeds an average specimen of the Black Species by less than a foot."—Vaughan-Kirby.

"Actually the White Rhinoceros is a dirty grey, but to the eye it varies from black to earthy brown, dull whitish, and even deep red, according to the colour of the mud in which it has been wallowing. It is certainly lighter in hue than the Black Species, though as seen in the field there is no apparent difference."¹—Pitman.

Although the White Rhino is usually considered to be the third largest land animal, Roosevelt believes the Hippopotamus to come next to the Elephants in weight: Pitman suggests that the Indian Rhinoceros (*unicornis*) may exceed the African White Rhino in dimensions.

"In size the sexes are very similar, the male exceeding the female but little. The usual length of the front horn (in *cottoni*) is two feet. The rear horn is usually low, sharply conical, and considerably compressed. It seldom exceeds more than a few inches in length and is occasionally wanting. The young at birth are no more hairy than the adults, possessing only the ear and tail fringes of coarse hair."—Roosevelt and Heller.

"The bulls never carry the extraordinarily long, although far more slender horns that the cows do. The rear horn is usually a good deal smaller than the front one, and may be reduced to a mere boss, or even be practically absent."—Selous.

¹ Pitman ('A Game Warden among his Charges,' p. 1, footnote) writes:

"It has been pointed out that 'white' may be a corruption of the Dutch word 'widg,' meaning great."

I forwarded this note to an authority on Afrikaans and received the following reply:

"The word 'widg' does not and never did exist in Dutch, but is most likely of Scandinavian (probably Danish) origin, and it is most unlikely that Scandinavian influence could possibly have had any bearing on the use of the words 'White' Rhinoceros (*Witrenoster*). Personally I am convinced that this animal received its name merely because it was slightly lighter in colour than the so-called 'Black' Rhinoceros, which impressed those responsible for the name to such an extent that they called it 'white' in contradistinction to the ordinary darker-coloured species."

—S. B. Rossouw.

Lydekker mentions never having seen female horns from Equatorial Africa of the long slender type of those upon which Gray founded the so-called *Rhinoceros oswelli*.

Mammæ 2 (ing.).

Horn Records.—Rowland Ward records 12 anterior horns that exceed 40 inches in length, 10 of these being South African.

The longest South African horns are presumably those of females.

The six longest South African specimens measure as follows:

- (1) 62½ in.—W. Gordon Cumming (recorded in the 7th ed., R.W., as 59 in.).
- (2) 56½ in.—British Museum.
- (3) 52½ in.—W. Gordon Cumming.
- (4) 51 in.—J. Duke.
- (5) 50¾ in.—W. N. McMillan (posterior horn 10 in.).
- (6) 44 in.—British Museum.

Schillings, the German Explorer, mentions a horn measuring no less than 81 in. (6 ft. 9 in.)—*cf.* Pitman ('A Game Warden among his Charges').

In the South African Museum there is a 'kerrie' or knobbed stick made from the front horn of a White Rhinoceros, the length of which, allowing for parts lost in carving, would have been about 61 in. Selous mentions two unusually fine South African horns which measured 54 and 52 in. respectively; and himself shot a cow with a 45 in. horn. His best bull (now in the British Museum) measures (anterior horn) 37¾ in., and (posterior horn) 17¾ in.—credited to be the finest pair of (Southern) bull horns in existence.

In the Kaffrarian Museum there are two anterior bull horns from Southern Rhodesia, measuring 35¼ and 29¾ in.—from specimens shot by A. Cross, who accompanied Selous for many years in Rhodesia.

The anterior and posterior horns of the mounted female (from Rhodesia) in the South African Museum measure 35½ and 7½ in. respectively; those of the Zululand female in the Transval Museum measure 28¾ and 5½ in.

The two longest North African horns (*C. s. cottoni*) recorded by Rowland Ward measure:

- (1) 41 in.—P. M. Dover—Mongalla (posterior horn 11 in.).
- (2) 40¼ in.—F. G. Poole—Bahr-el-Ghazal.

Pitman however, records a 45¾ in. horn from the Lado, and a 42½ in. horn from Uganda, both of which are stated to be those of bulls.

In the American Museum there is a mounted bull White Rhino from Uele Dist., Belgian Congo, with a 42 in. anterior horn and a 22½ in. posterior horn.

The record basal circumference for a White Rhino horn (Rowland Ward) is 29¾ in. (Loder).

Skull length, 33 in. (Roosevelt).

Weight.—3-4 tons.

Shoulder height.—6 ft. 6 in., to 6 ft. 9 in. (Coryndon).

6 ft. 6 in. to 6 ft. 8 in. (Harris).

6 ft. 6 in. (Bryden, Selous, S. Hamilton).

190 to 200 cm. (Wilhelm).

5 ft. 3 in., to 5 ft. 8 in. (bulls); 4 ft. 11½ in., to 5 ft. 3 in. (cows) (Roosevelt—*C. s. cottoni*).

6 ft. 1½ in. (a mounted female in the South African Museum).

A pair of White Rhinoceros shot by Vaughan-Kirby measured (bull)—(height), 5 ft. 10⅝ in. (girth), 115⅜ in.,¹ (cow)—(height), 5 ft. 9⅜ in. (girth) 112⅜ in.

The bull, mounted in the Natal Museum, now has a standing height of 6 ft., and the cow, in the Durban Museum, of 5 ft. 10 in. These were picked specimens, and estimated to be two or three inches above the average in height.

¹ Shoulder height of an Indian Rhinoceros (*R. unicornis*) 6 ft. 4¼ in., girth 119 in (Maharaja of Cooch Behar).

Quagga q. antiquorum

Field measurements of 11 out of 15 specimens collected from the Kaokoveld and the Okavango Region:

	H. & b.	Tail.	Hf.	Ear.	Locality.
(1) ♀	2460	515	555	170	Katijhuru (S. Kaokoveld). ¹
(2) ♂	2360	470	570	168	Otjitundua (C. Kaokoveld).
(3) ♂	2400	480	560	180	Otjitundua.
(4) ♀	2380	500	565	175	Otjitundua.
(5) ♀	2220	490	555	170	Otjitundua.
(6) ♂	2240	500	570	170	Tshimbaka (Cunene).
(7) ♂	2440	565	580	165	Otjimbundu (Cunene).
(8) ♂	2010	480	510	165	Otjimbundu.
(9) ♂	2220	510	610	162	Mbambi (Okavango).
(10) ♀	2170	530	592	160	Mbambi.
(11) ♀	2385	500	610	160	Mohango Drift (W. Caprivi).

Average length of *Bontequagga* skulls in the Kaffrarian Museum, 21–22 in. (S.W. Africa).

Diceros bicornis

Field Measurements:

	H & b.	Tail	Hf.	Ear.	
(1) ♂	13 ft. 4 in. ²	27 in.	—	—	(Kirby).
(2) ♂	13 ft. 1 in. ³	25 in.	—	—	(Kirby).
(3) ♂	12 ft.	24 in. (average)	—	—	(Kirby).
(4) ♀	10 ft.	24 in. (average)	—	—	(Kirby).
(5) ♂	12 ft. 1 in.	24 in.	—	—	(Jackson)
(6) ♂	10 ft. ⁴	24 in.	—	—	(Neumann).
(7) ♂	9 ft. ⁴	24 in.	—	—	(Neumann).
(8) ♂	12 ft. 3 in.	30 in.	17½ in.	9¼ in.	(Roosevelt).
(9) ♀	11 ft. 3 in.	26½ in.	17 in.	8½ in.	(Roosevelt).

Field measurements of a male specimen of *Diceros bicornis occidentalis* from Kaoko-Otavi, N. Kaokoveld (Kaffrarian Museum):

H. & b.	Tail.	Hf.	Ear.
2,780 mm.	520 mm.	430 mm.	215 mm. (Kaffrarian Museum).

¹ Shoulder height, 1,450 mm. (Standing height at the shoulder—during life—of the type of *Q. q. kaohensis*, 1,230 mm.—Zukowsky.)

² 'Between pegs,' 10 ft. 3 in.

³ 'Between pegs,' 10 ft. 1 in.

⁴ Neumann's measurements may be 'between pegs.'
(Roosevelt & Heller give the skull lengths of a bull and cow Black Rhinoceros as 23½ and 23 in. respectively.)

(The skull of the Kaffrarian Museum sp. of *D. b. occidentalis* measures 19¼ in., from tip of nasals to end of occipital crest.)

Ceratotherium simum

Field measurements.

	H. & b.	Tail.	Hf.	Ear.	
(1) ♀	13 ft. 1 in.	26 in.	—	—	S Rhodesia (mounted sp. in S.A. Museum—Sclater). ¹
(2) ♂	11 ft. 9 in.	29 in.	31 in.	11 in.	Lado Enclave, Roosevelt.
(3) ♀	11 ft. 3 in.	27 in.	—	—	Lado Enclave, Roosevelt.

Alcelaphus caama

Field measurements of 2 out of 7 specimens from Gobabis District and Ovamboland:

	H. & b.	Tail.	Hf.	Ear.	Shoulder.	Croup.	Locality.
(1) ♂	2060	500	585	195	1450	1320	Stampriet Gobabis Dist.).
(2) ♀	1860	410	—	195	—	—	Stampriet.

Alcelaphus lichtensteini

Field measurements:

The following are the recorded dimensions of a bull and a cow Lichtenstein's Hartebeest in inches by P. Rendall:

	H. & b.	Tail.	Ear.	Shoulder.
(1) ♂	91½	26¼	9½	52½
(2) ♀	87¾	26	9½	50¼

¹ The length (nose to root of tail) of a more recent Zululand White Rhino in the South African Museum is stated to be (or have been) 14 ft. 7 in.—although the height is (or was) only 5 ft. 8 in. It may be that the typical southern race averages somewhat larger than *C. s. cottoni* from Northern Africa.

Coryndon records two extreme lengths (nose to root of tail) of 16 ft. and 16 ft. respectively; Bryden records 16 ft.