KUNGL. SVENSKA VETENSKAPSAKADEMIENS HANDLINGAR. Band 48. N:o 5.

MAMMALS

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BY

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because it is evidently something analogous to the preponderant use of the right side of the head in Giraffes as set forth at another place in this memoir, and also to the right-handedness of man.

In the primeval forest of Kenia Elephants are to be found but whether of the same race or not is uncertain. These forest Elephants may belong to the Aberdare race (*E. a. peeli*). When passing through the forest region between Embu and Meru we saw tracks of Elephants several times, and on the way back we were so close to them that we heard them break branches etc. At an open place in the forest at an altitude of 2,500 m. the Elephants appeared to have a favourite resort between two small rivulets. There were spoors everywhere and at two different places around some water holes the probably alkaline earth had evidently been dug up by the Elephants with their tusks as the marks plainly showed. Close above this place rose a hill so steep that it was connected with difficulty for a man to ascend it, but the numerous Elephant tracks proved that these animals often passed up and down there. The »steps» in these tracks were often 80 to 100 cm. high above the next.

The Elephants ascend on Kenia to, and even above the bamboo region as the spoors indicate. At an altitude of 2,700 m. where the temperature at sunrise only was + 1° C. the Elephant spoors were numerous. These animals are thus not so susceptible to a low temperature as is generally believed. But when the rainy season sets in, I was told, that the Elephants descend to the shambas in the cultivated region. »They do not like the dripping from the trees.»

In the Kenia forest I saw in several places the ingeniously arranged pitfalls in which the Wandorobbos catch Elephants. They were dug in the paths of the animals and often with great cunning, between two big trees, in a curve of the path etc. to make it more difficult for the Elephants to avoid them. They were deep but so narrow that if an Elephant fell into such a pitfall he should be jammed in by his great weight so tightly between the walls that he could not move, and thus not be able to work his way out again.

Perissodactyla.

Rhinocerotidæ.

Rhinoceros (Diceros) bicornis Lin.

The Rhinoceroses were formerly common over great parts of British East Africa, but it is now exterminated, or nearly so, near all settled districts and roads along which there is any regular traffic, or where too often hunting parties are going in search of game. I saw, however, several on the acacia steppe south of Guaso Nyiri, and in the dry thornbush country north of this river they were found to be rather

numerous in certain localities as well as on the southern side of the river below Chanler Falls. In the dry country there numerous game paths lead to the river, and in the dust of these paths the spoors of Rhinoceroses were a regular feature. Probably many of these paths were just the products of the more or less regular walk of the Rhinos between their pasture-lands and the water. In day-time the Rhinoceroses are very seldom found near the river. As a rule they are met with at a distance of from 5 to 8 kilometres, perhaps more, from the water. Their chief food appeared to be a low scrub. They were found not only on the flat country but sometimes on the mountain slopes in the bush among rocks and boulders where one hardly could imagine that such a bulky and clumsy-looking animal would be able to find its way.

Here and there along the paths of these animals such places are seen where they are used to deposit their droppings and then scatter them. Such places are usually situated at a bush which as a rule has been broken and kicked to pieces, and a big hole is scooped up in the ground. It is sometimes stated in the literature that the scattering of the dung is done with the horn. Although I never have seen a Rhino at work it appears to me quite clear that at least most of it is done with the feet to judge from the deep furrows radiating from the hole and which exactly fit to the breadth of feet and in which even toe marks may be seen.

It is very difficult to explain how such a habit could have originated and become fixed, for it can impossibly be in any way useful to the animal now and thus be explained by natural selection. It might, however, be an inheritance.

The propagation of the Rhinoceros is, of course, slow, as usually is the case with such big animals, and it takes a long time before they reach full development. The fact that female Rhinoceroses often were seen in company with their not far from fullgrown young proves that several years pass between each period of gravidity, or parturition. On the other hand it is evident that the female Rhinoceroses in the districts visited do not suffer from barrenness because as a rule they were accompanied by a more or less grown up young. Sexual maturity is reached before the last molar has cut the gum as can be concluded from the fact that this tooth was not fully developed in a female which Mr. SJÖGREN shot south of Guaso Nyiri and which was followed by a good sized calf. On the other hand, a male Rhinoceros (Pl. VII, fig. 2) with only six cheek-teeth in use had comparatively very small testicles in which no ripe sperms were found, and it was thus not yet sexually mature. This animal measured from snout to vent in a straight line about 255 cm. (about 8 1/2 English feet) or 295 cm. along the dorsal line. Its exact age is difficult to tell but it was probably several years old. It had like all other Rhinoceroses observed at close quarters numerous scars and ulcers (conf. the fig.) along the flanks. If those are obtained when the animals fight inter se or not is impossible to say, but it is most probable because hardly any other animal would dare to attack them, and the skin is too hard and thick to be deeply scratched by the thornbush. The Rhinoceroses were found to be infested by ticks of the species *Hyalomma ægyptium* (L.),

Amblyomma hebræum (KOCH) and *Dermacentor rhinocerotis* (DE GEER).[1] In the ventricle were found a few larvæ of some *Oestridæ* but they were too young to be determined according to Prof. SJÖSTEDT.

The Rhinos in the Guaso Nyiri district had all, as far as could be observed, small horns, the front horn measured along the anterior curve in those shot only about 36—40 cm.

According to several observers the Black Rhinoceros of the Somali countries shall be smaller than those in other parts of Africa, and a subspecific name »*somaliensis*» was created in the year 1900 by Count J. POTOCKI. DRAKE-BROCKMAN in his book about »the Mammals of Somaliland»[2] says »It has been said that it [the Rhinoceros of Somaliland] is smaller than the East African variety, but this is possibly due to the poorness of its food supply during certain seasons of the year in Somaliland. The horns certainly seldom grow to any great length» — — — (l. c. p. 106). The Rhinoceroses north of Guaso Nyiri in the thornbush country live under analogous conditions and they were certainly poor. The ribs could be traced through the skin (Pl. VII fig. 2).

Quite recently LYDEKKER has compared two skulls of DRAKE-BROCKMAN's Rhinoceroses from Somaliland with a skull from »East Africa» and found[3] that the former »differ by the narrower form of the whole upper surface, both at the interparietal constriction and at the orbital expansion». The figures of the Somali skull at the side of the East African skull show a striking difference in breadth. Only two measurements of the breadth of these skulls are recorded, viz. the »breadth at orbits» and the »zygomatic width», in LYDEKKER's paper. For comparison the same measurements of two South African, two East African, and two skulls from Guaso Nyiri are recorded in the accompanying table of measurements. From this can be seen that LYDEKKER's East African skull must have been unusually broad as none of the 6 skulls now measured attain the same orbital breadth, nor zygomatic width.

	LYDEKKER's specimens		Guaso Nyiri		SJÖSTEDT's from Kilimanjaro	»East Afr.»	WAHLBERG's from "Caffraria"	SPARRMAN's from Capo
	Somali	East Afr.						
	cm.	cm	cm.	cm.	cm.	cm	cm.	cm.
Length of upper aspect	57,5	55,5	56,5	54,5	56,5	57	56	55,5
Breadth at orbits	23,0	27,5	23,5	21,7	24,3	26	25,5	22,3
Zygomatic width	29,5	35,6	32,3	31	32	33,4	32,3	34
Least width of skull at the postorbital constriction	—	—	11,8	11,4	11,8	12,2	11,3	11,7
Width of across anterior horn boss . .	—	—	13	11,6	13,3	14,5	13	13

LYDEKKER's East African skull is thus beyond the average in these respects and accordingly, as this table of measurements indicates, the differences between *somaliensis* and other Black Rhinoceroses are not so great as will appear from

[1] Conf. L. G. NEUMANN: Ixodides. Ark. f. Zoologi Bd. 7 n:o 24 p. 4 Uppsala 1912.
[2] London 1910.
[3] Proc. Zool. Soc. London 1911 p. 958—960.

his communication. Specimens with smaller orbital breadth than this *somaliensis* skull can evidently be found in different parts of Africa, and the zygomatic measurement is very variable.

The least width of the skulls at the postorbital constriction appears to be rather constant in the specimens measured by the present author, but unfortunately LYDEKKER has not given this measurement, nor that for the width across the anterior horn boss which latter is more variable in size. The exact condition of *somaliensis* in these two respects cannot be stated but the specimens from Guaso Nyiri do not appear to differ essentially from skulls from other parts af the continent. To judge from the present material there is thus no pronounced racial difference between the Rhinoceroses at Guaso Nyiri and those in East and South Africa.

There are, however, individual differences which appear very striking at the first look but prove to be less important when considered more closely. The breadth of the anterior end of the mandible is in South African specimens usually 5 to 5 ½ cm., and in the Guaso Nyiri skulls from 4 to nearly 5 cm. but in a skull from Kilimanjaro it is very broad, measuring 6,2 cm. and containing rudiments of four incisors. Such a thing has, however, only interest for the study of the individual variation but is then of importance.

It appears rather uncertain how long time this interesting remnant of a past fauna will be allowed to exist. The danger for extermination is the greater as the Rhinoceros is a slow breeder. It certainly has diminished rapidly in some districts, and it is deplorable that so many of these huge beasts are killed without reason. The Rhinoceroses have a bad reputation and this causes the death of many of their kind. »He is irritable, nervous, inquisitive, and churlish; unwary and wanting intelligence; unsympathetic as the dry, arid districts in which he lives», says F. VAUGHAN KIRBY in »The Great and small Game of Africa» (p. 37) about the Black Rhinoceros. With my little experience I cannot say anything against these attributes, but the three first of them he shares to some degree with not a few of them that speak ill about him, and, worse still, act accordingly.

It is much spoken of charging Rhinos, and it is, of course, an undeniable fact, as I have experienced myself, that some Rhinos do charge viciously. But it is by far the smallest number of them that are wicked. The greatest number flee at once when they get the wind of, or hear a man. Some may perhaps advance compelled by curiosity when they with their very bad eye-sight cannot make out what it is that has disturbed them. Others may, when they have been scared and rush away in the direction in which they happen to be headed, run so that they pass in proximity of man, and then it almost looks as if they intended to charge, although they are entirely innocent. Such incidents are, however, sometimes counted together with the real charges and the Rhinos are therefore by some people, who have witnessed real attacks, and by a number of nervous persons regarded to be much worse than they really are. Unfortunately some people also give vent to their hatred and shoot down the Rhinos in such a way that it must be termed wanton destruction and be most seriously condemned.

It is wonderful how often some people are »charged» by Rhinos, and in some cases it is no doubt a bona fide belief, and some people may perhaps have had worse luck with those creatures than others, or the Rhinos may be more fierce in some districts.

But on the other hand it is very easy to produce an effect which looks as if a Rhinoceros charged. A man approaches such an animal from its lee side and then he sends a native around to the windside. As soon as the Rhino perceives the taint it starts. If it runs up wind it charges the native, if in any other direction it charges somebody else!

Two Rhinoceroses are allowed on a license, and the charging ones are not counted. With the great number of sportsmen now visiting British East Africa two Rhinoceroses on each license is too much, and a not too small a fee ought to be paid for the killing of every charging Rhinoceros as well. I suspect that the number of such »bad brutes» would not be so great then as it is reported to be now. It may appear hard that one should be obliged to pay for the killing of a charging dangerous beast, but those people who visit East Africa solely for the purpose of shooting and bringing home »trophies» can no doubt afford to pay something for saving their lifes, if need be.

In settled districts and such with a lively traffic the Rhinoceroses may be a troublesome nuisance, especially if they are numerous. But there are vast stretches of land in British East Africa, as well dry steppe as arid thornbush country, which never can produce any kind of crops, and where at most nomadic tribes may be able to feed their flocks. There the Rhinoceroses do no harm, and there, at least, they may be allowed to remain in reasonable number.

Although my experience about the Rhinoceros of East Africa, naturally enough, is not very great I think it may be opportune to mention as examples the behaviour of some of the Rhinos observed.

The 4th of Febr. we were going with our safari from Luazomela to Itiolu river across the open steppe. The wind blew transversely across our path from right to left. A female Rhinoceros with her calf seen on our left at a long distance, more than a kilometre, started to run like mad with raised tail as soon as the taint from the safari reached her. The calf followed close after her. A little later the same day a Rhinoceros was observed asleep under an acacia about, or rather less than 100 metres from our path. The safari was ordered to pass silently, but the Rhinoceros heard something and rose. As its visual power was not strong enough to give any information about what was going on, and it could not smell anything against the wind it laid down again quietly since it had tried to stare at us for a while. Similar incidents of both kinds were repeated several times during the expedition. In the thornbush north of Guasy Nyiri one day the grown up calf fled first and the mother followed, since they had stared at us a while.

Another day in the same country I passed a Rhinoceros with a nearly fullgrown calf at a distance of about thirty metres under the wind, and they did not perceive anything. At another opportunity I had shot a big Baboon on the slopes of a

mountain in the thornbush country. After the report of the shot we heard a couple of Rhinoceroses snorting in the bushes close behind us, but we did not see them. As we were on march I wanted the Baboon skinned at once so that the boys should not need to carry the heavy body. My gunbearers drove then the Rhinoceroses away by throwing some stones at them so that they should not disturb the skinners.

When we were camping at the water-holes at Njoro I went out as usual in the morning the 21st of Febr. to collect zoological material and had shot some small birds when a porter came running to me and said something about a »faru» (Rhino) which was about to kill the »nyumbis» (mules) and threatened the camp. I returned speedily and saw a Rhinoceros most peacefully browsing close to our mules on the other side of the dry river-bed at which we had our camp. The boys were of course very excited and wanted me to shoot. As the Rhinoceros had only small horns I did not want to shoot it, hoping to get a better specimen for the collection at another opportunity. I told the boys that, but said that if they wanted me to stay at the camp and protect them I would wait there till the Rhinoceros had walked away. When the boys found that they could not entice me to shoot, the »faru» suddenly lost all its dangerous qualities, and two negroes at once ran across the dry river-bed and drove away the Rhinoceros by shouting and throwing sticks at him, and he trotted of through the bushes with full speed.

A comparatively long experience of a similar kind proved to me that at least the greatest number of these animals, if not all, were rather good-natured, but by and by I learned to know that not all had the same kind disposition. One day when we were marching from a water-place Thera in the thornbush to Guaso Nyiri I went about half an hour in front of the safari with my gunbearers and an askari as guide. We followed a game path, and the wind blew across from left to right. Suddenly we perceived a Rhinoceros lying under an acacia to the right of our path. We were thus not able to pass without his noticing us. We stopped then and my gunbearer, Kongoni, advanced cautiously to the left of the path. As soon as the Rhino got wind of Kongoni he jumped to his feet and with a »locomotive snort» (as VAUGHAN KIRBY says) he went for the boy with full speed. When the askari, who also had advanced a little an the left side of the path, saw this, he shot (and hit the ground several metres from the Rhino). The Rhino changed then direction about 45 degrees towards the askari. I took then a step to be clear of a bush and be ready to shoot. The Rhino saw this movement, changed again his direction about 45 degrees and came towards me, but a bullet in his neck at rather close quarters made him swerve off. This was plainly a very deliberate charge, and the interesting thing is that the Rhino changed direction twice when he saw a new adversary.

A few days later, an afternoon when I was returning to our camp at Guaso Nyiri below Chanler Falls we found a Rhino lying close to the game path which we were following. The thornbush was rather thick there, and it would have been troublesome to make a detour around him. I tried therefore to drive him off by shouting at him. He started to his feet with a snort and as we were near him

he saw us and charged. I had thus to shoot, and he dropped on his knees stone-dead for a 9,3 mm. mauser bullet between the shoulder and the neck.

Thus, of all Rhinoceroses I had the opportunity of seeing only two charged, and the notes above may prove that it is not by far the rule that these animals are so bad-tempered as their reputation makes them.

Equidæ.

Equus burchelli böhmi MATSCHIE.

MATSCHIE: Sitz.-ber. Ges. Naturf. Freunde Berlin 1892, p. 131.

(Equus burchelli grantii DE WINTON.

DE WINTON: Ann. & Mag. Nat. Hist. 1896, Ser. 6, Vol. XVII, p. 319.)

This Zebra is common on the plains around Nairobi where not too heavily decimated by the settlers. At a place called Punda Melia, south of Fort Hall, which just has received its name (which means »zebra») from the former abundance of Zebras there, I saw only a single such animal on our way north, and six when we returned. On the acacia steppe noth of Meru boma at Luazomela, Itiolu, and Lekiundu rivers the Zebras were numerous, and at the latter locality they were often found in mixed herds with the large Grévy's Zebra without apparent rivality. On the Athi plains they often are associated with Coke's Hartebeest and Gnu, at the northern acacia steppe with Oryx Antelopes.

North of Guaso Nyiri in the thornbush country I did not see any Zebras, but Mr. CUNNINGHAME told me that he had seen three one day. Although the Zebras occasionally cross this river — perhaps when scared by Lions, or if some other danger threatens them — it appears to constitute the northern limit of their distribution in this part of East Africa.

At a certain distance when the stripes are no longer conspicuous, a Zebra looks either very light grey almost white, or nearly black according to the different shade of light in which it stands. But a couple of the uppermost white stripes across the hind quarters shine much more brightly white than the others.

A considerable variation in the colour pattern of the Zebras of British East Africa has already been proved by J. A. ALLEN.[1] The same author has also stated the presence of shadow stripes in some specimens, even if they as a rule are absent. The difference between *E. b. grantii* DE WINTON and *E. b. böhmi* MATSCHIE appears thus to be very slight if any as already once before has been pointed out by the present writer,[2] and MATSCHIE's name is the older.

[1] Bull. American Mus. Nat. Hist. New York, Vol. XXVI, Art. XII, p. 160—165, figs 3—10.
[2] Mammals p. 32 in Wiss. Ergeb. d. Schwed. Zool. Exp. Kilimanjaro Meru von Y. SJÖSTEDT.

Fig. 1.

Fig. 2.

Fig. 3.

Cederquists Graf. A.-B., Stholm.