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OBSERVATIONS

ON THE

GEOLOGY AND ZOOLOGY

OF

ABYSSINIA,

MADE DURING THE PROGRESS OF THE BRITISH
EXPEDITION TO THAT COUNTRY IN 1867-68.

BY

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purpuroptera, *Chrysococcyx cupreus*, and a rutiline bird, which I subsequently found to be undescribed, my *R. fuscicaudata*, and in the evening I added to these *Palaeornis torquata*, also an addition to my collection.

Having provided my men with as many birds as they could possibly skin, we all started together the next afternoon to look for rhinoceroses. We rode across the undulating plain, cultivated in patches, and intersected with ravines filled with thick bush, to the river, along the banks of which there is a narrow belt of high forest, with dense underwood of bushes. I had seen nothing so luxuriant in Africa. So dense is the underwood that it is only possible to creep through the tangled labyrinth of roots and branches by the paths made by the rhinoceroses which haunt these thickets. These animals retire into the thickest parts during the heat of the day. In particular spots, generally amongst high reeds, they select a small space of ground, which they clear of bushes, and these spots are well known to the natives as "rhinoceros houses."

In such a house, in the centre of a broader strip of thicket than usual, the men who were with us reported that two rhinoceroses, an old one and her cub, were lying. The approved method of endeavouring to shoot these animals is by walking silently into their retreats, firing at them, and then taking refuge up a tree. This, however, requires a degree of agility in tree-climbing upon which we could not rely, and it is not only dangerous, but, according to all the accounts we

received, peculiarly unsuccessful, since we could never hear that a rhinoceros had been bagged by it. We accordingly posted ourselves at one end of the jungle, and told our men to shout and make noises at the other, but the rhinoceroses escaped across the river.

Immediately after this piece of ill-success, we discovered a herd of doe koodoo on the opposite bank. Riding across the stream, which was about knee-deep with a rather treacherous bottom, we proceeded to stalk the antelopes, again without success, a man having crossed the ground meantime and disturbed them. We, however, caught sight of them again, and Mockler shot a young doe. As we came up to the body two rhinoceroses, one a huge beast, the other about three parts grown, ran across the open about 150 yards from us, and disappeared in a broad ravine. After peering about for some time, a sharp-eyed Somali caught sight of the larger one standing in the jungle, and by making a circuit we came within 100 yards. Nearer approach was very difficult, and the bushes were so high that if we entered the broken ground, near the other side of which the animal stood, we should probably lose sight of her completely. Jesse and I took steady aim, and fired. With the most astonishing sound, a series of snorts like puffs from an enraged steam-engine, the brute, with its young one following, dashed into the bushes in front and came on towards us. The moment it left the spot where we had seen it, it vanished in the jungle, and only the snorting and crashing of the branches told of its rapid progress towards us, until it emerged just where we had been

standing. Meantime we had modestly retired behind a neighbouring bush, the rhinoceros continued its route, and we followed, one of the Bejuk chiefs who was with us running ahead. Presently he rushed back, a perfect picture of excitement and delight, dancing like a madman, beating his shield with his spear, and springing nearly his own height into the air; telling us, partly by words, mainly by pantomime, that the rhinoceros was running round and round in a circle and falling over. We soon came up with it: the monster lay dying on the ground, the young one stood by prodding the mother with its horns, and evidently trying to induce her to move on. Though very badly hit, the old one took several more bullets before it was dead; the smaller animal, after receiving one or two shots, rushed off at the most astonishing pace, and we saw it no more. An examination of the body next day showed that Jesse's bullet, a conical, had hit on the shoulder, turned forwards, and lodged in the neck. Mine, a round bullet, had hit behind the shoulder, made a clean hole through the centre of a rib, and entered the lungs close to the heart. Its not having glanced on the rib showed the advantage of a hardened round bullet over a conical. I had fired with a heavy breach-loading No. 12, with a charge of five drachms of the strongest coarse powder.

After following up the smaller rhinoceros for a short distance unsuccessfully, it became dusk, and, strapping the koodoo on a baggage-mule of Mockler's, we started homewards. Scarcely had we done so when two lions began roaring in some bushes close by. We went up to the

place, but it was too dusk to see anything. Scarcely had we crossed the river when another lion commenced, and we heard others on our way home. This was during our stay in the Anseba, a circumstance of nightly occurrence, yet in the daytime we could scarcely ever find the animals.

For two or three days Jesse and I were busily occupied in collecting and skinning. We drew lots for the spoils of the rhinoceros. Jesse won them, and with much labour preserved the skeleton, which is now in the British Museum, and has been determined to be that of the keitloa.

On the 16th Mr. Munzinger arrived, having ridden from Ailat in only three days. On the following morning Mockler and I rode with him to Keren, the principal village of the Bogos, about sixteen miles south-west of Wasentel. The road lies up the Anseba valley, the river being crossed about half-way. Although we had only had occasional showers, usually in the afternoon, heavy rain frequently fell near the source of the stream in Hamazen, and the water was constantly very muddy, and the river more or less flooded. After crossing some hilly ground, our route lay up the bed of the Dari, a tributary of the Anseba, now dry, and thence over undulating ground to Keren.

This was the largest village we had seen. A considerable proportion of the houses were the usual beehive-like mat huts, but there were also a number of much larger dwelling-places with walls of wattle, and thatched. The thatch, however, was not very good. A heavy thunder

and hail storm came on soon after we arrived; which penetrated through it, and we were obliged to take refuge in an inner room covered with mats,—a larger specimen, in fact, of the usual Bedouin beehive.

Keren lies at the foot of a fine range called Zeban, consisting of highly granitoid rock. All the metamorphics around are more highly crystalline than usual; and the hills, as usual, in consequence of the peculiar mode of weathering, appear to consist of gigantic rounded blocks piled upon each other.

We returned next day to Bejuk. Wald Michele, the ruler of Hamazen, had threatened to march upon the Bogos and "eat up" the country, because Kassai, the Prince of Tigré, had appointed a M. René, a Frenchman in his service, to receive the revenue instead of Wald Michele. Mr. Munzinger wrote to Wald Michele, and induced him to put off his raid, and to refer the matter in dispute to Kassai, as the superior ruler. This was an admirable instance of the influence which Mr. Munzinger has acquired amongst these people; an influence which, it is scarcely necessary to say, was of the very greatest importance during the progress of the expedition, and to which indeed no small portion of its success was due.¹

Although Wald Michele was perfectly friendly to us, we judged that in the event of disturbances it would be

¹ I believe it is not too much to say that the march of the army upon Magdala would have been delayed by at least a month but for Mr. Munzinger's assistance. It will scarcely be credited that the only recompense made to that gentleman for his services has been the abolition of the consulate at Massowa, and his consequent dismissal from the British service, with a formal letter of thanks from the British Consul in Egypt.

wiser to keep a little out of the way, and we consequently made two short marches down the Anseba valley, the first to Waliko, the second to a place called Hegyargillé, near Maregas. The country continued much the same.

The fauna of the valley is very rich and varied. It comprises many animals which appear to be restricted to what may be termed the sub-tropical zone, and which are neither met with on the coast nor in the highlands. I obtained a magnificent collection of skins, both of birds and mammals. The following will serve to give a general idea of the principal animals found.

Monkeys were not very common, and the baboon (*Cynocephalus hamadryas*) less than usual. *Cercopithecus griseo-viridis* was occasionally seen in the trees near the river. I saw no bats, and wild cats were rare. Leopards were less common than in the rocky valleys to the east. Lions abounded, as already remarked. Hyænas (*H. crocuta*) and jackals (*Canis mesomelas*) were the commonest carnivora.

Amongst the pachydermata, rhinoceroses have already been mentioned. The white African rhinoceros (*R. simus*) does not occur in Abyssinia or the Nile valley, so far as is known. Hyraces are not common. The wild hog (*Phacocharus*) was occasionally met with, but it is less common than near the coast. The ruminants of the Anseba valley are all antelopes. The koodoo is found in the open valley, the klipspringer on the rocky hills around; while the little Beni Israel (*Neotragus saltarius*) keeps to the bushes. Another bush antelope

stances in which an Indian pig would certainly have shown fight.

The flesh is savoury, but dry and hard, even in comparatively young animals.

Ælian's wart-hog is considered by Dr. Gray, the last writer on the subject, identical with the South African *Phacochærus æthiopicus*, Erxl. (*Sus africanus*, Gm.); and unquestionably Dr. Gray gives very strong arguments in favour of his views. My reasons for dissenting are: first, that Dr. Gray, from the nature of the specimens before him, was compelled to rely entirely upon cranial and osteological characters, and that I believe there are external differences in the two forms; secondly, that all the specimens in the British Museum appear to be from South or West Africa and not from Abyssinia; and it is most probable that the two races are representative.

The external differences are far from unimportant, as I judge from a fine adult South African specimen in the Gardens of the Zoological Society, and from the drawing in Major Cornwallis Harris's "Game Animals of South Africa." The ears in the South African species have tufts of long hair; this peculiarity is wanting in *P. Æliani*: and the form of the warty protuberances on the face is quite different in the two species,—in the males, at all events; in the females the warts are much smaller, and the upper ones are deficient. The colour of *P. æthiopicus* also appears much more rufous in general.

So far as regards the dental characters, all the evi-

dence which I can add is in favour of the distinction. I brought away with me three skulls of large males. One is that of a very old animal with enormous tusks, the upper pair being no less than eleven inches long each outside the jaw, measured along and outside of the curve. In all three skulls both upper and lower incisors are permanent. In old specimens of *P. æthiopicus* both are generally wanting.¹

13. *Rhinoceros keitloa*, A. Smith (*R. bicornis*, L. var.).

Bruce, Travels, vol. v. p. 65.

Smith, Illust. S. Afr., Zool.-Mamm. pl. 1.

Rhinaster keitloa, Gray, P. Z. S. 1867, p. 1025.

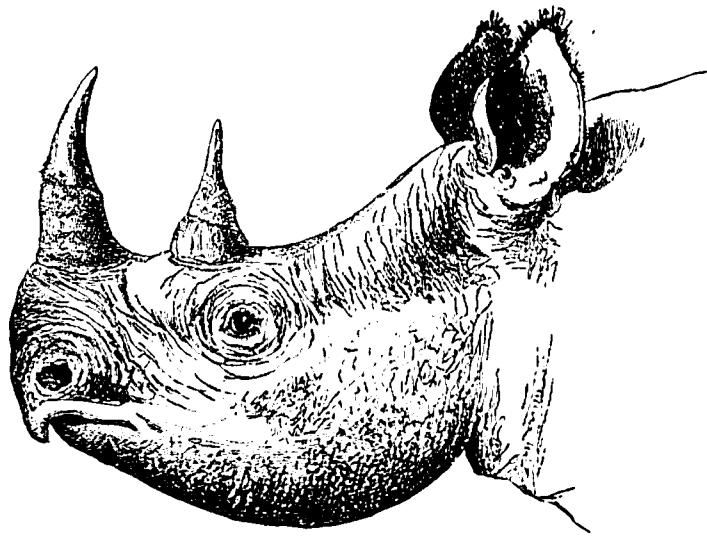
Rhinoceroses appear to be confined to the lower elevations in Abyssinia; they do not ascend above about 5,000 feet elevation in the northern portion of the country, and they are entirely wanting on the high plateau. I only met with them on the banks of the Anseba, where they were tolerably common. All belonged to the black type—the white African rhinoceros does not appear to have been met with north of the equator.

Although the rhinoceros of Abyssinia and Nubia was described long ago by Bruce,² very few specimens have ever reached Europe. The difficulty of carrying the spoils of so large an animal is very great. Mr. Jesse brought away the complete skeleton of an adult female,

¹ Vide also Selater, Proc. Zool. Soc. 1869, p. 276, pl. xx.

² Bruce's figure, however, represents an Indian (one-horned) Rhinoceros, with an additional horn.

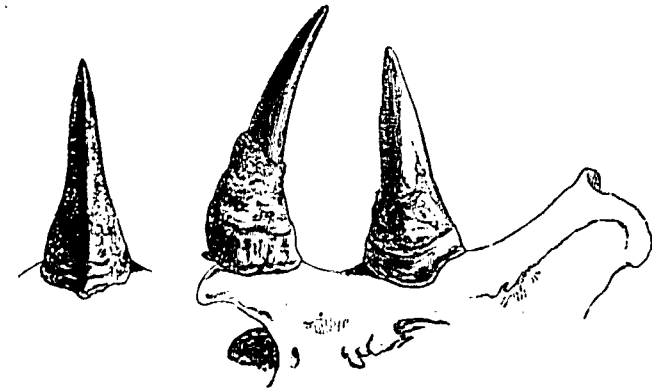
which is now in the British Museum. I only obtained the head and skull of a younger female, nearly adult, now deposited in the same collection. The animal is by no means easy to kill, and these two were the only ones bagged by our party. There is now a young male from Nubia in the Gardens of the Zoological Society.¹



The accompanying figures represent the head and horns of the younger female killed on the Anseba, the horns with a portion of the skull of the adult female, and the back view of the hinder horn of the latter, all drawn to a scale of one-tenth the natural size. A comparison of the last with the typical specimen of *R. keitloa* in the British Museum, or with the figure

¹ Cf. Sclater, *Student and Intell. Obs.* 1869, p. 328.

in Dr. Smith's "Illustrations of the Zoology of South Africa," will show the very close resemblance in form. In the typical specimen the horns are of equal length; in that from Abyssinia the front horn is 16 in. long, the hinder $12\frac{3}{4}$ in. The first is nearly circular in section throughout, being a little compressed above; the latter is much compressed, more sharply edged behind than in front. Half-way up it measures $2\frac{1}{2}$ in. from front to back, and $1\frac{1}{2}$ in. across.



The horns in the younger specimen measure—the anterior 12 in. along the curve in front, or 11 in. measured in a direct line from the centre of the base to the tip, while the hinder horn is $7\frac{3}{4}$ in. in length. The first is slightly compressed, having an oval section; the two diameters half-way up being 1.8 in. and 1.4 in. The hinder horn tapers suddenly below, and more gradually above; it is rather less compressed than the

front one; the diameters, three inches from the tip, being 1.2 in. and 1 in.

In the young male in the Zoological Gardens, the horns are comparatively short, especially the hindmost, larger at the base, blunt, and nearly circular in section.

How much of the variation in the three different animals is due to age and sex, it is impossible to say without further information and additional specimens. It is quite possible that the horns may be variable in length, and in the extent to which they are compressed, and yet that *R. keitloa* may be perfectly distinct from *R. bicornis*.

In both the animals killed by our party, the elongated process of the upper lip was well developed, as it is also in the Zoological Society's specimen. The neck was rather long, and there was a distinct appearance of a hump on the shoulder, just as represented in Dr. Smith's figure. This was peculiarly conspicuous in the larger animal after death, as it lay upon its belly, with its legs doubled beneath, a position taken by both animals in dying. Immediately on returning to India after leaving Abyssinia, and referring to Dr. Smith's plates, I was struck by the great resemblance of his figure of *R. keitloa*, in the characters of general form as well as of the horns, to the Abyssinian animal, and I was glad to find that Dr. Gray, from an examination of the skull brought home by Mr. Jesse, arrived independently at the same conclusion as to the specific relations (*Ann. and Mag. Nat. Hist.* 1869, p. 201).

The rhinoceros of the Anseba inhabits the dense thickets on the bank of the stream, which are intersected in all directions by the paths made by these animals. In the densest parts, where roots and stems render the jungle almost impervious, there are places known by the inhabitants as rhinoceros-houses. The stems and branches have generally been broken away or pushed back, so as to leave a clear space about 15 ft. or 20 ft. in diameter, at the bottom of which the ground has been worn into a hollow by the trampling and rolling of the animals in wet weather. These houses are used as retreats during the heat of the day. On two or three occasions we disturbed a rhinoceros from one of these, and he rushed off with much noise and loud snorts through the bushes. So far as we could learn from our observations, these animals enter the thick jungle early in the morning and rest until one or two o'clock in the day; then they leave their thickets and go out to feed, usually remaining, however, amongst high bushes. At the time of the year in which we visited the country rain generally set in in the afternoon, and, if it did not rain, the sky was overcast; in the clear weather the rhinoceroses are said never to appear before evening. They are great browsers, feeding chiefly on the young shoots and branches of acacia and other trees, or on fruits; so far as I could see, they do not generally eat grass.

Their movements are very quick, their usual pace being a smart trot, and the numerous tracks show that they move about a good deal. The natives declare that

it is impossible to escape from them even on horseback (I doubt this), but they are easily eluded by turning, as they are not quick of sight, and, like most mammalia, they never look for enemies in trees; consequently a man only two or three feet from the ground will remain unnoticed by them if he keeps quiet. They are said to be extremely savage, and unquestionably the first one killed by us charged most viciously. The same is related of the black rhinoceros by all African sportsmen. I cannot help thinking, however, that their savage disposition has been rather exaggerated. When on the Anseba, we heard numerous accounts of people having been killed by lions, panthers, and elephants; but Mr. Münzinger told me that, during his long experience in the country, he never knew of any one having been killed by a rhinoceros, although he himself had had a narrow escape when charged by an animal he had wounded.

The majority of the animals seen by our party were in pairs, an old female and a nearly full-grown cub. On one occasion Captain Mockler saw four together.

The only sound we heard them make was the snort of alarm or rage, so frequently referred to by Sir Samuel Baker in his description of the rhinoceroses met with by him on the Nile Tributaries in Western Abyssinia. It is a most peculiar noise, resembling that made by a locomotive more than any sound made by an animal with which I am acquainted.

The following are the dimensions of the larger rhino-

ceros killed, that of which the skeleton is in the British Museum:—

Length of head from snout to between the ears	ft. in.
2	8
„ neck and body from between ears to inser- tion of tail	7 1½
„ tail	1 9½
Total length from nose to end of tail, measured along the curve of the back	11 7
Length of body, measured along side from shoulder to rump	6 9
Height at shoulder	4 8½

I am indebted to Mr. Jesse for these measurements. I had, unfortunately, no tape with me when we killed the animal, and Mr. Jesse took them from the carcass next morning.

14. *Hyrax abyssinicus*, Hemp. and Ehr.

H. habessinicus, Hemp. and Ehr., Symb. Phys., t. ii., smaller specimen in lower figure (nec *Euhyrax abyssinicus*, Gray, Ann. and Mag. Nat. Hist. vol. i. p. 47).

The synonymy of the North African Hyraces is enveloped in the direst confusion. Dr. Gray recently attempted to clear this up in a paper published in the *Annals and Magazine of Natural History* for 1868, Ser. 4, vol. i. p. 35, and subsequently reprinted in the British Museum Catalogue of "Carnivorous, &c., Mammalia," p. 279; but in consequence of not having had access to the types described by previous authors, he has in some instances mistaken other forms for them. The excessive variation to which the common Abyssinian