

mere vaguely defined blotches, comparatively far apart from each other. These differences were well seen on a comparison of the figure given by Harris of the Southern Giraffe<sup>1</sup> with those given by Rüppell<sup>2</sup> and Brehm<sup>3</sup> of the Northern one.

Prof. Sundevall had already noticed the difference in the general colour of the two animals, and had given to the Northern form the varietal name of *Camelopardalis giraffa*, var. *æthiopica*<sup>4</sup>.

A communication was read from Dr. R. W. Shufeldt, C.M.Z.S., giving particulars of the methods used in preparing certain Invertebrates, which were adopted by the experts at the U.S. National Museum, in the case of specimens sent to Chicago for exhibition at the World's Columbian Exposition. This communication was illustrated by photographs of the objects in question. After the preparation of finished moulds of these objects, gelatine casts were made from the moulds, the gelatine being made of the following composition:—

Best Irish Glue . . . . .	4 oz.
Gelatine (photographers') . . . .	2 „
Glycerine . . . . .	4 „
Boiled Linseed-oil . . . . .	$\frac{1}{4}$ „

The gelatine casts were then coloured to resemble the objects in life.

The following papers were read:—

1. On the Mammals of Nyasaland: third Contribution.

By OLDFIELD THOMAS, F.Z.S.

[Received February 13, 1894.]

The present paper contains an account of the third and fourth collections of Mammals made and presented to the National Museum by Mr. H. H. Johnston, C.B., Consul-General for British Central Africa, with the help of his able assistant, Mr. Alexander Whyte, F.Z.S. Papers on the two previous collections have already been published<sup>5</sup>.

The series now described bears out the prophecy I ventured to make in 1892, that as Mr. Whyte's knowledge of the locality increased he would be able to obtain the rarer and more local species, and that among these there would certainly be some

<sup>1</sup> 'Wild Animals of S. Africa,' pl. xi. (1840).

<sup>2</sup> Atlas Reise N. Afr. pl. viii. (1826).

<sup>3</sup> 'Thierleben,' iii. p. 188 (1880).

<sup>4</sup> "Pecora," K. Vet.-Ak. Handl. 1844, p. 175.

<sup>5</sup> P. Z. S. 1892, p. 546; and 1893, p. 500.

novelties. For although there are not a very large number of species altogether represented in the present collection, yet several are new to the locality, one is a rediscovered species described thirty years ago, and two are new to science.

The Mammal-fauna is therefore evidently far from worked out, and Messrs. Johnston and Whyte should be encouraged to continue their explorations until, after the receipt of five or six more similar collections, we may perhaps be in a position to say that our knowledge of the Mammals of the district approaches completion.

1. *CERCOPITHECUS ALBIGULARIS*, Sykes.

a. Ad. sk. ♂. Fort Lister, Milanji, 3500 ft. 16/7/93.

b. Ad. sk. ♀. Milanji Plateau, 6000 ft. 26/4/93.

For the determination of these two Monkeys I am indebted to Mr. Sclater, who has been recently making a study of this group, and who has kindly furnished me with the following note respecting them:—

“The male is much larger, and shows no rufous on the rump and arms. The smaller female has these parts strongly tinged with rufous. This is probably a sexual distinction, as it was no doubt on a similar specimen that *C. erythrarchus*, Peters (which Dr. Matschie has lately pronounced to be = *C. albigularis*, cf. Sitz.-Ber. nat. Freunde Berl. 1893, p. 215), was based. The female specimen agrees well with the figure of *C. erythrarchus* in the ‘Reise nach Mossambique,’ and with a female specimen formerly living in the Zoological Society’s Menagerie.”

2. *OTOGALE KIRKI*, Gray.

a. Ad. sk. Blantyre. 2/93.

b-d. 3 do. Shiré Highlands. 12/92.

3. *GALAGO MOHOLI*, A. Sm.

a. Ad. al. ♀. Zomba.

4. *EPOMOPHORUS CRYPTURUS*, Pet.

a. Ad. al. ♀. Zomba.

Forearm 78 mm.

I entirely agree with Prof. Du Bocage<sup>1</sup> in considering that *E. crypturus* of Peters is not synonymous with *E. gambianus*, as stated by Dobson, but is a valid species intermediate between *E. macrocephalus* and *E. minor*. At the time of Dobson’s Catalogue there was not a specimen of it in the Museum, while *E. gambianus* was represented by two examples from the Zambesi, so that he naturally supposed Peters to have got hold of the same form, especially as the latter’s very imperfect description of the palate-ridges applies perfectly to those of *E. gambianus*.

Sundevall’s *Pteropus wahlbergi* from Natal appears, by the dimensions given, to be really *E. gambianus*, but *E. crypturus* also occurs

<sup>1</sup> J. Sci. Lisb. (2) i. p. 3 (1889).

there, as is shown by a specimen from that country presented to the Museum by Capt. Shelley in 1881.

5. RHINOLOPHUS HILDEBRANDTI, Pet.

a. Ad. al. ♂. Zomba.

Forearm 65 mm. ; ear, length 36 ; nose-leaf  $25 \times 13.5$ .

This fine Bat I had at first supposed to be new, owing to the fact that Peters had only re-softened skins to describe, and these scarcely showed its most remarkable characteristics, namely the great size of the ears and nose-leaf, and the development of a distinct crenulate supplementary leaflet outside the horseshoe. Nor did its describer observe that it is entirely without the minute intermediate lower premolar which most of the species possess, but which is also absent in *R. aethiops*. The British Museum, however, contains one of Hildebrandt's typical specimens, and a comparison with this proves the identity of the Nyasa example with it. The discovery of *R. hildebrandti* in Nyasaland effects a great extension of its range, as it was originally described from Taita, E. Africa.

6. RHINOLOPHUS LANDERI, Mart. (?).

a. Ad. al. Zomba. 1/93.

This specimen differs from typical *R. landeri*, and equally from Peters's *R. lobatus*<sup>1</sup>, probably synonymous with it, in the much greater breadth of the horizontal portion of the nose-leaf, which entirely covers the muzzle. As, however, a specimen quite agreeing with the true *R. landeri* was obtained on the Shiré by Kirk and Livingstone (specimen *c* of Dobson's Catalogue), I think it possible that the difference above noted may be purely an individual one, and not indicative of any local distinction. Further specimens will, however, be necessary before this point can be properly cleared up.

7. RHINOLOPHUS CAPENSIS, Licht.

a. Ad. al. ♂. Zomba. 1/93.

8. HIPPOSIDERUS CAFFER, Sund.

a. Ad. al. ♀. Zomba. 1/93.

9. VESPERUS MEGALURUS, Temm.

a. Ad. al. Zomba. 1/93.

10. VESPERUGO NANUS, Pet.

a. Ad. al. Zomba. 1/93.

<sup>1</sup> Peters, 'Reise n. Mossamb.' Säug. p. 41 (1852). All reference to this species was accidentally omitted from Dobson's Catalogue, but in his supplementary report of 1880 (Rept. Brit. Assoc. 1880, p. 10) it is included among the Ethiopian species closely allied to and scarcely separable from *R. ferrum-equinum*, as is also the true *R. landeri*. Whatever may be the ultimate fate of the other forms here thrown together by Dobson, there can, I think, be little doubt as to the essential identity of *R. lobatus* with *R. landeri*.

## 11. PETRODROMUS TETRADACTYLUS, Pet.

*a.* Ad. sk. ♂. Zomba. 1/6/93.

## 12. FELIS SERVAL.

*a, b.* Imm. sks. ♂ ♀. Fort Johnston. 2/93.

## 13. HYÆNA CROCUTA, Erxl.

*a.* Ad. ♂ skin and skull. Zomba. Sept. 15, 1893.

The following are the dimensions of the skull:—Basal length 233 mm.; extreme length 286; zygomatic breadth 179.

14. RHYNCHOGALE<sup>1</sup> MELLERI, Gray.

*Rhinogale melleri*, Gray, P. Z. S. 1864, p. 575; Thomas, P. Z. S. 1882, pl. iii.

*a, b.* Ad. sks. ♂ ♀. Residency Garden, Zomba. 4/93.

*c.* Yg. al. Ditto.

“Wild fruits are always found inside the stomach of this Mongoose.”—A. W.

The discovery of this fine Mongoose in Nyasaland is of considerable interest for two reasons. Firstly, its locality now becomes known with certainty, whereas hitherto it has been only conjectured<sup>2</sup> to occur on the Zambesi, a supposition that now proves to have been well-founded. Secondly and chiefly, owing to the fact that the original, and hitherto unique, specimen presented the remarkable number of five premolars on each side above, further specimens were urgently needed to show whether or not this was the normal number in the species. The importance of this point is exceedingly great, for no other known mammal has more than four premolars, and the exception presented by *Rhynchogale* has puzzled myself and other writers on the subject<sup>3</sup>. Believing as I do that four is and always has been the maximum number of premolars normally present, at least since middle Mesozoic times, it is something of a relief to find that the one known exception to this rule now disappears, as the perfect skull of specimen *a*<sup>4</sup> has simply the normal number of four premolars, and we may consequently assume that the type was abnormal in its possession of five.

The occasional abnormal development of five premolars is well known in Carnivores, notably in dogs, and is, I believe, generally due to the fission into two of one or other of the normal set of four. I quite fail to see, as Mr. Bateson would have us do<sup>5</sup>, that such cases are any argument against a belief in the individual homologies of teeth, and are not explainable by the simple process, discovered and described by himself, of the fission of normal teeth.

<sup>1</sup> Nom. nov. = *Rhinogale*, Gray, P. Z. S. 1864, p. 575; nec Gloger, Handb. Naturg. pp. xxix and 75 (1842).

<sup>2</sup> P. Z. S. 1882, p. 86.

<sup>3</sup> Cf. Phil. Trans. vol. 178, Biol. p. 456, 1887 (footnote).

<sup>4</sup> Specimen *b* is so old that the teeth are all worn down or broken out, while specimen *c* is too young to show any teeth at all.

<sup>5</sup> P. Z. S. 1892, pp. 102 *et seqq.*

In the instance before us, it is practically certain that the simple and attractive explanation, often put forward in such cases, that a milk premolar has been retained, instead of being shed in the usual way, is not applicable. For although there is no marked difference in size either between the most anterior premolar of the type and that of specimen *a*, or between the third of the type and the second of the same normal specimen, so that the tooth between them in the type would seem unlikely to be the product of the fission of either  $p^1$  or  $p^2$ , yet the  $mp^2$  of other *Herpestinae* is in form entirely unlike the styliform extra tooth under discussion, and  $mp^1$  has as yet never been certainly shown to be present in any Carnivore.

Mr. Whyte's observation on the food of *R. melleri* is of great interest, as its fruit-eating habits may perhaps account for the peculiar structure and wear of the molars. In all the three specimens before me the posterior molars appear to be more worn than the anterior, as though an unusual amount of chewing had fallen to their share; but it must be admitted that this appearance may be deceptive, and that the explanation may be that  $m^3$  is naturally so much flatter than usual that it appears to be worn flat almost at once.

The foetal or new-born specimen *c*, preserved in spirit, shows not the slightest trace of a mesial naked line below the muzzle, and therefore lends weight to Dr. Gray's opinion as to the value of this character in dividing the genera of *Herpestinae*.

15. *CROSSARCHUS FASCIATUS*, Desm.

- a.* Ad. sk. ♀. Zomba. 1/93.
- b.* Yg. sk. Zomba. 1/93.
- c.* Yg. sk. Mpimbi, Upper Shiré.

16. *LUTRA MACULICOLLIS*, Licht.

- a.* Ad. sk. ♀. Fort Johnston, Upper Shiré. 11/92.

This specimen belonged to the collection worked out in May 1893, but was accidentally omitted from my previous paper. The species is a rare one, and this exact record of its occurrence is therefore of value.

17. *SCIURUS PALLIATUS*, Pet.

- a, b.* Ad. sks. ♂ ♀. Milanji Plateau. 13 & 15/4/93.

18. *SCIURUS MUTABILIS*, Pet.

- a-i.* Four adult and five young skins. Zomba. 12/92 and 1/93.

These midsummer specimens are of the greatest interest, as illustrating a little further the series of seasonal changes occurring in this remarkable species. The adult specimens are halfway through a change of fur, two of them having fresh grizzled-grey hairs on the anterior halves of their bodies and on their tails, while their posterior halves are clothed with ragged rufous or

almost straw-coloured fur; the other two are not quite so far advanced. Laying them beside the skins previously received it appears, although this must be for the present a merely tentative explanation, that the grey fur characteristic of October skins gradually bleaches under the influence of the summer sun, until its black rings become first brown and then rufous, this change being quite independent of the shedding and replacement of the fur itself. At the same time there is a change in the paler rings between white and yellow, but in which direction and at what particular season the series before me does not conclusively show, chiefly because, although marked with the month of capture, the exact days have not been noted, so that there is often a little uncertainty as to their exact succession. Coincidentally with this bleaching of the dark rings the true change of fur occurs, the fur first falling off on the head, then on the shoulders and tail, and remaining on the rump until in January it is, as already noted, nearly straw-coloured, with rufous subterminal and yellowish terminal rings. The bleaching of the fur from black to rufous during life may seem almost impossible, but that it really occurs is shown by the darker rings of the tail-hairs, which in October are all deep glossy black, but in November those near the bases of the hairs, where they are not exposed to the sun, are still nearly or quite black, while the terminal ones are brownish red.

The young specimens, all apparently of about the same age, introduce a further element of complexity into the question, for while four of them (Dec. and Jan.) are in a rufous stage, the fifth (December) is grizzled grey, exactly like the grizzled grey parents killed in October. I can make no suggestion for the elucidation of the mystery, but I would suggest, to any one having the opportunity, the collection of a mother and her whole litter of young, the skins to be marked with their exact date, and with the fact of their belonging to one another.

I may venture to hope that further collections will contain more specimens of this very remarkable species, so that I may later have the pleasure of giving a complete account of its changes all the year round.

The fourth collection, made from May to August 1893, contains, unfortunately, no specimens of *S. mutabilis*.

19. *MUS DOLICHURUS*, Smuts.

a. Ad. al. ♀. Zomba. 12/92.

b. Imm. al. Zomba. 12/92.

The following are the measurements of the well-preserved adult specimen:—Head and body 97 mm.; tail 155; hind foot, without claws, 22; ear from notch 15.5.

Mammæ 1 - 2 = 6.

20. *MUS MODESTUS*, Wagn.

a. Ad. al. Zomba. 1/93.

## 21. ISOMYS DORSALIS, A. Sm.

a. Ad. sk. Zomba. 2/93.

## 22. CRICETOMYS GAMBIANUS, Waterh.

a. Ad. sk. ♂. Zomba.

b. Ad. sk. Zomba. 27/4/93.

## 23. LEPUS WHYTEI, sp. n.

a. Ad. sk. ♂. Mpimbi, Upper Shiré. 4/93.

b. Ad. sk. ♀. Palombi R., Shirwa Plain. 15/8/93. *Type.*

c. Ad. sk. ♀. Zomba. 19/4/93.

Size and general colour above nearly as in *L. capensis*, but the back is more uniformly grizzled and less mottled. Fur decidedly harsher than in that species. Forehead with a white spot. Ears comparatively short; their external band brown all along, with a whitish margin; their extreme tips only black. Nape bright rufous. Sides slightly more rufous than back, but not nearly so much as in *L. capensis*. Chin white. Chest rufous fawn, as are also the upper surfaces of the hind feet. External surface of fore limb, and line down hind leg, richer rufous. Tail rather short, black, more or less mixed with rufous fawn above, white below.

Skull with a short muzzle, very broad proximally, narrow inter-orbital region, and narrow posterior narial fossa. Incisors broad, their groove close to their inner edge.

Dimensions of the type, an adult skin, female:—

Head and body 468 mm.; tail without hairs (c.) 47; ear, from notch, 88; hind foot, without claws, 95.

Skull: basal length 68; basilar length 65.5; greatest breadth 42.5; nasals, greatest length 37, greatest breadth 18; inter-orbital breadth 16.2; intertemporal breadth 12.7; diastema 21.5; anterior palatine foramina, length 20.5, combined breadth at surface 9.2; width (antero-posterior) of palatal bridge 8.6; least breadth of posterior narial fossa 5.

This Hare, which I have much pleasure in naming after Mr. Alexander Whyte, the able seconder of Mr. Johnston's efforts to investigate the fauna of Nyasa, is readily distinguishable from *L. capensis* by its harsher fur, rufous nape, shorter ears, feet, and tail, and somewhat different coloration. It is by no means improbable that the specimens from Angola which have been referred to "*L. ochropus*, Wagn.," really belong to *L. whytei*, but this point can only be determined later. The typical *L. ochropus* was described from the Cape itself, and, in agreement with Waterhouse, I can see no possible reason why it should not be looked upon as strictly synonymous with *L. capensis*.

## 24. PROCAVIA JOHNSTONI, sp. n.

a. Ad. sk. ♀. Fort Lister, 3500 ft. 20/7/93. *Type.*

b. Imm. sk. Fort Milanji. 27/7/93.

c. Yg. sk. Milanji Plain, 4000 ft. 27/10/91. (*P. capensis* of P. Z. S. 1892, p. 553.)

“Found among the rocks at base of cliffs.”—A. W.

Allied to *P. capensis*, and therefore belonging to *Procavia* in the narrowest sense; no relationship to “*Heterohyrax*” or “*Dendrohyrax*.”<sup>1</sup>

Size large. Fur comparatively harsh, at least in the type, killed in early summer. General colour of body brown grizzled with white, the grizzling far coarser than in *P. capensis*. Underfur smoky brown. Crown of head deep reddish brown, without white grizzling, much as in some of the red-headed examples of *P. abyssinica*. Cheeks grizzled grey, blacker just beneath the eye. Ears of medium length, thinly clothed internally with whitish, externally with black hairs. A prominent blotch behind and below the ears deep black, this colour running in the type vertically down the sides of the neck. Chiu black; throat and chest grizzled grey; belly deep dirty yellow. In the younger specimens the throat and chest are, like the belly, yellow. Arms and legs like back, but the upper surfaces of the hands and feet are deep black.

Dorsal spot small, roughly oval, uniform black.

Skull equalling or even exceeding in size that of *P. shoana*, of which only three skulls, all in Stage VIII., of those measured in 1892, have a greater basal length than the present typical specimen, which is only in Stage VII. Diastema rather short, but longer than in *P. capensis* both above and below. Interparietal sutures persistent. Interparietal bone, as seen in specimen *c*, Stage II., before its form has been altered by the growth of the masseter, pentagonal, its longest side the posterior one, which is directly transverse, and nearly double the postero-lateral ones.

*Teeth.* Molars and premolars very large and heavy, exceeding those of any other species; no doubt, however, as in *P. capensis*, they will prove to be variable in this respect.  $P^1$  sub-quadrangular, similar in shape to  $p^2$ , far larger and stouter than in *P. capensis*.  $M^1$  of type no less than 8.5 mm. in breadth, thus exceeding by 0.4 mm. the largest molar (of *P. shoana*) measured in 1892; its height too much reduced by wear to be worth measuring. Lower  $p^1$  better developed and apparently more persistent than in *P. capensis*, its horizontal length in the type 3.3 mm.

Measurements of the *type*, in skin, ♀ :—

Head and body 560 mm.; [hind foot of specimen *b*, 53].

Skull (Stage VII.): basal length 90.5, greatest breadth 53; nasals, length (median) 23, breadth posteriorly 22.5; interorbital breadth 23, intertemporal breadth 26 [interparietal of specimen *c*, length 8.5, breadth 9.5]; palate, length 50; diastema, above 11, below 4; length of upper molar series 44, of lower molar series 45; height of lower jaw 50.

This fine new Dassy<sup>2</sup>, which, as being the most striking new

<sup>1</sup> See “On the Species of the Hyracoidea,” P. Z. S. 1892, pp. 50–76.

<sup>2</sup> This word, which is the common name given by the English Cape Colonists to *Procavia capensis*, may be conveniently used for any member of the genus.

Mammal discovered during Mr. Johnston's exploration of the Nyasa Fauna, I have named in his honour, is remarkable as being the only member of the genus distinguished by any colour-markings other than those of the dorsal spot. The prominent black ear-mark is in fact quite unique in the group, while its reddish-brown crown, although sometimes present in *P. abyssinica*, will readily distinguish it from its nearest ally, *P. capensis*, in which the crown is finely grizzled like the back. The unusual massiveness of the grinding-teeth will also readily separate *P. johnstoni* from all other forms.

The occurrence of this peculiar but clearly representative species between the ranges of *P. capensis* and *P. shoana* tends to confirm their distinctness from each other, on which I had thrown some doubt when writing in 1892.

Since my monograph of the genus was prepared, two species of *Procavia* have been described by Dr. Matschie<sup>1</sup>, but both belong to the *Dendrohyrax* group, and have therefore nothing to do with *P. johnstoni*.

25. *PROCAVIA BRUCEI*, Gray.

*a, b.* Ad. & imm. sks. ♀. Mpimbi, Upper Shiré. 4/93.

*c* Yg. sk. Fort Lister, 3500 ft. 25/7/93.

These specimens probably represent *Hyrax mossambicus*, Peters. The youngest of them has already got its interparietal sutures closed.

The basal lengths of the three skulls are :—

*a.* (Stage VIII.), 79 mm. ; *b.* (Stage V.), 71 ; *c.* (Stage III.), 63.

The ears of these examples are more prominently white than is usual in *P. brucei*, and their bellies and feet are also particularly white, characters in which they somewhat resemble the closely allied *P. bocagei*, and it is probable that when more specimens of the latter are obtained the two forms will be found to grade into one another.

In looking at the fine set of Dassies from Nyasa now sent, three of *P. johnstoni* and three of *P. brucei*, all found more or less together, one cannot fail to be struck by the peculiar method in which evolution seems to have been going on in the group. Not only do they afford a striking instance of the remark made previously<sup>2</sup> as to the constant occurrence together of one species of the hypsodont and one species of the brachyodont group, the competition between members of the two groups apparently not being severe enough to prevent their living together, but also, the practicability of their living together being once proved, they seem then to have tried to become as different from each other in their superficial characteristics as possible. Thus, while the hypsodont *P. johnstoni* is distinguished from its allies of the same group by its dark head, black ear-markings, dirty yellow belly, and black

<sup>1</sup> S.-B. nat. Fr. Berl. 1892, p. 110, and 1893, p. 112.

<sup>2</sup> P. Z. S. 1892, p. 57.

digits, *P. brucei* in Nyasa is distinguished from *P. brucei* elsewhere, as just mentioned, by its *white* ears, pure *white* belly, and *white* digits, each species when meeting its congener having, as it were, emphasized its own distinguishing characters in order to be unlike the other. For *P. brucei*, wherever found, is already characterized by its pale colour generally, whitish head, and white or pale yellow dorsal spots, while *P. capensis*, of which *P. johnstoni* may be looked upon as a modification, has a generally dark colour and a black dorsal spot.

Thus there seems to be between the two a sort of mutual "repulsion" in their characters, the exact converse of the better known "mimicry." Its object would very probably be that of furnishing the individuals of each species with "recognition marks" by which to know comrades from rivals.

26. RHINOCEROS BICORNIS, L.

a. Horns. Shiré Highlands.

27. PHACOCHÆRUS ÆTHIOPICUS, Pall.

a, b. Ad. skulls. ♂ ♀. Shiré Highlands.

28. BUBALIS LICHTENSTEINI, Pet.

a. Ad. sk. and skull. Shiré Highlands.

b. Skull. Shiré Highlands.

29. OREAS CANNA, H. Sm.

a, b. 2 ad. sks. ♀. Shiré Highlands.

30. STREPSICEROS KUDU, Gray.

a. Ad. skull. ♂. Shiré Highlands.

31. TRAGELAPHUS SCRIPTUS, Pall.

a. Ad. skull. Shiré Highlands.

32. KOBUS ELLIPSIPRYMNUS, Og.

a, b. 2 frontlets and horns. Shiré Highlands.

33. ÆPYCEROS MELAMPUS, Licht.

a, b. 2 skulls. Shiré Highlands.

34. OREOTRAGUS SALTATOR, Bodd.

a. Ad. sk. ♂. Fort Lister, Milanji, 3600 ft. 17/7/93.

"Found in pairs at the base of the high cliffs among rocks, and also on the higher ridges. Also on Mt. Zomba."—A. W.

35. MANIS TEMMINCKI, Smuts.

a. Ad. sk. Zomba.

P.S., March 17th, 1894.—Specimens representing the following species have arrived since the above was written, and may conveniently be added to the list here :—

36. RHYNCHOCYON CIRNEL, Pet.

a. Ad. sk. ♂. Zomba. 1/11/93.

37. CANIS MESOMELAS, Schr.

a. Ad. sk. ♂. Palombi R., Shirwa Plain. 11/10/93.

38. NANOTRAGUS SCOPARIUS (Schr.).

a, b. Ad. sks. Shirwa Plain. 10/93.

39. CERVICAPRA ARUNDINUM (Bodd.).

a. Ad. sk. ♂. Palombi R. 6/10/93.

2. On a Collection of Land-Shells from the Samui Islands,  
Gulf of Siam. By O. F. VON MOELLENDORFF, Ph.D.<sup>1</sup>

[Received December 4, 1893.]

(Plate XVI.)

Mr. C. Roebelen, a well-known collector of orchids, to whom I am indebted for a great number of interesting shells from various parts of Eastern Asia, visited, in 1888 and 1892, the small group of islands south of Bangkok, named by the Siamese Ko-Samui, and situated near the coast of the Malay Peninsula at its narrowest part. The group, from which, so far as I know, no Land-Shells were hitherto known, consists of several small islands, the largest of which is called Samui. The rock seems to be calcareous throughout: at least one small island, called Kwangtong, is, according to Mr. Roebelen, one mass of apparently madreporic limestone.

As might have been expected from their geographical position, the fauna of the Samui group is essentially Malaccan, several species being common to the adjoining mainland, and most of the forms peculiar to the group having their nearest relatives amongst the species of Siam, Tenasserim, and Perak.

Fam. STREPTAXIDÆ.

1. STREPTAXIS SIAMENSIS, Pfr.

*Streptaxis siamensis*, Pfr. Mon. Hel. v. p. 449; Tryon, Man. Pulm. i. p. 79, t. xv. fig. 73.

Subsp. nov. DEPRESSA.—*Differt a typo spira magis depressa, anfractu ultimo magis distorto, penultimo subtus glabrato, dente*

<sup>1</sup> Communicated by Mr. G. B. SOWERBY, F.Z.S.



Thomas, Oldfield. 1894. "1. On the Mammals of Nyasaland: third Contribution." *Proceedings of the Zoological Society of London* 1894, 136–146.

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