

immense quantity of foliage. The male generally selects his mate during the night, and copulation takes place at some time between 8 a.m. and 3 p.m. the following day. The sexes are united for at least two hours.

I have not been able to ascertain so far the exact number of eggs produced by one individual, but think that from eighty-five to a hundred is the probable number.

Summary.—The Phylliums are dependent upon a very warm and moist atmosphere, and are therefore more or less confined to the islands in the tropical zone: in all stages they are very similar, both in colour and habits, to various plant-structures. Post-embryonic development is slow and takes place by a gradual increase in size of the individual, adults only differing externally from the young larvæ in the possession of fully developed tegmina and wings. The sexual dimorphism is pronounced, the females being large and foliaceous, whilst the males are much smaller and although flat are not characterised by such a leaf-like appearance as the females.

In conclusion, I wish to express my indebtedness to Professor Hickson and Mr. Hewitt for their kind assistance.

REFERENCES.

1749. RÜSEL v. ROSENHOF, A. J. Insekten Belustigung. II. Theil: Orthopt. pl. 17, figs. 4, 5.
1767. LINNÆUS, CAROLUS. Systema Naturæ. Ed. xii, tom. i. pt. ii. 1787-1815. STOLL, CASPAR.—Representation exactement colorée d'après nature des Spectres ou Phasmes, des Mantes, &c. Amsterdam.
1839. SERVILLE, AUDINET. Histoire naturelle des Insectes Orthoptères. Paris.
1843. GRAY, GEORGE R. Description of several species of the Genus *Phyllium*. Zoologist, vol. i. pp. 117-123.
1856. MURRAY, ANDREW. "Notice of the Leaf-Insect lately bred in the Roy. Botan. Garden of Edinburgh." Edinb. New Philos. Journ. vol. iii. pp. 96-111.
1859. WESTWOOD, J. O. Catalogue of the Orthopterous Insects in the Collection of the British Museum—Phasmidæ. Part I. London.
1871. JOLY, DR. N. "Contribution à l'histoire naturelle et à l'anatomie de la Mouche-Feuille des îles Seychelles." Mém. Acad. Sci. Toulouse (7) tom. iii. pp. 1-28, 3 pls.
1883. DE BORRE. Compt. Rend. Soc. Ent. Belgique, vol. xxvii. p. cxliii.
1887. BRONGNIART, CHARLES. "Note sur le développement de la Mouche-Feuille de Java (*Ph. siccifolium*)." Ann. Soc. Ent. France (6) tom. vii. Bull. pp. lxxxiv-lxxxvii.
1890. HENNEGUY, L. F. "Note sur la structure de l'enveloppe de l'œuf des Phyllies." Bull. Soc. Philom. Paris (8) vol. ii. p. 18.

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1894. BECQUEREL, H., ET BRONGNIART, CH. "La matière verte chez les Phyllies." Compt. Rend. Acad. Sci. Paris. vol. cxviii. pp. 1299-1303.
1898. SHARP, DAVID. Account of the Phasmidæ, with Notes on the Eggs. Willey. Zoolog. Results, Cambridge. pp. 75-94, pls. vii.-ix.
1903. MORTON, W. "Notes sur l'élevage des Phyllies." Bull. Soc. Vaudoise, xxxix. pp. 401-408, pl.
1904. KIRBY, W. F. Synonymic Catalogue of Orthoptera. British Museum. Vol. i.
1907. ST. QUINTIN, W. H. "Leaf-Insects in Captivity." Entomologist, vol. xl. pp. 73-75, and 147, pl. iv.
1908. ST. QUINTIN, W. H. "Notes on the Life-history of the Leaf-Insect." Naturalist, no. 618, pp. 235-238, pls. xxv., xxvi.

EXPLANATION OF PLATE XXVIII.

Phyllium crurifolium.

The figures represent the adult male and female of the natural size, and were photographed from living examples.

1. Female imago.
2. Male imago.

2. The Mammals of Matabeleland. By E. C. CHUBB, F.Z.S.,
Acting Curator of the Rhodesia Museum.

[Received December 29, 1908.]

The Rhodesia Museum has acquired during the past two years sufficient material to give a good idea of the mammalian fauna of the Western Province of Southern Rhodesia, and it is upon this collection that the present paper is based. For the sake of completeness, however, I have included the mounted examples of big game that were in the Museum prior to this period, and also a few species known to occur in the country, though up to the present unrepresented in the Museum.

The only previous paper dealing with the mammals of this area is that of De Winton*, being a list of a collection made by Selous at Essexvale. The species therein recorded are also incorporated in this list.

Two interesting Bats, *Rhinolophus empusa* and *Clotis percivali*, are now recorded for the first time from South Africa south of the Zambezi, hitherto being known only from the type localities, Nyasaland and British East Africa respectively.

The probability of the different geological formations supporting distinct vertebrate faunas was pointed out to me some time ago by my former colleague, Mr. F. P. Mennell, and indeed this seems to be borne out in a remarkable way by at least one group among

* P. Z. S. 1896, p. 798.

the mammals, viz. the Elephant-Shrews, one of which, *Elephantulus rupestris myurus*, occurs wherever there is an outcrop of granite, while the other, *Nasilio brachyphynchus*, is found only on the schists. Although separated generically on dental characters, these two shrews are very closely allied in other respects and are of very similar habits. They are never found living together, however, for whereas the latter is common at Bulawayo on the schist, yet on the granite only two miles west of the town, and also at Helenvale about 15 miles north, and the Matopos some 40 miles south, it is replaced by *Elephantulus rupestris myurus*.

As a general rule the mammals here get their new annual coats at the beginning of the rainy season, about October or November, and the contrast between the old faded coat and the new one is very marked in jackals killed in, say, August and November.

The country slopes down from a line running north-east through Bulawayo, at an altitude of about 4500 feet above the sea, to the Zambezi and Limpopo Rivers on either side, which are about 2000 feet and 1500 feet respectively.

I must express my indebtedness to Mr. Oldfield Thomas, Dr. Knud Andersen, and Mr. R. C. Wroughton, who have been good enough to compare and identify a number of specimens for me.

The native names are those of the Matabele, an offshoot of the great Zulu nation, who trekked up from the south about seventy years ago. The letters "c" and "q" in these names represent clicks. "c" is made by pressing the tongue against the front upper teeth and quickly withdrawing it, as *isaace*. It is much the same sound as the expression of vexation "tut." "q" is made by curling the tip of the tongue upwards against the roof of the mouth and quickly withdrawing it, as *iqaga*. This click sounds like the "pop" of a cork when extracted from a bottle.

1. CERCOPITHECUS PYGERYTHRUS Cuv.

There are two flat skins, without skulls, of this Monkey in the collection. One was obtained near Inyati and the other in the Matopo Hills, where the species is fairly common.

Native name: *Inkau*.

2. PAPIO sp.

♂. 17 Oct., 1907. Matopos.

♀. 6 Sept., 1907. "

Native names: *Indwangu* and *Imfene*.

3. GALAGO MOSSAMBICUS Pet.

♂. 9 May, 1908. Bulawayo.

♂. 3 Aug., 1908. "

♂. 19 March, 1908. Gambo's, Manzumnyama River.

Nocturnal. It lives in a thorn-tree (*Acacia horrida*), and sleeps during the day in the hollow trunk or in a roughly

constructed nest of grass and twigs in a fork among the branches. Its food consists chiefly of insects, which it catches with its hands, but the gum of the tree on which it lives is also relished. This it takes in its hands and licks.

Its eyes are a rich dark red or mahogany colour, with a round pupil.

Native names: *Ugwintu* and *Umpugunyoni*.

4. RHINOLOPHUS DARLINGI K. And.

♂ ♀. Mazeppa Mine, Gwanda. In al.

Native name for all Bats: *Uluwawe*.

5. RHINOLOPHUS AUGUR ZAMBESIENSIS K. And.

♂ ♀ ♀. 5 April, 1907. Bulawayo.

♂ ♀ ♀. 9 April, 1908. "

3 ♂, ♀. Mazeppa Mine, Gwanda. In al.

Lives in caves in granite kopjes and also in mines.

6. RHINOLOPHUS EMPUSA K. And.

♂. Mazeppa Mine, Gwanda. In al.

This is interesting as being the second known individual example of the species, and also the first record of its occurrence south of the Zambezi. It was described on a specimen from Zomba, Nyasaland*.

7. RHINOLOPHUS HILDEBRANDTI Pet.

♂ ♀. 22 Sept., 1907. Malute Reef, Pandangwe, Gwanda.

4 ♂, 5 ♀. Mazeppa Mine, Gwanda. In al.

Lives in mines.

8. HIPPOSIDERUS CAFFER Sund.

♀. 12 Oct., 1907. Mazeppa Mine, Gwanda.

2 ♂, 4 ♀. Mazeppa Mine, Gwanda. In al.

9. CLEOTIS PERCIVALI Thos.

♀ imm. Mazeppa Mine, Gwanda. In al.

♂. 2 ♀. 18 Aug., 1908. Mazeppa Mine, Gwanda. In al.

10. NYCTERIS CAPENSIS Smith.

♂. 12 June, 1907. Bulawayo.

♂, 3 ♀. 15 June, 1907. Bulawayo.

♂, 5 ♀. Sept., 1907. Mazeppa Mine, Gwanda. In al.

Four out of the five females in alcohol are pregnant.

11. VESPERTILIO MINUTUS Temm.

♂. 25 June, 1908. Bulawayo.

♂. 5 July, 1908. "

3 ♂, 3 ♀. July, 1908. Bulawayo. In al.

* Ann. Mag. N. H. (7) xiv, p. 378, 1904.

75. STREPSICEROS STREPSICEROS Pall.

♂ ♀. Near Mangwe.
Native name: *Imbalabala*.

76. TAUROTRAGUS ORYX Pall.

♂ ♀. Aug., 1907. Kana River (skeletons).
Native name: *Impofu*.

77. BUBALUS CAFFER Sparrm.

The Buffalo is found in Northern Matabeleland, and I know of two males being shot there in October 1908.
Native name: *Inyati*.

78. GIRAFFA CAPENSIS Less.

♀. Near Mangwe.
Native name: *Intudhla*.

79. HIPPOPOTAMUS AMPHIBIUS Lind.

There are many hippos still in the country, and some were shot at Belingwe this year.
Native name: *Imvubu*.

80. POTAMOCHERUS CHEROPOTAMUS Ill.

♂. July 1908. Matopos.
Native name: *Inyulugunda*.

81. PHACOCHERUS ETHIOPICUS Pall.

♂. Oct. 1907. Khami R.
Fairly common all over the country.
Native name: *Inyulubi*.

82. EQUUS BURCHELLI CHAPMANI Layard.

2. Near Mangwe.
Native name: *Idube*.

83. DICEROS BICORNIS Gmel.

♂. Jan., 1907. Gwelo.
Native name: *Unkombo*.

84. PROCAVIA CAPENSIS Pall.

♂ imm. 13 Sept. 1907. Siringa.
♂ ♀. 23 Sept., 1907. Pandangwe Kopjes, Gwanda.
2. 20 Feb., 1908. Between Lochard Siding and Inyati.

♂. 17 April, 1908. Near World's View, Matopos.

♂. 19 April, 1908. Mt. Silozi, Matopos.

One of the skins from between Lochard Siding and Inyati has a large white patch on the top of the head.

Native name: *Imbila*.

85. PROCAVIA BRUCEI Gray.

♂. 24 April, 1908. Kahlele's, Matopos.

Trapped in tree by natives.

Native name: *Imbila*.

86. ELEPHAS AFRICANUS Blum.

The Elephant is to be found in Northern Matabeleland, and I saw fresh spoor of a herd on the Kana River in November, 1907.

Native names: *Indhlovu* and *Inkubu*.

87. MANIS TEMMINCKI Smuts.

♂. 22 April, 1907. Wankies.

Native name: *Inkaka*.

88. ORYCTEROPUS AFER Pall.

♂. Aug., 1907. Mapisa's, near Figtree.

♀. 24 Oct., 1908. Shiloh.

Native names: *Isambane* and *Iwombela*.

3. Report on Deaths which occurred in the Zoological Gardens during 1908. By H. G. PLIMMER, F.L.S., F.Z.S., Pathologist to the Society.

[Received February 1, 1909.]

On January 1, 1908, the number of animals in the Zoological Gardens was 3190 and during the year there were 2418 new arrivals, making a total for the year of 5608. 1737 animals have died during the year, that is roughly 31 per cent., but if from this number we subtract 769 animals which did not live for six months after their arrival in the Gardens—that is, those which had not got used to their new environment—the percentage of deaths is reduced to 17 per cent., which is probably a much fairer number to take.

Of those which have died, 1089 have been examined, and in 41 of these no cause of death could be found. Of the remainder 129 died from injuries of various sorts, or were lost, or not sent for examination, and 30 died from exhaustion due probably to depressed vitality from cold or darkness, or from inability to get or to take food.