

the Roebuck (*Cervus capreolus*) in Palestine," Professor Newton observed:—

"I write to make a slight correction of a statement published in the last part of the Society's 'Proceedings' (P. Z. S. 1876, p. 421). The remains of the Roe-Deer obtained on Mount Carmel were sent to the Museum of the University of Cambridge by the late Mr. C. F. Tyrwhitt-Drake, and not by Dr. Conder (as might be inferred from the Canon's expression); while the species was determined by Mr. J. W. Clark and Sir Victor Brooke, not by me. The remains, I may add, consisted of a nearly perfect skeleton and a damaged skin of a buck."

The following papers were read:—

1. Description of a new Species of Indian Snake of the Genus *Platyplectrurus* from the Wynad. By Lieut.-Col. BEDDOME, C.M.Z.S.

[Received September 26, 1876.]

PLATYPLECTRURUS HEWSTONI, sp. nov.

Brownish black above, each scale with an elongated white blotch on each side towards its posterior portion; belly white, with here and there irregular brown blotches; scales in fifteen rows—abdominals 123 and bifid, subcaudals five pairs (female); tail smooth, laterally compressed, ending in a horny smooth scale with a single point; snout rounded, nasals forming a suture behind the rostral; supraorbital shield present; eye small, in a large shield, pupil round; no postocular; vertical six-sided; a large temporal shield between the occipitals and the fourth labial; no median groove.

Hab. Manantoddy, in the Wynad, elevation 2700 feet (discovered by Dr. Hewston).

2. A Monograph of the Group *Molossi*.
By G. E. DOBSON, M.A., M.B., F.L.S., &c.

[Received October 20, 1876.]

The group *Molossi* was formed by me for the reception of three genera of Emballonuridæ—*Molossus*, *Nyctinomus*, and *Cheiromeles**, which agree together in the possession of certain well-marked natural characters which at the same time distinguish them from all other genera of this family. These genera, especially *Molossus* and *Nyctinomus*, or sections of them, have received several different names,

* I omit *Mormopterus*, Ptrs., formerly included by me (Ann. & Mag. Nat. Hist. ser. 4, vol. xvi. p. 349, 1875) in this group as a distinct genus, as I have lately discovered a species quite intermediate between the single representative of *Mormopterus* and the species of *Nyctinomus*. The group *Molossi* corresponds to Prof. Peters's family *Molossi* (Monatsb. Akad. Berl. 1865, p. 258).

each of which, without regard to priority, has met with favour from different zoologists, scarcely any two appearing to agree in adopting the same term; so that the same species is described not infrequently under three or four different generic titles in the works of almost contemporaneous observers. This has, no doubt, been due in a great measure to the original very imperfect definitions of these genera, and also to the want of any trustworthy arrangement of the large number of new species subsequently described.

The first satisfactory attempt to arrange the species scientifically in a systematic form, and to determine their correct synonymy, was made by Prof. Peters, who published, in 1865, in a footnote to his paper on the Brazilian species of Bats described by Spix*, a short list of the genera, subgenera, and typical species of this group, with descriptions of a few new species, and subsequently, in the same journal, gave the results of his examination of the typical specimens from which Geoffroy's and Wagner's original descriptions were taken. Finding, however, that not half the species of *Molossi* now known are included in Prof. Peters's list, in which also no descriptions are given, and that much remained to be done before any thing approaching a correct list of the species and their synonymy could be made out, I was induced to give the subject my special attention; and the following monograph of the species is the result of my examination of a large number of specimens (including most of the types) preserved in the British Museum, in the museums at Leyden, Berlin, and Paris, and in the Indian Museum, Calcutta, as well as in several smaller collections.

The *Molossi* may be defined as Bats of the family Emballonuridæ with short legs and well developed fibulæ, with broad strong feet (whereof the first toe or the first and fifth are much thicker than the others) furnished with long, curved, prehensile hairs; with a thick fleshy tail produced far beyond the posterior margin of the interfemoral membrane; with flat broad heads, and obtuse, obliquely truncated muzzles terminated by the projecting margins of the nostrils; with generally large and broad, often united ears, and a short, sometimes minute, tragus; with a single pair of well developed upper incisors converging inwards and forwards.

In all the species the upper lip is very thick, and often deeply furrowed by vertical wrinkles, evidence of its great expansibility. The wings are very narrow, and the middle finger very long, its metacarpal bone in most species slightly exceeding the total length of the last finger. The first phalanx of the middle finger is short, less than half the length of the metacarpal bone, on the dorsal surface of which it is folded forwards in repose. The interfemoral membrane sheathes the base of the tail, and is movable at the will of the animal backwards or forwards upon it, thus increasing or diminishing its surface.

The great length and narrowness of the wings indicate rapid flight; and the power possessed by these Bats of varying the extent of surface of the interfemoral membrane must confer upon them

* Monatsb. Akad. Berlin, 1865, p. 573.

great dexterity in quickly changing the direction of their flight, as when obliged to double in pursuing their swiftly flying insect prey; while the extremely expansible lips evidently aid them especially in capturing during rapid flight and in maintaining their hold on the large round-bodied Coleoptera. Of all Bats the *Molossi* appear especially suited by their peculiar conformation for capturing the most rapidly flying insects, which, no doubt, form the greater portion of their food. Their large and very strong acutely tubercular teeth would enable them to crush with ease the hard armour of the larger Coleoptera.

Synopsis of the Genera of Molossi.

- a. First toe much larger and thicker than the other toes and separable from them; ears quite separate.
 - a'. Premaxillary bones united; upper incisors very strong, close together in front..... 1. *Cheiromeles*, p. 704.
- b. First and fifth toes much thicker than the other toes; ears united or close together by their inner margins.
 - b'. Premaxillary bones united; upper incisors close together in front 2. *Molossus*, p. 705.
- c'. Premaxillary bones separate or united by cartilage only; upper incisors separate in front 3. *Nyctinomus*, p. 716.

The genus *Cheiromeles* is represented by a single species only, which, as I have previously remarked*, appears to be more closely allied to *Molossus*, which is restricted to America, than to *Nyctinomus*, of which several species inhabit the same countries with it.

The genera *Molossus* and *Nyctinomus* are very closely allied, some species, as *Molossus glaucinus*, Wagner, and *M. bonariensis*, Peters, forming the connecting links between them†. Nevertheless I retain these genera distinct, as they are convenient for grouping the species, and partly correspond to their geographical distribution, the species of *Molossus* being confined to America, while those of *Nyctinomus* are found in both hemispheres.

These genera have been divided into several subgenera, which depend on slight differences in dentition and in the form of the ear-coch and tragus. But so many perfectly intermediate forms exist that it is impossible to subdivide *Molossus* and *Nyctinomus*, which, indeed, as I have remarked above, may come to be regarded hereafter as subgenera only. Thus *M. (Promops) longimanus* resembles *M. rufus* (the representative of the subgenus *Molossus*) closely in the form of the tragus, and in the obtuse not obliquely truncated muzzle; and *M. (Promops) nasutus*, relegated to the subgenus *Promops* on account of its dentition, in all other respects is much more closely allied to *M. rufus*, with which it agrees in the peculiar form of the antitragus and tragus, and even in the distribution of the fur; while *M. rufus*, which differs from all other species in dentition, shows its close affinity to the representatives of the sub-

* Monograph of the Asiatic Chiroptera, p. 177.

† Should the discovery of species even more intermediate than these render it necessary at any future time to unite the genera *Molossus* and *Nyctinomus*, the former name, which has priority, must be used for the single genus.

genus *Myopterus* in the perfectly similar form of its antitragus, and in the shape of its muzzle.

The subgenus *Mormopterus* is distinguished from *Nyctinomus* by the absence of the first minute upper premolars, and by the distinctly separate ears; but *N. norfolcensis*, Gray, is quite intermediate, agreeing with *Nyctinomus* in dentition, and in other respects with *Mormopterus*; and the discovery of *N. albiventer*, Dobson (described further on), adds another intermediate form*.

Genus CHEIROMELES.

Cheiromeles, Horsfield, Zool. Researches in Java, 1824; Temminck, Monogr. Mamm. ii. p. 345; Dobson, Monogr. Asiatic Chiroptera, p. 177, 1876.

Ears separate, as in *Taphozous*; extremity of the muzzle projecting considerably beyond the lower jaw; lips smooth, not grooved by vertical wrinkles; first toe much larger than the others, and separable from them.

Dentition.—Inc. $\frac{2}{2}$, C. $\frac{1-1}{1-1}$, Pm. $\frac{1-1}{2-2}$, M. $\frac{3-3}{3-3}$.

Premaxillary bones well developed, conjoined, supporting two strong incisors.

CHEIROMELES TORQUATUS.

Cheiromeles torquatus, Horsfield, *l. c.*

Dysopes cheiropus, Temm. *l. c.* i. p. 218, pl. 17.

Cheiromeles caudatus, Temm. *l. c.* ii. p. 348, pl. 66.

Ears shorter than the head, triangular, with narrowly rounded tips; the inner margin of the ear-conch papillate along upper half as in some species of *Taphozous*; antitragus distinct, rounded; tragus very small, the inner margin not developed, the outer with a small projection near the base. Muzzle long, obliquely truncated,

* The following is a synopsis of the characters of these subgenera:—

Synopsis of Subgenera of Molossi.

Gen. MOLOSSUS.

a. Ears more or less united.

a'. Premolars $\frac{2-2}{2-2}$; upper incisors with diverging summits, and with their broad bases close to the canines *Promops*, Gervais.

b'. Premolars $\frac{1-1}{2-2}$; upper incisors parallel by their inner margins, their bases close to the canines ... *Molossus* (Geoffr.), Peters.

b. Ears distinctly separate; upper incisors with diverging summits, their bases removed from the canines by a diastema *Myopterus*, Geoffr.

Gen. NYCTINOMUS.

a. Ears very close or united together; upper lip deeply grooved by vertical wrinkles; premolars $\frac{2-2}{2-2}$ *Nyctinomus* (Geoffr.), Peters.

b. Ears distinctly separate; upper lip slightly wrinkled; premolars $\frac{1-1}{2-2}$ *Mormopterus*, Peters.

the extremity projecting very considerably beyond the lower jaw. An enormous gular sac extends half round the neck beneath. Into this sac the oily secretion of glands situated between the internal origins of the pectoral muscles is discharged, in males by a series of small pores collected in two circular slightly elevated patches, in females by a single large orifice.

First toe very thick, thinly covered with long curved hairs on the outer side; this toe is separated from the others like a thumb, and is probably opposable to them. Wing-membrane from the middle of the tibia, and from the sides of the back near the spine. A deep axillary pouch is formed, in both male and female, by an extension of a fold of skin, derived from the thick integument covering the breast and sides of the body, to the inferior surface of the humerus, and, longitudinally, to the femur. In the anterior part of this pouch, on the side of the body, behind the axilla, the mamma is placed.

Tail very thick and long, projecting more than half its length beyond the short interfemoral membrane.

Integument very thick and almost quite naked, with strong plications along lines of flexure and extension; the back is quite naked; but a collar of very short thinly spread hairs nearly surrounds the neck.

Upper incisors strong, placed close together, their extremities converging inwards; the single upper premolar large and tricuspidate; first lower premolar minute, wedged in in the space between the canine and second premolar, which are close together; the last upper molar less than half the size of the second molar.

Length: head and body 5''·3; tail 2''·6; head 1''·8; ear 1''·2, tragus 0''·15; forearm 3''·1; thumb 0''·8; second finger 7''; third finger 5''·6; fourth finger 3''·1; tibia 1''·4; foot and claws 1''·05.

Hab. Malay peninsula (Pinang, Singapore), Sumatra, Java, Borneo.

Genus MOLOSSUS.

Molossus, Geoffroy, Annal. du Mus. vi. (1805), p. 154; Peters, Monatsb. Akad. Berl. 1865, p. 574.

Dysopes, Illiger, Prodr. Syst. Mammal. (1811), p. 122.

Ears close together, or united at the bases of their inner margins; tragus very short, sometimes minute; extremity of the muzzle broad, obtuse, or very obliquely truncated; lips smooth or with very indistinct vertical wrinkles; first and fifth toes much thicker than the others, the backs of all the toes with long curved hairs.

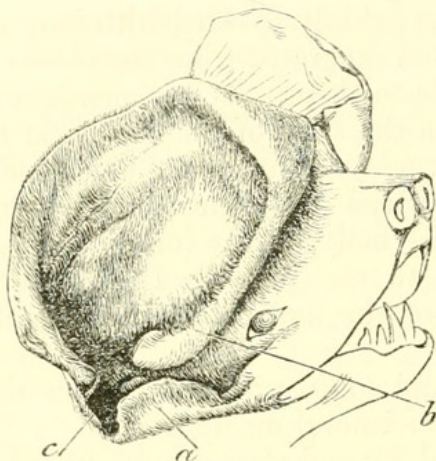
Dentition.—Inc. $\frac{2}{2}$ or $\frac{2}{4}$, C. $\frac{1-1}{1-1}$, Pm. $\frac{1-1}{2-2}$ or $\frac{2-2}{2-2}$, M. $\frac{3-3}{3-3}$.

Premaxillary bones well developed, united; upper incisors strong, their inner margins close together in front; first minute upper premolar generally external to the tooth-row or absent; first lower premolar half the size of the second, standing in the tooth-row (except in *M. rufus*, where it is partly internal and concealed by the closely approximated second premolar).

Range.—Tropical and subtropical regions of America.

In the following analytical table of the species, and in the subsequent descriptions, reference is often made to the different parts of the ear-conch shown and named in the woodcut below, which represents, in half-outline, the head of *Molossus glaucinus*.

Fig. 1.

Head of *M. glaucinus*.

a, Antitragus; *b*, keel of the ear-conch; *c*, notch behind antitragus.

Synopsis of the Species.

- I. Muzzle obtuse, rounded in front; lips smooth, not wrinkled; tragus triangular or linear.
- a*. Antitragus circular, as high as long.
 - a'*. Tragus triangular with a broad base; inner margins of the ears arising by separate points of origin; inc. $\frac{2}{4}$, pm. $\frac{1-1}{2-2}$.
 - a''*. Ears obtusely pointed, forearm 1''2..... 1. *M. tenminckii*, p. 707.
 - b''*. Ears rounded above.
 - a'''*. Centre of breast and abdomen white; forearm 1''35..... 2. *M. planirostris*, p. 707.
 - b'''*. Centre of breast and abdomen not different from sides; forearm 1''7..... 3. *M. brachymeles*, p. 708.
 - b'*. Tragus linear, subacutely pointed, inner margins of the ears arising from the same point or very close together.
 - c''*. Inc. $\frac{2}{2}$, pm. $\frac{1-1}{2-2}$ 4. *M. rufus*, p. 709.
 - d''*. Inc. $\frac{2}{4}$, pm. $\frac{2-2}{2-2}$ 5. *M. nasutus*, p. 711.
 - b*. Antitragus half-oval or half-cordate, longer than high, tragus linear; inc. $\frac{2}{4}$, pm. $\frac{2-2}{2-2}$ 6. *M. abrasus*, p. 712.
- II. Muzzle very obliquely truncate, its superior and external front margins formed by the sharply cut cartilaginous rim of the nostrils, lips smooth or very slightly wrinkled; tragus quadrate; inc. $\frac{2}{4}$, pm. $\frac{2-2}{2-2}$.
- a*. Ears longer than the head; gular sac large; first upper premolar external..... 7. *M. perotis*, p. 713.
 - b*. Ears shorter than the head, gular sac small; first upper premolar in the tooth-row.
 - a'*. Upper lip smooth; forearm 2''3..... 8. *M. glaucinus*, p. 714.
 - b'*. Upper lip slightly wrinkled; forearm 1''8... 9. *M. bonariensis*, p. 715.

Inc. $\frac{2}{4}$; *Pm.* $\frac{1-1}{2-2}$; *ears separate*; *tragus triangular*.

(Subgen. MYOPTERUS, Geoffr.)*

1. MOLOSSUS TEMMINCKII.

Dysopes temminckii, Lund, Burmeister, Thiere Brasiliens, p. 72 (1854).

Molossus (Molossops) temminckii, Peters, Mon. Akad. Berl. 1865, p. 575.

Ears rather small, pointed, their inner margins arising from the forehead by separate points of origin; antitragus circular; tragus short and obtuse, with a broad base. Extremity of the nose slightly prominent, broad, and flat, with an obtuse projection between the nasal orifices, but without arched ridges above them. Lips smooth, with a few straight hairs.

Fur, above, reddish-brown at the extremities, the base of the hairs yellowish-white; beneath, similar, but paler. Integument and membranes dark throughout.

Calcanea very long, reaching almost to the tail.

Length: head and body 1''·5; tail 1''·0, tail free from membrane 0''·5; forearm 1''·2; calcaneum 0''·65.

Hab. Brazil (Lagoa Santa).

The above description has been taken from the original description by Burmeister, as I have not seen the type.

2. MOLOSSUS PLANIROSTRIS.

Molossus (Molossops) planirostris, Peters, Mon. Akad. Berl. 1865, p. 575.

Ears much shorter than the head, their inner margins arising from the sides of the superior surface of the face above and in front of the eyes, their points of origin widely separate; upper three fourths of inner and outer margin regularly convex, forming almost an arc of a circle; keel of the ear-conch very slightly developed; tragus short, triangular, with a broad base, acutely pointed, inner margin straight; antitragus large and round, very similar in shape and size to that of *M. obscurus* (p. 710), but its base is somewhat broader. Muzzle flat, smooth and naked above, extremity obtuse, not obliquely truncated; the margins of the nasal apertures not prominent, placed high above the margin of the upper lip; lips smooth, not wrinkled. A distinct, but not large, gular sac in ♂, rudimentary or absent in ♀. Wings from the distal third of the tibiæ.

Fur very short; above, dark-brown, the bases of the hairs white; beneath, along the sides of the body, brown; the chin, neck, and a broad longitudinal band on the chest and abdomen yellowish-white. The fur of the body extends upon the wing-membrane, above and beneath, nearly as far outwards as a line drawn from the middle of

* These subgenera are indicated here, and at different places further on, for convenience only, in order to avoid repeating the dental formula when describing each species, not for the purpose of pointing out natural subdivisions of the genera.

the humerus to the middle of the femur, the remainder of the membrane nearly naked; a few fine hairs appear behind the distal half of the forearm on the upper surface, and clothe the proximal third of the fifth metacarpal bone; beneath, the wings are quite naked, except along the sides of the body.

Upper incisors long, the centres of their inner sides close together, their bases and summits separated; lower middle incisors slender, with grooved crowns; outer incisors very small, between the middle incisors and the canines, and not grooved. First upper premolar large, close to the canine, with a large anterior and internal basal cusp, and a smaller cusp posterior and external. Lower canine on each side with a small internal basal cusp, which nearly touches its fellow of the opposite side.

Length (of an adult ♂): head and body 2''·3; tail 1''·2; tail free from membrane 0''·4; head 0''·85; ear 0''·6, tragus 0''·15 × 0''·1; forearm 1''·85; thumb 0''·25; second finger—metacarp. 1''·35, 1st ph. 0''·6, 2nd ph. 0''·65; third finger—metacarp. 1''·25, 1st ph. 0''·5, 2nd ph. 0''·2; fourth finger—metacarp. 0''·85, 1st ph. 0''·4, 2nd ph. 0''·15; tibia 0''·4; foot and claws 0''·3.

Hab. Brazil (Buenos Ayres, Barra do Rio Negro); British Guiana (Berbice).

The next species is probably identical with *Myopterus daubentonii*, Geoffroy (Descr. de l'Égypte, ii. p. 113), with which it agrees very closely in the length of its skull, the only remnant of the type of that species, which therefore cannot be accurately determined. Of this skull Prof. Peters (MB. Akad. Berl. 1869, p. 402) has given the following measurements:—"length 0''·85; width across zygomatic arches 0''·5; length of upper tooth-row (not including incisors) 0''·32; length of lower tooth-row 0''·35."

3. MOLOSSUS BRACHYMELES.

Molossus (Molossops) brachymeles, Peters, Monatsb. Akad. Berlin, 1865, p. 575.

Appears to differ from the preceding species only in being conspicuously larger, in the different colouring of the fur of the under surface, and in its slightly different distribution.

Fur above dark brown, the base of the hairs paler; beneath reddish brown. The antebrachial membrane is covered with a small patch of fur along the forearm, and the wing-membrane between the metacarpal bones of the last two fingers and the forearm. Beneath, the fur of the body extends upon the wing-membrane along the sides of the body only; the remaining parts are quite naked.

Total length 4''·0; head 0''·9; ear 0''·6; forearm 1''·7; middle finger 3''·4; tibia 0''·5; foot 0''·46.

Hab. Peru.

The above is taken from Prof. Peters's description of the only specimen known, a stuffed skin, preserved in the Neuchâtel Museum.

Inc. $\frac{2}{2}$; *pm.* $\frac{1-1}{2-2}$; *ears close together, tragus linear.*

(Subgen. MOLOSSUS, Ptrs.)

4. MOLOSSUS RUFUS.

Molossus rufus, Geoffroy, Ann. du Mus. vi. (1805), p. 154; Gervais, Expéd. de Castelnau, Zoologie, p. 58, pl. xii. figs. 4 and 4 a (skull and teeth); Peters, Monatsb. Akad. Berl. 1865, p. 575.

Molossus ursinus, Spix, Sim. et Vespert. Brasil. (1823), p. 58, pl. xxv. fig. iv.

Dysopes alecto, Temminck, Monogr. Mammal. i. p. 231 (1835-41).

Dysopes holosericeus et *albus*, Natt., Wagner, Wiegmann. Archiv, 1843, p. 368. (*Vide* Peters, Mon. Akad. Berl. 1866, p. 22.)

Dysopes ursinus, Wagner, Suppl. Schreb. Säugeth. v. p. 709 (1855).

Ears much shorter than the head, their inner margins arising close together, slightly in front of a line drawn between the eyes, from a point on the forehead, from which a sharp ridge passes forwards on the face to the nose: outer and inner margins of the ear-conch convex, forming almost a regular semicircle; antitragus circular, arising by a narrow base from which it expands equally anteriorly and posteriorly; tragus minute, linear, acutely pointed. Extremity of the muzzle obtuse, rounded, projecting beyond the mandible; the nasal apertures directed forwards and slightly outwards, separated by a considerable interval (which is covered with short erect hairs dilated at their extremities) from the margin of the lip, beyond which the extremity of the nose scarcely projects; lips thick, smooth, without wrinkles.

In the male, the opening of a large glandular sac directed forwards is found opposite the anterior extremity of the sternum; in the female this sac is much smaller.

Wings from the ankles. Fur very short, deep reddish brown above and beneath. The face and ears are nearly naked. On the upper surface, the wing-membrane is covered as far as a line drawn from the middle of the humerus to the middle of the femur, and short fur extends upon half the antebrachial membrane, and behind the distal two-thirds of the forearm to the carpus, covering also the angle between the fourth and fifth metacarpal bones; behind, the base of the interfemoral membrane also is covered. Beneath, the fur of the body extends upon the wing-membrane almost as far outwards as a line drawn from the elbow to the knee; and a band passes outwards behind the elbow, becoming gradually wider towards the carpus, till it occupies a space there extending from the forearm to the middle of the metacarpal bone of the fourth finger, beyond which it passes and occupies the angle between it and the metacarpal of the third finger, being limited in its extent outwards by the muscular band extending to the wing-membrane in this position; a small space between the proximal extremity of the fifth metacarpal and the short muscular band extending from the end of the forearm to the wing-membrane is naked.

Upper incisors moderately long and acutely pointed, converging inwards and forwards, their bases touching the canines, their inner sides approximated; at the outer side of the base of each tooth, a small blunt projection from the cingulum which touches the canines; the single upper premolar large, and close to the canine; lower incisors two, bifid, in front of the closely approximated canines which have each a broad internal basal cusp; first lower premolar scarcely half the size of the second, which lies so close to it as to be with difficulty distinguished in recent specimens as a separate tooth, its outer and posterior side is partially covered by the obliquely directed cingulum of the second premolar; last upper molar narrow, less than half the size of the antepenultimate molar.

Length (of an adult male): head and body 3''·5; tail 2''·0; head 1''·2; ear 0''·65, tragus 0''·1; forearm 2''·1; thumb 0''·4; second finger—metacarp. 2''·0, 1st ph. 1''·05, 2nd ph. 1''·15; third finger—metacarp. 1''·95, 1st ph. 0''·9, 2nd ph. 0''·2; fourth finger—metacarp. 1''·3, 1st ph. 0''·55, 2nd ph. 0''·25; tibia 0''·7; foot and claws 0''·5.

Hab. Mainland of Tropical America (Rio de Janeiro, Pernambuco, Para, Rio Negro, Dutch Guiana, Oaxaca).

Subspecies *a.* **MOLOSSUS OBSCURUS.**

Molossus obscurus, Geoffroy, Annal. du Mus. vi. (1805), p. 154; Gervais, *l. c.* fig. 5 (skull).

Molossus longicaudatus, Geoffroy, *l. c.*

Molossus acuticaudatus, Geoffroy (*vide* Peters, Mon. Akad. Berlin, 1869, p. 402).

Dysopes velox, Natt. Temminck, Monogr. Mammal. i. p. 234 (1836); Wagner, Suppl. Schreb. Säugeth. i. p. 476 (1844), v. p. 712 (1855); Burmeister, Thiere Brasiliens, Th. i. p. 71 (1854).

Molossus velox, Gray, Mag. Zool. Bot. ii. (1838), p. 501.

Molossus fuliginosus, Gray, *l. c.*

Molossus tropidorhynchus, Gray, Ann. Nat. Hist. 1839, p. 5.

Dysopes olivaceo-fuscus, Natt. Wagner, Abh. Münch. Akad. v. p. 202 (1844). (*Vide* Peters, *l. c.* 1866, p. 22.)

Dysopes fumarius, Burmeister, *l. c.* p. 71.

Molossus fumarius, Tomes (non Spix), P. Z. S. 1861, p. 68.

Quite similar to *M. rufus* in structure, but much smaller, the forearm constantly measuring 1''·7 or less, as compared with 2''·1.

The fur covering the wing-membrane between the humerus and forearm extends somewhat further outwards; and the upper incisors are closer together.

It will probably be found hereafter, when a sufficiently large number of specimens are available for examination, that the above-named differences are unimportant, and that the only real difference consists in size.

Length (of an adult ♂): head and body 2''·7; tail 1''·6; head 0''·85; ear 0''·55, tragus 0''·08; forearm 1''·65; thumb 0''·3; second finger—metacarp. 1''·6, 1st ph. 0''·75, 2nd ph. 0''·6; third finger—metacarp. 1·55, 1st ph. 0''·65, 2nd ph. 0''·15; fourth finger

—metacarp. 0''·95, 1st ph. 0''·48, 2nd ph. 0''·2; tibia 0''·55; foot and claws 0''·4.

Hab. Tropical America and its islands; apparently generally distributed. Found in Peru at an elevation of 9000 feet.

Inc. $\frac{2}{4}$; *pm.* $\frac{2-2}{2-2}$; ears close together or united; tragus subacute or quadrate. (Subgen. PROMOPS, Gervais.)

5. MOLOSSUS NASUTUS.

Molossus nasutus, Spix, Simiar. et Vespert. Brasil. p. 58, pl. xxxv. fig. vii. (1823); Peters, Mon. Akad. Berl. 1865, p. 578, pl. fig. 4 (skull).

Molossus fumarius, Spix, l. c. figs. v. and vi.

Promops ursinus, Gervais (non Spix), Expéd. de Castelnau, Zoologie, p. 59, pl. xii. figs. 3, 3a (dentition) (1855).

Ears much shorter than the head; laid forwards, the inner margin of the conch extends slightly further than halfway between the eye and end of the muzzle; inner margins less than one tenth of an inch apart at their bases, uniting on the muzzle in a prominent rounded ridge which ends abruptly at a short distance behind and above the nostrils; inner and outer margins of the ear-conch continuous, forming almost an arc of a circle; ear-keel short, thickened, but not expanded beneath, clothed posteriorly with short hairs; antitragus circular with a narrow base, as in *M. rufus*, but thickened and expanded above and posteriorly, so that its very convex superior and posterior margin projects backwards considerably beyond its base; tragus very small, as in *M. rufus*, with a minute projection at the outer side of its base. Muzzle very obtuse in front, nearly vertically truncated; nostrils directed forwards and slightly outwards, connected above by an ill-defined ridge which does not extend downwards between them, the wide space between the nostrils and the margin of the upper lip occupied by a quadrilateral patch of thickly spread short hairs, the sides of the muzzle almost naked. A large gular sac in ♂, as in *M. rufus*.

Wings from the ankles; interfemoral membrane deep, including quite three fourths of the tail.

Fur moderately long, but conspicuously longer than in *M. rufus*, dark brown above, paler beneath, the base of the hairs whitish on both surfaces. On the upper surface, a band of short fur commences in a narrow line at the beginning of the middle third of the forearm, increases in width outwards so as to cover the proximal third of the fifth metacarpal bone and fourth of the fourth metacarpal, occupying also the portion of wing-membrane between; beneath, the wing-membrane between the humerus and femur is thickly covered, and a band of fur, 0''·3 wide, extends outwards behind the forearm to the fifth metacarpal bone and to the wing-membrane beyond it, covering half the bone.

First upper premolar very small, quite external to the tooth-row.

Length (of an adult ♂ preserved in alcohol): head and body 3''·1; tail 2''·1, tail free from membrane 0''·7; head 0''·9; ear 0''·6,

tragus $0''\cdot08 \times 0''\cdot02$; forearm $2''\cdot0$; thumb $0''\cdot3$; second finger—metacarp. $2''\cdot05$, 1st ph. $0''\cdot95$, 2nd ph. $0''\cdot95$; third finger—metacarp. $2''\cdot0$, 1st ph. $0''\cdot75$, 2nd ph. $0''\cdot15$; fourth finger—metacarp. $1''\cdot2$, 1st ph. $0''\cdot5$, 2nd ph. $0''\cdot22$; tibia $0''\cdot7$; foot and claws $0''\cdot4$.

Hab. Brazil; Central America (Guatemala).

The above description has been taken from an adult male specimen obtained by Mr. Salvin in Guatemala, and preserved in alcohol in the collection of the British Museum. The only other specimens known are imperfectly preserved skins, the types of *M. nasutus*, and *M. fumarius*, Spix, of which the first intelligible description was published by Dr. Peters.

This species is quite intermediate between *M. rufus* (Subg. *Molossus*) and *M. abrasus* (Subg. *Promops*), agreeing with the former in the form of the ear, and even in the distribution of the fur, with the latter in the form and number of the teeth.

6. MOLOSSUS ABRASUS.

? *Molossus ater*, Geoffroy, Annal. du Mus. vi. (1805) p. 153.

Dysopes abrasus, Temminck, Monogr. Mammal. i. p. 232, ii. p. 356 (1835–41); Wagner, Suppl. Schreb. Säugeth. i. p. 475 (1844), v. p. 710 (1855).

Dysopes longimanus, Wagner, Wieg. Archiv, 1843, p. 367; Suppl. Schreb. Säugeth. 1855, p. 709.

Dysopes leucopleura, Wagner, l. c.; Burmeister, Thiere Brasiliens, p. 73 (1854).

Molossus abrasus, Peters, Mon. Akad. Berlin, 1865, p. 574.

Ears much shorter than the head, but conspicuously larger than in *M. rufus*, united by their bases only on the muzzle at a point equally distant from the anterior commissure of the eyelids and the nostrils; outer and inner margins of the ear regularly convex, forming together almost a perfect arc of a circle; antitragus half-cordate, with a broad base, separated behind by a deep notch; keel of the ear-conch well-developed, thickened and expanded externally in lower half; tragus minute, linear, subacutely pointed, slightly larger than in *M. rufus*, but with a broad base.

Muzzle obtuse, nasal apertures directed forwards and slightly outwards, the end of the nose scarcely projecting beyond the margin of the upper lip, which is separated from the margin of the nostrils by a space less wide than in *M. rufus*; the external margins of the nostrils more prominent than in that species, and continued upwards and inwards above the nasal apertures, and downwards between them in a conjoined ridge to the margin of the lip; the upper margin of the nasal disk thus formed on each side is finely and evenly toothed, and the internasal ridge covered with short spoon-shaped hairs, similar to those forming a broad patch between the nostrils and upper lip in *M. rufus*, but strictly limited to this ridge; the margin of the upper lip in front is fringed with straight hairs.

Wings from the ankles, or from the tibiæ slightly higher up. Gular sac distinct in ♂, rudimentary in ♀.

Fur short, and intensely black above and beneath. The muzzle in front of the ears is nearly naked, also the inferior surface of the lower jaw. The fur of the body extends upon the wing-membrane above almost as far as a line drawn from the middle of the humerus to the knee-joint; beneath, as far as a line drawn from the middle of the humerus to the middle of the femur; a small patch of fur appears on the upper surface of the antebrachial membrane near the forearm; and the base of the interfemoral is covered; but the remainder of the membranes are naked.

Upper incisors close together, parallel; lower incisors very small, bifid, the outer incisor on each side concealed between the middle incisor and the base of the canine; inner basal cusps of the lower canines almost touching behind the incisors as in *M. rufus*. First upper premolar very small, scarcely raised above the gum, and scarcely visible without aid of a lens, in the small space between the canine and second premolar, but close to the outer margin of that space; in another specimen, this small premolar is larger, and outside the tooth-row, though a narrow space still intervenes between the canine and the second premolar.

Length (of an adult ♀): head and body 3''·25; tail 1''·8, tail free from membrane 0''·9; head 1''·15; ear 0''·8, tragus 0''·12; forearm 2''·45; thumb 0''·45; second finger—metacarp. 2''·4; 1st ph. 1''·1, 2nd ph. 1''·3; third finger—metacarp. 2''·3, 1st ph. 0''·9, 2nd ph. 0''·4; fourth finger—metacarp. 1''·2, 1st ph. 0''·8, 2nd ph. 0''·35; tibia 0''·7; foot and claws 0''·4.

Hab. Brazil (Mato Grosso, Barra do Rio Negro); Surinam; Peru.

Prof. Peters has very kindly sent me a specimen of this species which he had determined by direct comparison with the type in the Leyden Museum. The absence of a gular sac, mentioned by Temminck, is due to the immature condition of the specimen from which the original description was taken.

7. MOLOSSUS PEROTIS.

Dysopes perotis, Wied, Beitr. Naturg. Brasil. ii. (1825), p. 227; Wagner, Suppl. Schreb. Säugeth. i. p. 473, v. p. 708; Burmeister, Thiere Brasiliens, p. 68 (1854).

Dysopes rufus, Temm. (non Geoffr.), Monogr. Mammal. i. p. 230 (1835–41).

Dysopes (Molossus) gigas, Peters, Mon. Akad. Berl. 1864, p. 381.

Molossus (Promops) perotis, Peters, *l. c.* 1865, p. 574.

Ears very large, united in front; laid forwards, they extend beyond the extremity of the nose; the outer and inner margins of the ear-conch regularly circular; antitragus much longer than high, convex, separated posteriorly by an angular notch, tragus quadrate with rounded angles, no prominent lobule at the base of the outer margin; keel of the ear-conch well developed, thickened and flattened externally. Muzzle very obliquely truncated, the extremity of the nose projecting much beyond the retracted upper lip, which is also concealed by a fringe of short hairs; nasal apertures directed

forwards and downwards; the cartilaginous sharply cut edges of the nostrils projecting laterally and above, terminating the muzzle in front; sides of the face behind the eyes, in front of the ears much flattened, in front of the eyes prominent, convex, concealing the eyes when viewed anteriorly; lips smooth, without vertical wrinkles, sides of the lips very thick, the outer edge exceeding the inner in length, fringed with short fine hairs.

Gular sac large in male, rudimentary in female.

Wings from the lower end of the tibia.

Fur, above, reddish-brown; paler, almost buff, at the base of the hairs; beneath, much paler.

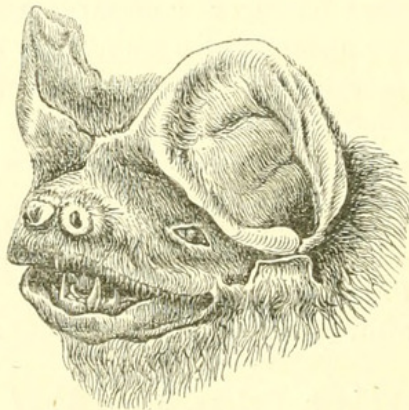
On the upper surface the wing-membrane is covered as far as a line drawn from the middle of the humerus to the knee; and a band of fur extends from the commencement of the middle third of the forearm along its posterior margin to the metacarpal bone of the fourth finger, covering one third of its length, and passing across it to the angle between it and the metacarpal of the third finger; beneath, the wing-membrane external to the humerus is naked.

First upper premolar minute, in the outer angle between the canine and second premolar, lower incisors crowded, bifid.

Length, head and body (about) 5"·0; tail 2"·8; ear 1"·5, tragus 0"·2 × 0"·1; forearm 2"·9; thumb 0"·45; second finger—metacarp. 3"·0, 1st ph. 1"·35, 2nd ph. 1"·6; third finger—metacarp. 2"·9, 1st ph. 1"·15, 2nd ph. 0"·25; fourth finger—metacarp. 1"·65, 1st ph. 0"·9, 2nd ph. 0"·35; foot and claws 0"·65.

Hab. Brazil (Lagoa Santa; Parahyba; Barra do Rio Negro); Bolivia.

Fig. 2.



Head of *M. glaucinus*.

8. MOLOSSUS GLAUCINUS.

Dysopes glaucinus, Natt., Wagner, Wieg. Archiv. 1843, p. 368; Suppl. Schreb. Säugeth. v. p. 710 (1855); Burmeister, Thiere Brasiliens, p. 73 (1854); Peters, Mon. Akad. Berl. 1866, p. 22.

Molossus ferox, Gundlach, Mon. Akad. Berl. 1861, p. 149; Peters, l. c. 1865, p. 574.

In the form of the muzzle and ears very similar to the preceding species; but the ears are comparatively much smaller; laid forwards,

the inner margin of the ear-conch reaches to within one tenth of an inch from the extremity of the muzzle; inner margins of the ears united by their bases on the muzzle at a point nearer to the extremity of the nose than to the anterior commissure of the eyelids; outer and inner margins of the conch regularly convex; antitragus separated by a deep and narrow emargination, commencing anteriorly in a plane slightly above the angle of the mouth, tragus small, quadrate, superior margin straight, outer and inner margins concave, no projecting lobule at the base of the outer margin; keel of the ear-conch as in *M. perotis*, terminating posteriorly and inferiorly in a deep, thick, flattened ridge, which is in the same perpendicular line with, and almost touches the antitragus.

A smaller gular sac in ♂, rudimentary in ♀, opening directed downwards and slightly forwards.

Wings from the ankles; distribution of fur upon the wing-membranes as in *M. perotis*; above, light brown at the base of the hairs, then chestnut-brown, the extreme tips greyish, so that the upper surface appears altogether grey; beneath similarly coloured but much paler.

Upper and lower incisors as in *M. perotis*; the first upper pre-molar scarcely elevated above the gum, in the centre of the space between the canine and second premolar.

Length (of an adult ♀): head and body 3''·1; tail 2''·15, tail free from membrane 1''·0; head 1''·2; ear 0''·9, tragus 0''·12; forearm 2''·35; thumb 0''·35; second finger—metacarp. 2''·35, 1st ph. 1''·0, 2nd ph. 1''·2; third finger—metacarp. 2''·25, 1st ph. 0''·85, 2nd ph. 0''·3; fourth finger—metacarp. 1''·2, 1st ph. 0''·75, 2nd ph. 0''·35; tibia 0''·8; foot and claws 0''·5.

Hab. Brazil (Mato Grosso); Surinam; Jamaica; Cuba.

9. MOLOSSUS BONARIENSIS.

Promops bonariensis, Peters, Mon. Akad. Berl. 1874, p. 232 (cum fig., pl.).

Ears united by a deeper band than in *M. glaucinus*; ear-conch as broad as high; antitragus broader than high, convex; tragus quadrate, as in the preceding species. Muzzle obliquely truncated, extremity of the nose almost double as broad as the base of the antitragus; upper lip with a few shallow vertical wrinkles.

Wing-membrane from the ankles.

Fur rather short, somewhat shorter above than beneath. Beneath, the wing-membrane is covered as far as a line drawn from the middle of the humerus to the knee; a few short hairs extend along the posterior margin of the forearm. Above, the outer half of the antebranchial membrane is covered with short woolly hairs; and a band of similar hairs passes outwards behind the forearm, becoming gradually so broad as to cover almost half the metacarpal bone of the last finger. Above, reddish brown, the base of the hairs whitish; paler beneath, the extremities of the hairs brownish white.

The skull agrees in size with that of *M. nasutus*, Spix; but the facial portion is much longer, and the brain-case wider than in that

species. Upper incisor on each side with a short outer basal cusp, and separated from the canine by a slight interval; first upper small premolar in the space between the canine and second premolar.

Length: head and body 3''·0; tail 1''·4, tail free from membrane 0''·65; head 1''·0; ear 0''·6, tragus 0''·12; forearm 1''·8; thumb 0''·34; second finger—metacarp. 1''·8, 1st ph. 0''·7, 2nd ph. 0''·65; third finger—metacarp. 1''·7, 1st ph. 0''·6, 2nd ph. 0''·2; fourth finger—metacarp. 0''·65, 1st ph. 0''·55, 2nd ph. 0''·15; tibia 0''·55; foot and claws 0''·44.

Hab. Buenos Ayres.

I have not seen the single specimen as yet obtained of this recently described species. I have therefore been obliged to copy Prof. Peters's original description, which is accompanied by an excellent plate.

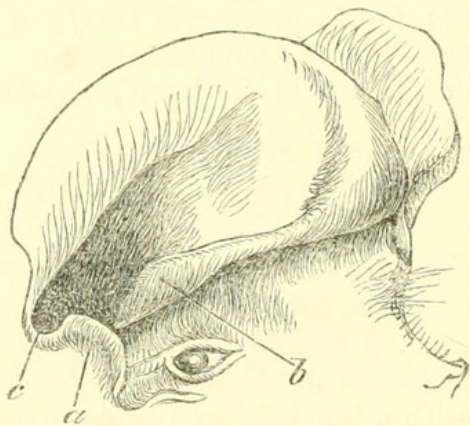
Genus NYCTINOMUS.

Nyctinomus, Geoffroy, Descript. de l'Egypte, ii. p. 114 (1812); Horsfield, Zool. Researches in Java; Gray, Mag. Zool. Bot. ii. (1838), p. 500; Peters, Mon. Akad. Berl. 1865, p. 573.

Dinops, Savi, Nuov. Giorn. de' Lett. p. 230 (1825); Bullet. des Scien. Nat. viii. p. 286 (1826).

Dysopes, Cretzschmar (non Illiger), Rüppell, Atlas Reise nördl. Afrika, Zoolog. (1826), p. 69; Temminck (in part), Monogr. Mammal. i. p. 226 (1835-41).

Fig. 3.



Head of *Nyctinomus macrotis*.

a. Antitragus; b. Keel of the ear-conch; c. Notch behind antitragus.

Ears united on the muzzle, or close together by the bases of their inner margins; tragus short, quadrate, or rounded off above, never linear; extremity of the muzzle broad, very obliquely truncated, projecting considerably beyond the lower lip, terminated by the sharply cut margin of the nostrils; upper lip very expansible, generally deeply grooved with vertical wrinkles; wings and feet as in *Molossus*.

Dentition.—Inc. $\frac{2}{6}$ or $\frac{2}{4}$, C. $\frac{1-1}{1-1}$, Pm. $\frac{2-2}{2-2}$ or $\frac{1-1}{2-2}$, M. $\frac{3-3}{3-3}$.

Premaxillary bones separate in front or conjoined by cartilage only, upper incisors close to the canines by their bases, separate in front, their cusps converging inwards and forwards.

Range.—Generally distributed throughout the tropical and warmer parts of the temperate zones of both hemispheres.

In the following analytical table of the species, and in the subsequent descriptions, reference is often made to the different parts of the ear-conch which are shown and named in the drawing (see p. 716), which represents, in half-shading, the head of *Nyctinomus macrotis*, Gray.

Synopsis of the Species.

I. Premolars $\frac{2-2}{2-2}$.

- a.* Integument of the ears thick, opaque; keel of the ear-conch thickened in lower third; antitragus separated by a deep notch.
 - a'* Lips smooth; inner margins of the ears arising from the muzzle by distinct points of origin; tragus broad, rounded off above.
 - a.* Antitragus irregularly quadrate; lower incisors 4 1. *N. africanus*, p. 719.
 - b'* Lips furrowed by deep vertical wrinkles.
 - a''.* Ears separate or conjoined at the bases of their inner margins only; tragus broad, rounded off above.
 - a'''.* Ears conjoined at the bases of their inner margins; gular sac distinct in ♂.
 - β.* Antitragus obliquely triangular, rounded; lower incisors 6 2. *N. cestoni*, p. 719.
 - b'''.* Ears separate; no gular sac.
 - γ.* Antitragus half oval.
 - α'.* Lower incisors 4 3. *N. ægyptiacus*, p. 721.
 - β'.* Lower incisors 6 4. *N. tragatus*, p. 721.
 - b''.* Ears conjoined by a more or less deep band; tragus small; no gular sac.
 - c'''.* Ears conjoined at the bases of their inner margins.
 - a.* Fur unicoloured; wings from the lower end of the tibiæ 5. *N. plicatus*, p. 721.
 - β.* Fur greyish on the surface; wings from the middle of the tibiæ ... 6. *N. bivittatus*, p. 722.
 - d'''.* Ears conjoined by a deep band in front.
 - a.* The first upper premolar stands in the tooth-row.
 - α'.* Lower third of the ear-keel much thickened and flattened externally .. 7. *N. brachypterus*, p. 722.
 - β'.* Lower third of the ear-keel slightly thickened, not flattened externally.
 - a''.* Fur of the chest and abdomen uniform in colour 8. *N. pumilus*, p. 723.
 - β''.* Fur of the lower half of the chest and the abdomen white..... 9. *N. limbatus*, p. 724.

- β . The first upper premolar external to the tooth-row.
 γ' . Lower third of the ear-keel slightly thickened, not flattened externally.
 γ'' . Tragus quadrate 10. *N. angolensis*, p. 724.
 δ' . Lower third of the ear-keel much thickened and flattened externally.
 δ'' . Tragus narrow, much longer than broad, rounded off above 11. *N. miarensis*, p. 725.
 ϵ'' . Tragus quadrate 12. *N. mops*, p. 726.
 e'' . Ears conjoined by a very deep band anteriorly, and, posteriorly, by a second low band 13. *N. johorensis*, p. 726.
b. Integument of the ears thin, translucent; keel of the ear-conch slender, deep, bent backwards on itself.
 a' . Antitragus separated by a deep notch; lower incisors 4.
 a'' . Muzzle thick, not concave in front of the eyes; upper lip with vertical wrinkles.
 a''' . Ears separate; a large gular sac ... 14. *N. australis*, p. 728.
 b''' . Ears united by a low band near the extremity of the muzzle; no gular sac 15. *N. megalotis*, p. 728.
 b'' . Muzzle concave between the eyes and extremity of the nose; upper lip furrowed by deep oblique wrinkles; ears united on the forehead slightly in front of the eyes; no gular sac.
 c''' . Ears united by a deep band, antitragus much longer than high ... 16. *N. macrotis*, p. 729.
 d''' . Ears united by a low band; antitragus as high as long 17. *N. gracilis*, p. 731.
b'. Antitragus separated by a very shallow notch; lower incisors 6.
 c'' . Muzzle flat in front of the ears; upper lips with vertical wrinkles.
 e''' . Ears separate.
 α . Tragus quadrate, broad above; first upper premolar in the centre of the space between the canine and second premolar ... 18. *N. brasiliensis*, p. 731.
 β . Tragus triangular, narrow above; first upper premolar larger, filling up the space between the canine and second premolar ... 19. *N. norfolcensis*, p. 732.
II. Premolars $\frac{1-1}{2-2}$.
 c' . Antitragus separated by a very shallow notch, lower incisors 6.
 d'' . Muzzle flat or rounded off above; upper lip with ill-defined vertical wrinkles.
 f''' . Ears separate, tragus triangular, rounded off above.
 α . Ear broad above, upper third of the inner margin straight 20. *N. albiventer*, p. 733.
 β . Ear narrow above, upper third of the inner margin deeply concave 21. *N. acetabulosus*, p. 734.

Inc. $\frac{2}{4}$ or $\frac{2}{6}$; *pm.* $\frac{2-2}{2-2}$; ears united or close together.

(Subgen. NYCTINOMUS, Peters.)

1. NYCTINOMUS AFRICANUS.

Nyctinomus africanus, Dobson, Ann. & Mag. Nat. Hist. ser. 4, vol. xviii. p. 348 (1876).

Ears large, their inner margins arising from perfectly distinct points of origin though close together, outer and inner margins of the ear-conch regularly convex, forming an arc of a circle; anti-tragus irregularly quadrilateral with a broad base, separated posteriorly by a moderately deep notch, upper margin straight or even slightly concave; tragus broad, evenly rounded off above; keel of the ear very prominent, thickened and flattened externally in lower third.

Fur bright orange-chestnut above and beneath. The fur of the body extends upon the wing-membrane above almost as far as a line drawn from the middle of the humerus to the knee, and upon the base of the interfemoral membrane; the remainder of the upper surface is naked. Beneath, the fur scarcely extends so far outwards upon the wing-membrane between the humerus and femur as upon the upper surface; but a narrow band of short hairs passes outwards behind the posterior margin of the forearm to the carpus.

Lower incisors 4, not crowded; first upper premolar very short and blunt, but occupying by its base the whole space between the canine and second premolar.

Length: head and body 3''·4; tail 2''·4, tail free from membrane 1''·5; head 1''·2; ear 1''·0, tragus 0''·3 × 0''·15; forearm 2''·5; thumb 0''·4; second finger—metacarp. 2''·4, 1st ph. 1''·1, 2nd ph. 1''·3; third finger—metacarp. 2''·15, 1st ph. 0''·9, 2nd ph. 0''·35; fourth finger—metacarp. 1''·25, 1st ph. 0''·75, 2nd ph. 0''·3; tibia 0''·75; foot and claws 0''·45.

Hab. South Africa (Transvaal Republic). Type in the collection of the British Museum.

2. NYCTINOMUS CESTONI.

Dinops cestonii, Savi, Nuov. Giorn. de' Letter. p. 230 (1825); Bullet. des Sci. Nat. viii. p. 286 (1826); Temminck, Monogr. Mammal. i. p. 262 (1835-41).

Dysopes rüppellii, Temm. l. c. ii. p. 224.

Dysopes midas, Sundevall, Stockh. Vet. Ak. Handl. 1842, p. 207.

Dysopes cestonii, Wagner, Suppl. Schreb. Säugeth. v. p. 702; var. *nigrogriseus*, Schneider, Nouv. Mém. Soc. Helvét. xxiv. 1871, p. 9.

Nyctinomus insignis, Blyth, Cat. Mamm. Mus. A. S. Beng. (1863).

Nyctinomus (*Dysopes*) *ventralis*, Heuglin, Nova Acta Acad. Leop.-Carol. 1861, p. 11*.

Dysopes (*Molossus*) *rueppellii*, Swinhoe, P. Z. S. 1870, p. 619.

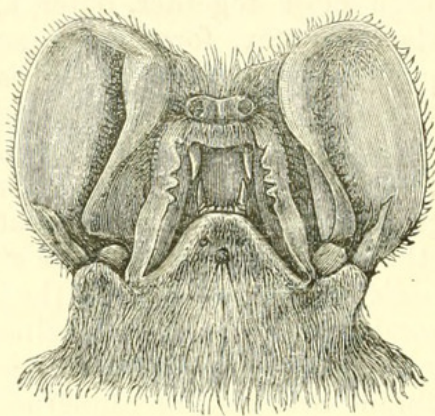
Nyctinomus cestonii, Dobson, Mon. As. Chiropt. p. 180 (1876).

Ears united by the bases of their inner margins on the muzzle at

* The type of *N. ventralis* is preserved in the Stuttgart Museum, and, Dr. Krauss informs me, is identical with *N. cestoni*.

a short distance from the extremity of the nose, their round superior and internal margins projecting slightly beyond the end of the muzzle (fig. 4); general form of the ear-conch and tragus as in preceding species; but the tragus is proportionally larger, and the antitragus is obliquely triangular and separated posteriorly by a deep

Fig. 4.

Head of *Nyctinomus cestoni*.

notch. Upper lips very thick, with well-marked vertical wrinkles (fig. 4). Males with a small glandular gular sac, opening in the centre of the inferior surface of the neck, slightly in front of the anterior extremity of the sternum, by a circular orifice concealed by the fur.

Wings from the distal third of the tibia.

Fur, above, reddish-brown with an orange tinge, the extreme tips of the hairs greyish; beneath, similar but paler. The wing-membrane on the upper surface is covered as far as a line drawn from the middle of the humerus to the knee, and the base of the interfemoral membrane; the antebrachial membrane is clothed with short fur; the forearm, legs, and remainder of the wings naked. Beneath, the fur extends outwards to a less distance, ending by an abrupt well-defined, straight margin; the antebrachial membrane is naked. The lower margin of the upper lip is fringed with fine hairs; the face is almost naked; a few short hairs form an arch on the inner side of the ear-conch; and the cutaneous band connecting the inner sides of the ears with the muzzle is clothed with erect hairs.

First upper premolar minute, acutely pointed, in the centre of the space between the canine and second large premolar; lower incisors 6, the central pair in front of next two, which touch the small incisors on each side next the canines, but do not overlap them.

Length (of an adult ♂): head and body 3''·4; tail 2''·0, tail free from membrane 1''·1; head 1''·3; ear 1''·2, tragus 0''·25 × 0''·20; forearm 2''·4; thumb 0''·35; second finger—metacarp. 2''·4, 1st ph. 0''·95, 2nd ph. 1''·25; third finger—metacarp. 2''·2, 1st ph. 0''·8, 2nd ph. 0''·5; fourth finger—metacarp. 1''·3, 1st ph. 0''·7, 2nd ph. 0''·3; tibia 0''·75; foot and claws 0''·4.

Hab. Europe (Switzerland, Italy, Sicily, Greece); Africa (Egypt, Nubia); Asia (Amoy, China).

3. NYCTINOMUS ÆGYPTIACUS.

Nyctinomus ægyptiacus, Geoffroy, Descr. de l'Égypte, ii. p. 128, pl. ii. (1812).

Dysopes geoffroyi, Temminck, Monogr. Mammal. i. p. 226 (1835-41); Wagner, Suppl. Schreb. Säugeth. i. p. 469 (1844).

Much smaller than *N. africanus*. Ears quite separate, but close together by the bases of their inner margins; outer and inner margins of the ear-conch evenly convex, forming almost an arc of a circle above; antitragus half-oval, separated by a deep notch posteriorly; tragus broad and rounded off above as in the preceding species. Lips with vertical wrinkles.

Wing-membrane from the lower part of the tibiæ, near the ankles.

Fur, deep smoke-brown above, paler beneath. Distribution of hair on the membranes as in *N. cestoni*, except on the antebrachial membrane, which is nearly naked.

Length (of the type, an adult ♂ specimen preserved in alcohol): head and body 2''·6; tail 1''·6, tail free from membrane 0''·9; head 0''·95; ear 0''·9, tragus 0''·23 × 0''·15; forearm 1''·95; thumb 0''·28; second finger—metacarp. 1''·9, 1st ph. 0''·75, 2nd ph. 0''·8; third finger—metacarp. 1''·8, 1st ph. 0''·6; 2nd ph. 0''·4; fourth finger—metacarp. 1''·15, 1st ph. 0''·55, 2nd ph. 0''·3; tibia 0''·5; foot and claws 0''·35.

Hab. Africa (Egypt). Type in the collection of the Paris Museum.

4. NYCTINOMUS TRAGATUS.

Nyctinomus tragatus, Dobson, J. A. S. B. 1874, p. 143, Monograph Asiatic Chiroptera, p. 181 (1876).

This species resembles *N. ægyptiacus* very closely, but is larger, and has always six lower incisors. That this is not due to age (as the young have generally six lower incisors, even in species in which four is the normal number in the adult animal) is shown by the relative measurements of this species and *N. ægyptiacus*, and by the presence in every specimen (as yet examined) of this species of six lower incisors.

Length: head and body 2''·9; tail 1''·7, tail free from membrane 0''·85; ear 0''·9, tragus 0''·23 × 0''·15; forearm 2''·0; second finger 3''·6; fourth finger 1''·9; tibia 0''·6; foot and claws 0''·35.

Hab. Peninsula of India (Rajanpur, N.W. frontier; Jashpur near Chutia Nagpur; Calcutta).

Type in the collection of the Indian Museum, Calcutta.

5. NYCTINOMUS PLICATUS.

Vespertilio plicatus, Buchanan-Hamilton, Trans. Linn. Soc. v. p. 261, fig. (1800).

Nyctinomus bengalensis, Geoffr. Descr. de l'Égypte, ii. p. 130 (1812).

Nyctinomus tenuis et *N. dilatatus*, Horsfield, Zoolog. Researches in Java (1825); Cantor, J. A. S. B. xv. p. 179.

Dysopes murinus, Gray, Illustr. Ind. Zool. vol. i. pl. i. (1830.)

Dysopes plicatus, Temminck, Monogr. Mamm. i. p. 223 (1835-41).

Dysopes tenuis, Temminck, *l. c.* p. 228.

Nyctinomus plicatus, Jerdon, *Mammals of India*, p. 33 (1867); Dobson, *J. A. S. B.* 1874, p. 143; *Monogr. Asiat. Chiropt.* p. 182 (1876).

About the same size as *N. ægyptiacus*; but the ears are united by a low band in front, which forms an obtuse, slightly elevated, angular projection on the muzzle, and the tragus is very small, quadrate, the superior margin slightly concave, the outer margin with a small projection at the base; margin of the ear-conch evenly and broadly rounded off above; antitragus half oval, separated posteriorly by a deep notch. Upper lip very thick, deeply grooved by vertical wrinkles.

Wing-membrane from the lower end of the tibia.

Fur very dense and soft; above bluish-black or smoke-black, beneath somewhat paler.

First upper premolar small, in the space between the canine and second premolar.

Length (of an adult ♂): head and body 2''·9; tail 1''·7, tail free from membrane 1''·1; head 1''·0; ear 0''·9, tragus 0''·1 × 0''·03; forearm 1''·95; second finger 3''·9; fourth finger 1''·7; tibia 0''·7; foot and claws 0''·35.

Hab. Peninsula of India (Calcutta, Ludiana, Agra, Madras); Sumatra; Java; Borneo; Malay peninsula (Singapore); Philippine Islands.

6. NYCTINOMUS BIVITTATUS.

Nyctinomus bivittatus, Heuglin, *Nova Acta Ac. Leop.-Car.* 1861, p. 13.

Ears conjoined by a low band, very slightly raised above the muzzle; tragus very small, quadrate; upper lip grooved by vertical wrinkles.

Base of the thumb with a remarkably large circular callous pad. Wings from the middle of the tibiæ.

Fur above umber-brown; the extremities of the hairs conspicuously tipped with grey, especially on the top of the head, where either side is streaked with grey, and on the shoulders and middle of the back spotted over with the same colour; beneath similar but paler. Distribution of the fur and dentition as in *N. plicatus*.

Length (of the type specimen, an adult ♂): head and body 2''·7; tail 1''·6; tail free from membrane 1''·15; head 1''·0; ear 0''·8; tragus 0''·1; forearm 1''·9; thumb 0''·35; second finger 3''·8; fourth finger 1''·8; tibia 0''·6; foot and claws 0''·4.

Hab. N.E. Africa (Bogos Land). Type in the collection of the Stuttgart Museum.

This species is very closely allied to *N. plicatus*, of which it may be considered the African representative.

7. NYCTINOMUS BRACHYPTERUS.

Dysopes brachypterus, Peters, *Reise nach Mossambique, Säugeth.* p. 59 (1852).

Ears much shorter than the head, conjoined by a deep band on

the muzzle as far forward as a point corresponding to the position of the upper incisors beneath; outer and inner margins continuous, evenly convex above, the inner margin with three minute horny points; antitragus well developed, separated by a deep notch, quadrangular with shortly rounded angles, the length of its base but slightly exceeding the depth of its anterior margin; tragus small, quadrate, its superior margin directed upwards and inwards, a small projection at the base of its outer margin; keel of the ear-conch large, thickened, expanded, and flattened externally in its lower third. Extremity of the nose projecting very much, the distance from the anterior margin of the nostril to the margin of the upper lip exceeding the diameter of the base of the antitragus; upper lip with vertical wrinkles.

Wings-membrane from the middle of the tibia.

Fur very short above and beneath; dark brown above, the base of the hairs whitish; beneath dirty yellowish-white, the sides of the body brown.

The first upper premolar stands in the tooth-row and fills up the narrow space between the canine and second premolar; lower incisors very small, not occupying all the space in front of the canines.

Length (of an adult ♀ specimen): head and body 2''·25; tail 1''·25, tail free from membrane 0''·8; head 0''·9; ear 0''·7, tragus 0''·1 × 0''·03; forearm 1''·35; thumb 0''·3; second finger—metacarp. 1''·35, 1st ph. 0''·55, 2nd ph. 0''·7; third finger—metacarp. 1''·3, 1st ph. 0''·45, 2nd ph. 0''·35; fourth finger—metacarp. 0''·8, 1st ph. 0''·35, 2nd ph. 0''·15; tibia 0''·45; foot and claws 0''·3.

Hab. Africa (Sierra Leone, Lagos, Mozambique). Type in the collection of the Berlin Museum.

8. NYCTINOMUS PUMILUS.

Dysopes pumilus, Cretzsch., Rüppell, Atlas, Reise nördl. Afrika, Zool. p. 69, pl. xxvii. (1826); Temminck, Monogr. Mamm. ii. p. 354 (1835-41); Wagner, Suppl. Schreb. Säugeth. i. p. 470 (1844).

Ears shorter than the head, united upon the muzzle as in the preceding species, but by a deeper band; outer and inner margins of the ear-conch continuous, evenly rounded above, the inner margin with three minute horny points; antitragus half-oval, arising abruptly from a point behind and on the same level with the angle of the mouth, directly below the posterior commissure of the eyelids, separated posteriorly by a narrow moderately deep notch; tragus small, quadrate, superior margin straight, parallel to the base of the tragus; keel of the ear-conch small, straight, not expanded in lower third. Extremity of the muzzle not projecting as much as in the preceding species, the distance from the anterior margin of the nostril to the margin of the upper lip not exceeding the length of the base of the antitragus; upper lip very expansible, with deep vertical wrinkles.

Wing-membrane from the distal third of the tibia.

Fur rather short, but longer than in the preceding species; above, whitish at the base, then dark brown to the tips of the hairs; be-

neath, less white at the base of the hairs, but slightly greyish at the tips.

Distribution of the fur upon the wing-membrane as in *N. cestoni*; a narrow band of short hairs behind the anterior two thirds of the forearm on the upper surface.

In ♂ a thick tuft of long hairs arises from the back of the deep band connecting the ears; in ♀ this hair is not longer than on the adjoining inner sides of the backs of the ears.

Lower incisors very small, crowded; first upper premolar minute, with an acute cusp, in the centre of the space between the canine and second premolar.

Length (of an adult ♂): head and body 2''·1; tail 1''·25, tail free from membrane 0''·75; head 0''·8; ear 0''·65, tragus 0''·1 × 1 0''·03; forearm 1''·5; thumb 0''·7; second finger—metacarp. 1''·4, 1st ph. 0''·6, 2nd ph. 0''·7; third finger—metacarp. 1''·35, 1st ph. 0''·5, 2nd ph. 0''·4; fourth finger—metacarp. 0''·85, 1st ph. 0''·4, 2nd ph. 0''·2; tibia 0''·5; foot and claws 0''·25.

Hab. Africa (Abyssinia, Nubia, Egypt).

9. NYCTINOMUS LIMBATUS.

Dysopes limbatus, Peters, Reise nach Mossambique, Säugeth. i. p. 56 (1852).

Nyctinomus leucogaster, Grandidier, Rev. et Mag. Zool. 1869, p. 337.

This form can be distinguished from *N. pumilus* only by the different colour of the fur of the ventral surface and of the wing-membranes, and by the slightly broader tragus. In every other respect it agrees so perfectly in structure and measurements with that species, that I can scarcely consider it specifically distinct.

Fur above dark brown, also the shoulders, throat, and upper part of the breast; the remaining parts of the ventral surface pale yellowish white, and the wing, antebrachial, and inferior surface of the interfemoral membrane of the same colour. In immature individuals the white colour of the ventral surface is not so much extended, but appears as a more or less broad patch on the abdomen, increasing in extent according to age.

Hab. Africa, south of the Equator (Zanzibar, Mozambique, Angola); Madagascar.

This appears to be the southern representative of *N. pumilus*.

10. NYCTINOMUS ANGOLENSIS.

Nyctinomus angolensis, Peters, Journ. Scien. Mathem. Phys. e Natur. Lisboa, vol. iii. p. 124 (1870).

Ears much shorter and more triangular than in any of the species previously described, conjoined on the muzzle by a very deep band, as in *N. pumilus*; the antitragus and keel of the ear-conch as in that species; integument of the ears thick; tragus very small, quadrate, superior margin directed upwards and outwards. Upper lip remarkably thick in front, so that the extremity of the nose does not project much beyond its margin, its sides grooved by vertical furrows.

Thumb long; feet large; wing-membrane from the middle of the tibiae.

Fur above and beneath very short; above white at the base, terminal three fourths of the hairs deep reddish-brown; beneath, yellowish-white or pale reddish-yellow; the shoulders, sides of the neck, chest, and abdomen reddish brown. On the upper surface the membranes are almost quite naked; beneath, the wing-membrane is covered with very short fine pale yellowish-white hairs as far outwards as a line drawn from the middle of the humerus to the knee; and similar short fur appears upon the interfemoral membrane.

First upper premolar very small, scarcely visible without the aid of a lens, in the outer angle between the closely approximated canine and second premolar; sometimes deciduous. Lower incisors crowded. Length (of an adult ♀): head and body 2''·9; tail 1''·8, tail free from membrane 0''·95; head 1''·05; ear 0''·75, tragus 0''·1 × 0''·03; forearm 1''·85; thumb 0''·45; second finger—metacarp. 1''·85, 1st ph. 0''·85, 2nd ph. 1''·25; third finger—metacarp. 1''·8, 1st ph. 0''·7, 2nd ph. 0''·65; fourth finger—metacarp. 1''·2, 1st ph. 0''·55, 2nd ph. 0''·22; tibia 0''·65; foot and claws 0''·4.

Hab. Africa (Angola, Coanza river); Madagascar (Mahanora).

Nyctinomus hepaticus, Heuglin (Nov. Act. Acad. Leop.-Car. xxiii. 1864, p. 14), appears from the original description to be very closely allied to, if not identical with, *N. angolensis*. But Dr. Krauss informs me that the type is not in the Royal Zoological Museum at Stuttgart, where the types of the other species of Bats described by Herr von Heuglin are preserved; and he doubts whether any specimen of the species was brought by the describer to Europe. As the description is very imperfect, and as the type cannot be found, this species must remain doubtful.

11. NYCTINOMUS MIARENSIS.

Nyctinomus miarensis, Grandidier, Rev. et Mag. Zool. 1869, p. 337.

Nyctinomus unicolor, Grandidier, *l. c.* 1870, p. 49.

About the same size as *N. cestoni*. Ears shorter than the head, united on the muzzle by a band about 0''·15 high in the centre, at a distance of 0''·2 behind the extremity of the nose; ear-conch broadly rounded off above, the outer and inner margin continuous; antitragus longer than high, irregularly quadrate, the shortest side above, separated by a deep notch posteriorly; tragus narrow, much longer than broad, shortly rounded off above, inner margin slightly concave, outer straight, in general shape altogether different from that of any of the previously described species; keel of the ear-conch well developed, prominent, thickened and expanded in lower third, upper lip very expansible, deeply grooved by vertical furrows.

Thumb short, with a large circular callosity. Wings from the lower end of the tibiae. Fur above dark brown, beneath brown with slightly ashy extremities.

Lower incisors 4, the middle incisors overlapping the outer ones; PROC. ZOOL. SOC.—1876, No. XLVIII. 48

first small upper premolar crushed in between the canine and second premolar, and rather to the outer side.

Length (of an adult ♀ specimen, the type): head and body 3''·5; tail 1''·65, tail free from membrane 1''·0; head 1''·3; ear 1''·0, tragus 0''·15 × 0''·4; forearm 2''·4; thumb 0''·35; second finger—metacarp. 2''·4, 1st ph. 0''·5, 2nd ph. 1''·4; third finger—metacarp. 2''·25, 1st ph. 0''·85, 2nd ph. 0''·6; fourth finger—metacarp. 1''·35, 1st ph. 0''·75, 2nd ph. 0''·3; tibia 0''·7; foot and claws 0''·5.

Hab. Madagascar. Type in the Paris Museum.

12. NYCTINOMUS MOPS.

Dysopes mops, F. Cuvier, Dents des Mammif. p. 49 (1825).

Mops indicus, Lesson, Table du Règne Anim. Mamm. p. 18 (1842); Peters, Monatsb. Akad. Berl. 1869, p. 402.

Nyctinomus mops, Dobson, Monogr. Asiatic Chiroptera, p. 182 (1876).

Ears larger than in *N. angolensis*; upper three fourths of the margin of the ear-conch regularly convex, forming almost an arc of a circle; inner margins conjoined by a deep band 0''·2 high in the centre; tragus very small, quadrate; antitragus large, quadrilateral with rounded angles, nearly as high as long, separated posteriorly by a deep notch, ending abruptly anteriorly, close to the angle of the mouth. Upper lip with deep vertical wrinkles.

Thumb rather long, armed with a well-developed claw; wings from the lower third of the tibia.

Fur very short above and beneath; on the dorsal surface dark brown, somewhat paler beneath, extending upon the wing-membrane along the sides of the body only.

Upper incisors short, separated by a small interval in front; lower incisors 4, crowded; first upper premolar very small, deciduous, in the outer angle between the closely approximated canine and second premolar.

Length (of the type specimen): head and body 3''·0; tail 1''·5, tail free from membrane 0''·95; ear 0''·95, tragus 0''·1; forearm 1''·8; thumb 0''·4; second finger 3''·5; fourth finger 1''·8; tibia 0''·7; foot and claws 0''·45.

Hab. Sumatra.

This species is closely allied to *N. angolensis*, agreeing with it in the position of the minute first upper premolar (which is quite external to the tooth-row), in the remarkable length of the thumb as compared with other species of this genus (except *N. johorensis*), and in the peculiar shortness of the fur. It is, however, readily distinguished by the form and size of the ears, and by other characters described above.

13. NYCTINOMUS JOHORENSIS.

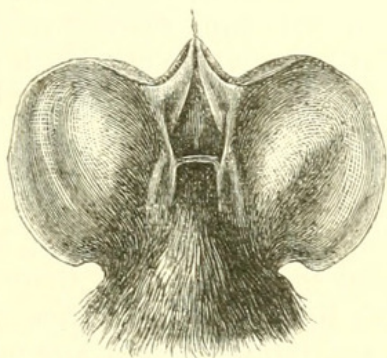
Molossus (Nyctinomus) johorensis, Dobson, Proc. Asiat. Soc. Beng. 1873, p. 22.

Nyctinomus (Chærephon) johorensis, Dobson, Journ. Asiat. Soc. Beng. 1874, p. 144.

Nyctinomus johorensis, Dobson, Monogr. Asiat. Chiroptera, p. 183 (1876).

Ears as in *N. plicatus*; but their inner margins are connected by a band of integument which extends forwards on the muzzle as far as a point placed midway between a line joining the eyes and the ex-

Fig. 5.



Head of *N. johorensis*.

tremity of the muzzle; this connecting band is continued upwards and backwards between the ears to a height of 0''·4 inch, forming an incomplete funnel open behind, wide below, and narrow above. At a distance of about 0''·3 inch from the anterior connecting band, the ears are again connected by a second fold of integument, posterior and parallel to the first, about 0''·1 inch in vertical height (fig. 5). Between these two connecting folds of integument and the sides of the ear a hollow square is contained. This concavity is empty, and open only from above. At the base of the funnel-shaped anterior boundary a few long hairs exist, as in *N. pumilus*. Margin of the ear-conch evenly convex above; antitragus large, separated by a deep notch; tragus very small, quadrate, superior margin slightly concave.

The animals of this genus possess the power of folding the ear-conch forwards, downwards, and outwards, thus closing the external ear. When the ears are closed, the superior part of the funnel-shaped connecting band is, in this species, drawn forwards, disclosing the cavity behind. In the erect condition of the ears the same funnel-shaped process is drawn backwards across this square hollow cavity, which it covers, as the pitcher of *Nepenthes* is covered by the leaf forming its lid. In this position the extremity of the funnel is flattened out, and lies in the space contained between the posterior connecting band and the top of the head.

The thumb is comparatively longer than in any other species of the genus, and the wing-membrane is attached a short distance below the knee-joint.

Upper incisors separated by a very narrow interval in front; lower incisors 4.

Length: head and body 2''·8; tail 1''·7, tail free from membrane 1''·0; ear 0''·9, tragus 0''·1; forearm 1''·9; thumb 0''·5; second finger 3''·6; fourth finger 1''·8; tibia 0''·7; foot and claws 0''·4.

Hab. Malay peninsula (Johore).

Type in the collection of the Indian Museum, Calcutta.

14. NYCTINOMUS AUSTRALIS.

Molossus australis, Gray, Mag. Zool. Bot. ii. p. 501 (1838).

Ears large, but shorter than the head, their inner margins arising close together on the muzzle from distinct points of origin, as in *N. africanus*; integument forming the ear-conch rather thin; keel very deep in lower third, but short and exceedingly thin, bent upwards and backwards; margin of the conch straight or slightly concave in superior third; antitragus very large, as high as long, posterior margin straight, anterior slightly convex, narrowly rounded off above; tragus short and broad as in *N. ægyptiacus*; but its outer margin is distinctly concave about the middle, and there is an obtuse projection at its base. Upper lip with short vertical wrinkles. The mouth of a very large gular sac, larger than in any other known species of this genus, extends across the throat from a point on each side near the anterior termination of the antitragus, opening forwards as in *Taphozous*.

Wings from the distal third of the tibia. Fur moderately long; above dark reddish-brown, beneath paler; the base of the hairs on both surfaces much lighter. On the dorsal surface the wings are covered as far as a line drawn from the middle of the humerus to the distal third of the femur, also the base of the interfemoral as far as a line drawn between the knees; beneath, a narrow band of fur extends outwards behind the forearm, becoming wider in the angle between the forearm and the fifth metacarpal bone, along which it extends for half its length, and, passing over, covers the space between it and the upper third of the fourth metacarpal.

Upper incisors rather long, separated by a narrow space in the middle; lower incisors 4, bifid: first upper premolar minute, in the space between the canine and second premolar, drawn slightly inwards.

Length (of an adult ♂ specimen, the type): head and body 3''·0; tail 1''·9, tail free from membrane 1''·0; head 1''·15; ear 0''·9, tragus 0''·2 × 0''·15; forearm 2''·35; thumb 0''·35; second finger—metacarp. 2''·25, 1st ph. 0''·9, 2nd ph. 1''·2; third finger—metacarp. 2''·1, 1st ph. 0''·7, 2nd ph. 0''·55; fourth finger—metacarp. 1''·2, 1st ph. 0''·7, 2nd ph. 0''·25; tibia 0''·75; foot and claws 0''·5.

Hab. Australia; New Guinea.

Type in the collection of the British Museum.

15. NYCTINOMUS MEGALOTIS, n. sp.

Ears nearly as long as the head, projecting when laid forwards nearly one fifth of an inch beyond the muzzle; inner margins united

on the muzzle by a low band at a distance from the end of the nose equal to the length of the base of the antitragus; inner and outer margins of the ear-conch evenly convex above; ear-keel very deep and slender in lower third, where it is partly folded upwards and backwards, so as to present a flat surface externally; superior and inner margin of the conch with four minute horny projections; antitragus rather small, but separated posteriorly by a deep notch, convex, about once and a half as long as high; tragus quadrate, with a straight superior margin and projecting outer angle, inner margin straight, outer slightly concave. Extremity of the muzzle very obliquely truncate. Upper lip very expansible, with a few deep vertical grooves. No gular sac. Thumbs and feet small. Wings from the lower end of the tibiæ.

Fur dark brown above and beneath, with slightly greyish extremities; the base of the hairs whitish. The face is nearly naked; a few hairs form a fringe along the anterior margin of the upper lip beneath the nostrils. With the exception of a narrow band of very short fine hairs, which extends on the upper surface of the wing-membrane behind the forearm to the carpus, the membranes external to the humerus appear to be quite naked; along the sides of the body the fur extends as far outwards, above and beneath, as a line drawn from the middle of the humerus to the knee.

Upper incisors separated by a space in front; lower incisors 4, bifid, crowded; internal basal cusp of canine small; first upper premolar small, conical, acutely pointed, in the centre of the rather wide space between the canine and second premolar; second upper premolar with an acute internal basal cusp; first lower premolar not crowded, as broad at the base as the second, which exceeds it (as in all other species of the genus) in vertical extent.

Length (of an adult ♂): head and body 3''·0; tail 2''·1, tail free from membrane 1''·1; head 1''·15; ear 1''·0, tragus 0''·15 × 0''·1; forearm 2''·35; thumb 0''·35; second finger—metacarp. 2''·25, 1st ph. 0''·95, 2nd ph. 1''·1; third finger—metacarp. 2''·1, 1st ph. 0''·8, 2nd ph. 0''·1; fourth finger—metacarp. 1''·1, 1st ph. 0''·75, 2nd ph. 0''·2.

Hab. Surinam. Type in the collection of the British Museum.

16. NYCTINOMUS MACROTIS.

Nyctinomus macrotis, Gray, Ann. & Mag. Nat. Hist. 1839, p. 5; Gervais, Expéd. Castelnau, Zoologie, p. 62, pl. xii. figs. 1 and 1 a (skull and teeth).

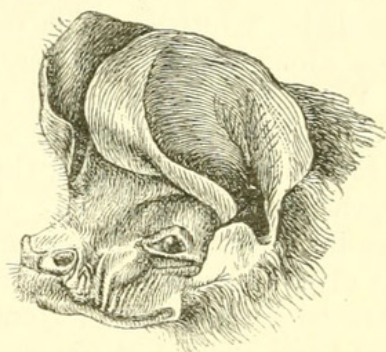
Dysopes auritus, Natt., Wagner, Wiegmann Archiv, 1843, p. 368; Burmeister, Thiere Brasiliens, p. 69 (1854).

Dysopes laticaudatus et *D. cæcus*, Rengger, Säug. Paraguay, p. 88. ? *Dysopes aurispinosus*, Peale, United-States Explor. Exped. viii. p. 21.

Ears large, nearly as long as the head, conjoined to a height of 0''·2 inch, the inner margins very convex and consequently close together for more than half their length above the band uniting their bases; integument forming the ear-conch very thin, translu-

cent; keel very deep, projecting outwards beyond the antitragus, but also very slender, curved backwards and upwards; tragus small, quadrate, superior margin straight or very slightly concave, upper half of outer margin concave, lower half forming a prominent angular projection; antitragus considerably longer than high, terminating in front between the eye and the angle of the mouth (fig. 6), separated posteriorly by a deep notch. Face deeply grooved horizontally beneath the eye, which is remarkably prominent and directed forwards. Muzzle slender, concave between the ears and the projecting, sharply cut superior margin of the nostrils; nasal apertures directed almost laterally, separated by a wide space, which is divided in the middle

Fig. 6.

Head of *N. macrotis*.

by a raised vertical ridge. Upper lip deeply furrowed by oblique wrinkles. No gular sac. Thumb rather short, with a small callosity; terminal phalanx of third finger very short. Wings from the distal third of the tibiae.

Fur short, reddish brown above and beneath; on the upper surface extending upon the wing-membrane as far outwards as a line drawn from the middle of the humerus to the knee-joint, on the base of the interfemoral, and outwards behind the forearm in a narrow band to the carpus.

Teeth slender, with very acute cusps. Lower incisors 4, crowded, bifid. First upper premolar small, but acutely pointed, in the centre of the space between the canine and the second premolar; second premolar large, with a long and very acute internal basal cusp.

Length (of the type specimen, an adult ♀): head and body 2''·8; tail 1''·9, tail free from membrane 1''·0; head 1''·1; ear 1''·0, tragus 0''·15 × 0''·1; forearm 2''·2; thumb 0''·3; second finger—metacarp. 2''·1, 1st ph. 0''·9, 2nd ph. 1''·0; third finger—metacarp. 2''·0, 1st ph. 0''·75, 2nd ph. 0''·1; fourth finger—metacarp. 1''·0, 1st ph. 0''·7, 2nd ph. 0''·3; tibia 0''·65; foot and claws 0''·4.

Hab. Cuba; Brazil (Mato Grosso); Paraguay.

The next species, *N. gracilis*, resembles *N. macrotis* very closely in general structure, and forms with it a separate section of the genus, distinguished by the peculiar shape of the muzzle.

17. NYCTINOMUS GRACILIS.

Dysopes gracilis, Natt., Wagner, Wieg. Archiv, 1843, p. 368 ; Suppl. Schreb. Säugeth. v. p. 708 (1855).

Nyctinomus gracilis, Peters, Monatsb. Akad. Berl. 1865, p. 573.

Ears conjoined by the bases of their inner margins only ; general form of the ear-conch quite similar to that of *N. macrotis* ; but the antitragus is higher than long, separated posteriorly by a very deep notch, and terminating abruptly in front near the angle of the mouth ; tragus very small, quadrate, outer margin concave. Muzzle and remaining parts of the body as in *N. macrotis*. No gular sac. Fur short, dark brown above and beneath, extending upon the wing-membranes along the sides of the body only.

Length (of an adult ♂ specimen) : head and body 2".5 ; tail 1".5, tail free from membrane 0".7 ; head 0".9 ; ear 0".75, tragus 0".1 × 0".08 ; forearm 1".8 ; thumb 0".3 ; second finger—metacarp. 1".7, 1st ph. 0".75, 2nd ph. 0".9 ; third finger—metacarp. 1".65, 1st ph. 0".65, 2nd ph. 0".1 ; fourth finger—metacarp. 1".0, 1st ph. 0".5, 2nd ph. 0".15 ; tibia 0".5 ; foot and claws 0".35.

Hab. Brazil (Mato Grosso) ; Guatemala.

Although much smaller and with comparatively shorter ears, this species resembles *N. macrotis* so closely in its general structure that, at first sight, it appears to be a small variety of that species. On closer examination, however, it is easily distinguished by the very different form of the antitragus, and by the short connexion of the ears in front.

18. NYCTINOMUS BRASILIENSIS.

Nyctinomus brasiliensis, Is. Geoffroy, Ann. des Sci. Nat. i. p. 337 (1824) ; Gervais, Expédit. de Castlenau, Zoologie, p. 60, pl. xii. figs. 2 and 2 a (teeth), 1855 ; Peters, Monatsb. Akad. Berl. 1865, p. 573.

Nycticejus cynocephala, Le Conte, Cuv. Anim. Kingd. (M^e Murtrie ed.) (1831), p. 431.

Dysopes nasutus, Temminck, Monogr. Mamm. i. p. 234 (1835).

Nyctinomus multispinosus (Peale), Burmeister (*vide* Peters, *l. c.* 1865, p. 573).

Molossus cynocephalus et fuliginosus, Cooper, Ann. New-York Lyc. iv. 1837, pp. 65, 67.

Rhinopoma carolinense, Gundlach, *nec* Geoffroy, Wieg. Archiv, 1840, p. 358.

Dysopes naso, Wagner, Suppl. Schreb. Säugeth. i. p. 475 (1844) ; v. p. 707 (1855).

Nyctinomus mexicanus, Saussure, Rev. et Mag. Zool. 1860, p. 283.

Molossus aztecus, Saussure, *l. c.* p. 285*.

Nyctinomus musculus, Gundlach, Monatsb. Akad. Berl. 1861, p. 149.

Nyctinomus nasutus, Tomes, P. Z. S. 1861, p. 68 ; Allen, Monograph of the Bats of North America, p. 7 (1864).

Ears nearly as long as the head, laid forward they extend almost

* Prof. Peters informs me that *Molossus aztecus*, Saussure, included by him in his subgenus *Molossops* (= *Myopterus*), is really a synonym of *N. brasiliensis*, as he has since ascertained by direct examination of the type.

to the end of the nose; inner margins not united, but arising close together from the muzzle about midway between a line drawn between the eyes and the extremity of the nose; inner and outer margins of the ear-conch almost regularly convex, continuous; the inner margin with five or six minute horny projections; antitragus but slightly developed, separated posteriorly by a shallow and small notch; tragus quadrate, larger than in *N. gracilis*. Upper lip with numerous vertical wrinkles; muzzle in front of the origin of the inner margins of the ears flat, terminated by the sharply cut margins of the nostrils. No gular sac.

Wings from the distal third of the tibiæ near the ankles. Fur moderately long and very dense, extending upon the wings above and beneath as far outwards as a line drawn from the middle of the humerus to the knee, the remainder naked. Lower incisors six, crowded; the outer incisors very slender, overlapping the external margin of the middle incisors, the internal margins of which are also overlapped by the central incisors; first upper premolar small, with an acute cusp well elevated above the gum in the centre of the small space between the canine and second premolar.

Length (of an adult ♀): head and body 2''·25; tail 1''·4, tail free from membrane 0''·8; head 0''·8; ear 0''·7, tragus 0''·15 × 0''·12; forearm 1''·7; thumb 0''·3; second finger—metacarp. 1''·65, 1st ph. 0''·65, 2nd ph. 0''·8; third finger—metacarp. 0''·65, 1st ph. 0''·55, 2nd ph. 0''·45; fourth finger—metacarp. 0''·8; 1st ph. 0''·5, 2nd ph. 0''·25; tibia 0''·5; foot and claws 0''·33.

Hab. The warmer regions of North and South America and their islands, extending from California to Chili; apparently everywhere distributed throughout the tropical and subtropical parts of America, where it is probably the most common species of the genus, as it has the widest range.

19. NYCTINOMUS NORFOLCENSIS.

Molossus norfolcensis, Gray, Ann. Nat. Hist. iv. p. 7 (1839).

Nyctinomus planiceps, Peters, Monatsb. Akad. Berl. 1866, p. 22.

Molossus wilcoxi, Krefft, List of Australian Bats (1871).

Ears triangular, shorter than the head, separate, their inner margins arising from distinct points of origin; inner margin of the conch almost straight, tip broadly rounded off, outer margin straight; antitragus scarcely distinguishable from the outer margin, a small almost imperceptible shallow notch indicating its commencement; tragus triangular, rounded off above. Muzzle flat, obtuse; the upper lip with shallow vertical wrinkles; nostrils opening sublaterally. Gular sac small, aperture circular, directed downwards; quite rudimentary in female. Wings from the ankles; the outer and inner toes equally enlarged.

Fur reddish brown above, paler beneath; base of the hairs much lighter. Above, a broad band of very short fur covers the wings behind the proximal four fifths of the forearm, but does not extend to the carpus.

Upper incisors long, widely separated at their bases, converging

inwards and forwards; a blunt projection from the cingulum of each posteriorly. First upper premolar small, but much larger than in the other species of the genus, filling up the space between the canine and second premolar. Lower incisors six, deeply bifid; first lower premolar small and acutely pointed, its inner side partly covered by the expanded cingulum of the second premolar, as in *M. rufus*; second premolar double the size of the first, its cingulum directed obliquely forwards and upwards.

Length (of an adult ♀): head and body 2''·1; tail 1''·25, tail free from membrane 0''·6; head 0''·8; ear 0''·6, tragus 0''·15 × 0''·1; forearm 1''·35; thumb 0''·26; second finger—metacarp. 1''·3, 1st ph. 0''·55, 2nd ph. 0''·7; third finger—metacarp. 1''·25, 1st ph. 0''·45, 2nd ph. 0''·4; fourth finger—metacarp. 0''·9, 1st ph. 0''·35, 2nd ph. 0''·15; tibia 0''·4; foot and claws 0''·3.

Hab. Australia (New South Wales, Queensland); Norfolk Island.

Inc. $\frac{2}{6}$; *Pm.* $\frac{1-1}{2-2}$. *Ears separate, tragus triangular.*

(Subgen. MORMOPTERUS, Peters.)

20. NYCTINOMUS ALBIVENTER, n. sp.

Ears triangular, shorter than the head, inner margins arising from distinct points of origin from the forehead; inner margin of the ear-conch almost straight, slightly concave in upper third, tip rounded off, outer margin straight; antitragus scarcely defined, separated posteriorly by a very shallow notch; tragus nearly as broad opposite the base of its inner margin as high, irregularly triangular, rounded off above, very similar in shape to that of *N. norfolcensis*, but less triangular and broader above, an obtuse projection about the middle of its outer margin. Extremity of the muzzle projecting very much beyond the mandible, the end of the nose very prominent and distinct from the upper lip, nostrils opening almost laterally. Sides of the upper lip with vertical grooves not well defined. Gular sac small.

Wings from the lower third of the tibiæ or from the ankles; fifth toe somewhat smaller than the first.

Dentition similar to that of *N. acetabulosus* (to be described), but the lower incisors are not crowded.

Fur, above, white at the base, the remaining part dark brown; beneath, the greater part of the chest and abdomen dirty white, the sides brown. Wing- and interfemoral membrane nearly naked; a narrow band of fur extends outwards behind the forearm and along the proximal third of the fifth metacarpal bone.

Length (of an adult ♀, the type): head and body 2''·2; tail 1''·25, tail free from membrane 0''·7; head 0''·85; ear 0''·65, tragus 0''·15; forearm 1''·45; thumb 0''·35; second finger—metacarp. 1''·4, 1st ph. 0''·55, 2nd ph. 0''·7; third finger—metacarp. 1''·4, 1st ph. 0''·5, 2nd ph. 0''·35; fourth finger—metacarp. 0''·9, 1st ph. 0''·35, 2nd ph. 0''·15; tibia 0''·4; foot and claws 0''·3.

Hab. Madagascar.

Type in the British Museum.

21. NYCTINOMUS ACETABULOSUS.

Molossus acetabulosus, Commerson, MS. *Vide* Peters, Monatsb. Akad. Berl. 1869, p. 402.

Nyctinomus acetabulosus, Desmarest, Mammalogie, p. 117 (1820).

Nyctinomus natalensis, Smith, Zoolog. S. Africa, pl. 49.

Nyctinomus (Mormopterus) jugularis, Peters, P. Z. S. 1865, p. 468.

Ears quite separate, arising from the sides of the forehead at a short distance above and in front of the eye; the inner margin of the ear-conch slightly convex for two thirds its length, abruptly *concave* in upper third, so that the upper extremity of the ear is attenuated, and the subacute tip projects forwards and inwards, instead of backwards and outwards, as in most species of Bats; outer margin of the conch forming almost a straight line from the tip to its termination near the angle of the mouth, interrupted only by a slight emargination opposite the middle of the tragus, indicating the commencement of the antitragus; tragus nearly as broad as high, irregularly triangular, with a truncated vertical angle. Muzzle flat, extremity projecting considerably beyond the lower lip; sides of the upper lip with short ill-defined vertical wrinkles. In the male a large glandular sac in the centre of the inferior surface of the neck, in the female rudimentary.

Wings from the distal third of the tibiæ; the fifth toe not so much thickened as the first.

Fur dark reddish brown above, somewhat paler beneath. Upper incisors separate from the canines and also from each other; lower incisors small, slender, bifid, crowded; the second incisor on each side slightly overlapped by the margins of the first and third; canines without basal cusps; the single upper premolar separated by a narrow interval from the canine, with a projecting base internally, which is concave behind and anteriorly develops an acute cusp; first lower premolar unicuspidate, equal to three fourths the second in vertical extent.

Length (of an adult ♂): head and body 1''·9; tail 1''·7, tail free from membrane 0''·6; head 0''·75; ear 0''·6, tragus 0''·15; forearm 1''·55; thumb 0''·25; second finger—metacarp. 1''·5, 1st ph. 0''·6, 2nd ph. 0''·7; third finger—metacarp. 1''·5, 1st ph. 0''·5, 2nd ph. 0''·4; fourth finger—metacarp. 1''·15, 1st ph. 0''·4, 2nd ph. 0''·2; tibia 0''·4; foot and claws 0''·35.

Hab. S.E. Africa (Natal); Madagascar; Bourbon; Mauritius.

The three last-described species, *N. norfolcensis*, *N. albiENTER*, and *N. acetabulosus*, differ from all the other species of the genus in the relative lengths of the metacarpal bones of the second and fourth fingers, resembling rather, in this respect, the species of the subgenus *Myopterus* (gen. *Molossus*). In all other species of *Nyctinomus* the metacarpal bone of the second finger is double the length of that of the fourth; in these three species, and in *Myopterus*, it is but one half longer. These species also agree together in the form of the tragus (in which they also differ from all other



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