

MAGAZINE
OF
ZOOLOGY AND BOTANY.

ORIGINAL COMMUNICATIONS.

I.—*A Revision of the Genera of Bats (Vespertilionidæ), and the Description of some new Genera and Species.* By JOHN EDWARD GRAY, F. R. S., President of the Botanical Society of London, &c. &c.

SOME of the older authors placed these animals with the Birds, but Ray (*Syn. Anim. Quad.*, p. 43,) properly arranged them with the Mammalia, and formed them into a particular group, of which he only knew a single species; Linnæus divided the few species he knew into two genera, which, on account of the difference in the number of their teeth, he placed in two different orders, an error which he was not often guilty of committing, and which Pennant, Pallas, and Brisson corrected, by referring them back to a single genus; but the latter author (*Le Règne Animal*, 4to,) in 1762, divided in his specific characters, the fruit-eating bats from the insectivorous ones, by the number of their claws; and this group was long afterwards converted into a genus by Geoffroy, under the name of *Pteropus*; Daubenton in 1759 (*Mem. Acad. Paris*,) described several new species, and gave some figures of the heads of these animals, which greatly facilitated their determination. Pallas, in 1767, (*Spic. Zoolog.* 6,) when describing many new species, showed that the bats might be divided into sections by the number of their teeth; and Erxleben (*Sys. Anim.*) 1777, acting on Pallas's suggestions, divided the bats into two genera, giving to those that have four cutting teeth in the upper and lower jaw the name of *Pteropus*, and retained in the genus *Vespertilio* the other bats; which he divided into sections according

to the absence, presence, and number of these appendages. These divisions were adopted by Gmelin (*Syst. Nat.* 1. 45.), who reduced the genus established by Erxleben to the rank of a section. In 1805, M. Geoffroy St Hilaire, who was then employed in naming the Mammalia in the Paris collection, commenced a series of papers in the *Annales du Museum*, in which he established various genera of these animals, described the different species which he referred to them, and illustrated them with figures. Cuvier in 1817 (*Règne Animal*,) placed the bats with the insectivorous Mammalia, and divided the insectivorous genera into groups according to the number of the phalanges of the index and middle finger; and his system has been very generally followed, and from time to time new genera have been added by Dr Horsfield, F. Cuvier, Charles Bonaparte, and others. Dr Leach, in 1822, (*Linn. Trans.* xiii.) published two papers, in which he described and figured some new genera. One of the papers is on those "bats with foliaceous appendages to the nose;" and the other for those that were without these organs. In 1823, Spix, in his work on the South American monkeys and bats, adopted these divisions, and gave a Latin name to them, and he has been generally quoted as the founder of these sections. Such was the state of the science when, in 1826, I published a short paper in the *Annals of Philosophy*; and in 1829 a second in the *Zoological Journal* (p. 242,) in which I divided the bats into five natural sections; and in the *Philosophical Magazine* for the same year I printed a revision of the genera from personal examination, and added to it an artificial table, for the purpose of facilitating the discovery of them. This paper was translated into Latin by Dr Fischer (*Synop. Mamm.* 659,) and into German by Oken in the *Isis*, and into French by Lesson in his *Manuel*; and the arrangement has been adopted by Mr Swainson in *Lardner's Encyclopædia*; and, lastly, by the anonymous writer on bats in the *Penny Encyclopædia*, who, having merely translated the article from Lesson's *Manuel*, erroneously attributes it to that author, though Lesson quotes me as the author of the tribes. The accompanying paper may be considered as an abridgement of a further revision and extension of that article; and for the purpose of writing it, I have examined all the bats which have passed through my hands, or that I have been able to see in the English collections and in the Government museums of France, Germany, and Holland; and I hope, that I shall not now hear persons complain of the difficulty they experience in making out the species, much less the genera of these interesting animals. I believe that the real cause of the difficulty is the little attention that zoologists have paid to them, and, as a proof of this inattention, I am induced to give a sketch of the history of

the discovery of the various species which inhabit this country. Ray and Merret, as I have before observed, only knew a single species, and this was the only one recognized as British, until the year 1738, when Albin first figured (Birds, t. 101.), and 1766, George Edwards again figured the long-eared bat in his work on Birds (t. 201. f. 3.); and Pennant recorded these two in his first edition of the British Zoology. In his succeeding editions he extended the number to 4, adding the *Noctule* on the authority of the Rev. Dr Buckworth, who had observed a large bat, which Pennant thought to be this species, (Brit. Zool. Illust. 1770-85,) at Queen's College, Cambridge; but the Rev. Gilbert White had written to him, and given him a good history of this bat in 1769, (Hist. Selborn, 1779, 75, 76,) and secondly, the horse-shoe bat, *Rhinolophus ferrum equinum*, which had been discovered by Mr (afterwards Dr) Latham at Dartford. In 1806 (Ann. Mus. viii. 198,) M. Adolphe Brongniart, when travelling from Dover to London, discovered a new species which was described under the name of *V. emarginatus*; and, in 1808, Montagu in the Linnæan Transactions (i. 71,) added to those already known, the little horse-shoe (*Rhinolophus hipposideros*), and the barbastelle (*Vesp. Barbastellus*;) but it is doubtful if the animal described by Montagu was the real barbastelle, for the remains of the specimen so named in his collection, was certainly *Vesp. mystacinus* of Kuhl, but the fact of the *Barbastelle* being British was fully established in 1805, by the figure of it given by Mr Sowerby in his British Miscellany, from a specimen found by Mr Peate at Dartford.

In 1825, Dr Leach described and figured in the Zoological Journal, (7, t. 22.) what he considered as a new species, under the name of *Vespertilio pygmeus*, sending the specimen described to the British Museum. In 1826, feeling from the experience that I had gained when studying with that great reformer of zoology in England Dr Leach, that the British bats had not had the attention paid to them that they deserved, I examined the various specimens collected by Dr Leach, myself, and our correspondents, which were then in the British Museum, and in the Zoological Journal (p. 108) for that year, I gave a list of the specimens then in the collection, and by that means added the four following species, viz. *Vespertilio Bechsteinii*, *V. Nattereri*, *V. serotinus*, and *V. mystacinus*. Dr Fleming having overlooked my paper in 1828, when his work on British Animals appeared, merely gave the species that were known before its publication; while the Rev. Leonard Jenyns and Mr Bell, in their works on the British Mammalia, have been able to add two more species to the list, viz. *V. Leisleri* and *V. discolor*, which I had added to the mu-

seum collection since the publication of my paper, the latter of them having been sent from Plymouth by Dr Leach. In 1833, Mr Leonard Jenyns (Lin. Trans. xvi. 55, t. 1, f. 2.) described what he considered as a species under the name of *Plecotus brevimanus*; but from the observations which I have been enabled to make on the development of the wings of these animals, (Phil. Mag. and Annals, vi. 1829-35,) which do not gain their full size until after the animal has done suckling, I am now certain that both the *Vesp. pygmeus* and *Plecotus brevimanus* are only the young states of other species, the latter being the young of the long-eared bat, and the former most probably the young of the pipistrelle; and I am borne out in this opinion by the soft state of the cranium, the large size of the joint arising from the epiphysis of the bones not being knit, of the specimen of both these animals which have come under my notice, and I may observe, that the first joint of the middle-finger of all the adult bats I have examined is as long as the arm-bone, which is not the case in these animals.

Fam. V. VESPERTILIONIDÆ.

The limbs elongated; fingers of the fore-hands and tail enclosed in a nearly naked membrane, serving for wings; fingers very long; thumb free, clawed; toes of hind-feet short, equal clawed; teeth variable.

A. ISTIOPHORI, or *Leafnose bats*. Nostrils placed in a bald space, often elevated behind into a leaf; teeth acutely tubercular; index-finger not clawed.

TRIBE I. *Leafnose kind*. PHYLLOSTOMINA.

Nose-leaf expanded into a leaf behind, simple and pierced with the nostrils in front; ears lateral, separate.

† Forehead pitted; ears close together. Old World.

1. RHINOPOMA, Geoff. Tail long, exerted beyond the short interfemoral membrane; forehead with a deep pit; ears close together; nose-leaf small.

Indian Rhinopome. *Rhinopoma Hardwickii*, Gray. Zool. Misc. 37. Inhabits India. Gen. Hardwicke.

Egyptian Rhinopome, *Rhinopoma microphylla*, Geoff. *Vesp. microphyllus*, Schreb. Brunnich, Cat. Copenh. t. 6, f. 1-4. Inhabits Egypt. Dr Rüppell.

See also *Rhinopoma Carolinensis*, Geoff. if a true Rhinopome?

†† Forehead simple, ears lateral, tongue short, under lip entire with a triangular smooth space in front. New World.

2. ARCTIBEUS, Leach.—Phyllostoma, Spix.—Tail round (none?) interfemoral membrane deeply cut in, forehead simple, ears far apart, lateral, nose-leaf simple lanceolate.

* *The inner edge of the lips not fringed.*

Jamaica *Arctibeus*. *Arctibeus Jamaicensis*, *Leach*.—*Phyllostoma Jamaicensis*, *Horsf.* Zool. Journ. ; young, *Madateus Lewisii*, *Leach*.—Tragus with 1 or 2 lobes on the middle of its hinder edge. Inhabits Jamaica, Cuba, Mr Redman.

See also *Arctibeus planirostris*. *Phyllostoma planirostre*, *Spix*, Braz. t. 36, f. 1. "Tragus lobed," *Spix*.

Fringed-lipped *Arctibeus*. *Arctibeus fimbriatus*, *Gray*.—Nose-leaf elongate, lanceolate, apex with a broad midrib ; fur mouse-colour, very soft, with pale tips, rather paler beneath than above ; fore-arm and under side of the wing near the fore-arm and side of the body with scattered fur ; the front of the lower lip with a semi-ovate space, with a central tubercle surrounded by small warts. Expanse 17". Inhabits Brazil.

Sooty *Arctibeus*. *Arctibeus fuliginosus*, *Gray*.—Fur sooty-black ; wings and membrane black ; chin with a triangular space, having 5 or 6 warts on each side ; nose-leaf ovate-lanceolate, acute, with a deep groove parallel to the edge of each side, front part free on the edge ; lips fringed ; ears moderate, rather naked, black. Expanse 16" ; body and head 3", arm-bones 2" 6". Inhabits S. America. Museum Lyons.

See also *Arctibeus lineatus*, *Gray*.—*Phyllostomus lineatus*, *Illiger*, Licht Doub. 3, Phyll. lineatum, *Geoff*.

* * *Lips not bearded internally.*

Lobed *Arctibeus*. *Arctibeus lobatus*, *Gray*.—Tragus 3 lobed. Inhabits—? British Museum.

Arctibeus perspicillatus.—*Phyllostoma perspicillatum*, *Geoff*. Ann. Mus. xv. t. ii. P. superciliarum, *Pr. Max.* P. lineatum, *Geoff*. ? *Vesp. perspicillatus*, *Linn.* Grande fer de lance, *Buffon*, Suppl. vii. t. 74, cop. *Encycl. Meth.* t. 32, f. 4. *Phyllostomus lituratus*, *Illig.* Licht. Phyll. lineatus, *Illiger*. Collection of Mr Swainson.

3. *VAMPYRUS*, *Geoff*. Vampire.—Tail none, interfemoral membrane large, with 3 diverging lines, truncated at the end ; muzzle long ; central upper cutting teeth lobed.

Pale Vampire. *Vampyrus spectrum*, *Leach*.—*Phyllostoma spectrum*, *Geoff*. Ann. Mus. xv. t. ii. f. 4 ; head and skull. Diet de Sc. Nat. *Vesp. spectrum*, *Linn.* *Seba*, i. t. 58, f. 1, cop. *Schreb.* t. 54, *Shaw*, t. 43. *Vampyrus sanguisuga*, *Lesson* ; front of lower lip with 2 small smooth warts in front. Inhabits Brazils. British Museum.

4. *PHYLLOSTOMA*, *Geoff*. Phyllostome. *Vampyrus*, *Spix*. Tail very short, on the upper side of the interfemoral membrane tips.

* *Front of the lower lip with a triangular space, having a large wart on each side and a series on the edge.*

Javelin Phyllostome. *Phyllostoma hastatum*, Geoff. Ann. Mus. xv. t. ii. *Phyllostomus maximus*, Pr. Max. Abbild. t. 71. *Vesp. hastatus*, Pall. Le Chauve-souris fer de lance, Buff. H.N. xiii. t. 33, cop. Schreb. t. 46. Encyc. Meth. t. 30. f. 4. *Vesp. perspicillatus*, Schreb. t. 46, a. *Pteropus hastatus*, Erxleb. Javelin Bat, Penn, t. 30, fig. 4. Variable in colour, hair brown, tip with gray. 1. male, fulvous brown; 2. female, brown; 3. male, blackish. Inhabits Brazil. British Museum.

See also *Phyllostoma elongatum*, Geoff. Ann. Mus. xv. t. 6. f.—*Phyllostoma crenulatum*, Geoff. Ann. Mus. xv. t. 6, f. Desm. Nouv. Dict. xxvi. t. m. 28, f. 3. Encyc. Meth. t. 3, f. 10. Inhabits —?

Sooty Phyllostome. *Phyllostoma fuliginosum*, Gray.—Sooty-black, hair of head and neck with greyish tips, beneath greyer; nose-leaf ovate-lanceolate, quite entire, $1\frac{1}{2}$ as long again as broad; ears sharp; wings black; tail end free. Inhabits S. America. British Museum. From Sir Everard Home.

* * *Lower lip with an half ovate group of crowded warts.*

Children's Phyllostome. *Phyllostoma Childreni*, Gray.—Brown, slightly grizzled, with grey tips to the hairs, beneath greyer; ears large with rather membranaceous rounded at the ends; nose-leaf ovate-lanceolate, rather longer than wide; wings brown; warts of lower lip in 3 or 4 arched series, crowded. Expanse 12". Inhabits S. America. British Museum. From J. G. Children, Esq.

* * * *Front of lower lip with a small smooth ovate space formed of two small tubercles, as in Vampyrus.*

Bennett's Phyllostome. *Phyllostoma Bennettii*, Gray.—Fulvous brown, rather paler beneath; hair very long, soft, with greenish tips; ears very large, rather acute; nose-leaf very large, ovate-lanceolate, with a thick convex midrib; wings brown. Exp. 12"; nose-leaf 8". Inhabits S. America. British Museum. Named in memory of my excellent friend, whose early death all zoologists must deplore.

* * * * *Front of the lower lip with a large central wart, having a series of large oblong transverse warts on the edge, the upper warts sometimes divided into 2 or 3.*

Soricine Phyllostome. *Phyllostoma soricinum*, Fischer. *Vampyrus soricinus*, Spix, Braz. t. 36, f. 2–6. Inhabits Brazils.

5. CAROLLIA. Interfemoral membrane large, truncated; tail none; tragus very small.

Brazilian short-eared bat. *Carollia Braziliensis*. *Phyllostoma brachyotum*, Pr. Max. t. f. 1–2. Inhabits Brazils.

6. *LOPHOSTOMA*, *Orb.* Interfemoral membrane large, truncated ; tail rudimentary ; tragus entire.

Lophostoma sylvicola, *Orbigny*, *Voy. Amer. Merid.* t. 6. Inhabits S. America. Perhaps the same as the former.

7. *EDOSTOMA*, *Orbigny*. Edostome. Tail none ; interfemoral membrane very small, marginal ; heel-bone none ; nose-leaf double, erect, anterior pierced with the nostrils, hinder erect, larger, separated from the front one by a considerable space.

Ashy Edostome. *Edostoma cinerea*, *Orbigny*, *Voy. Amer. Merid.*, t. 8.

8. *MACROPHYLLUM*, *Gray*. Macrophyllle. Tail elongated, reaching to the truncated tip of the large interfemoral membrane, under lips —?

Prince Nieuwied's Macrophyllle. *Macrophyllum Nieuwiedii*, *Gray*. *Phyllostoma macrophyllum*, *Pr. Max. Abbild.* t. Inhabits Brazil.

9. *BRACHYPHYLLA*, *Gray*. Cavern Bat. Tail very short, interfemoral membrane deeply nicked, two rayed ; nose-leaf small, surrounded by a deep groove, which separates it from the face ; front of under lip with a smooth triangular space bearded on the edge.

Cavern Bat. *Brachyphylla cavernarum*, *Gray*, *Proc. Zool. Soc.* ii. 123. Inhabits St Vincents (West Indies.) *Brit. Mus.* and *Zool. Soc. Mus.*

10. *DIPHYLLA*, *Spix*. Tail none ; interfemoral membrane none ; nose-leaf double, one being placed behind the other ; tragus lanceolate ; under lip —?

Diphylla ecaudata, *Spix*, *Braz.* t. 36, f. 7. *Glossophaga diphylla*, *Fischer*. Inhabits Brazils.

11. *STENODERMA*, *Geoff.* *Desmodus*, *Pr. Max.* ? Tail and interfemoral membrane none ; nose-leaf very small, scarcely elevated ; nostrils with an arched ridge behind ; thumb long, free ; under lip —?

Stenoderma rufum, *Geoff.* *Dict. Sc. Nat.* t. Inhabits Brazils. *Mus. Paris*, (bad state.) Is the *Desmodus rufus*, *Pr. Max. Abbild.* t. *Rhinolophus ecaudatus*, *Schinz.* distinct ? Temminck considers this to be a young *Dysopes* !

† † † *Forehead simple ; ears lateral ; tongue long, fitting into the notch of the chin ; lower lip deeply cut in the centre of the front, and often fringed ; head elongated ; chin with reflexed whiskers.* New World.

12. *PHYLLOPHORA*, *Gray*. Tail short ; apex enclosed in the large truncated interfemoral membrane ; apex superior.

Phyllophora amplexicaudata, Gray. *Glossophaga amplexicaudata*, Spix. Braz. t. 36, f. 4. Inhabits Brazils. British Museum.

13. *GLOSSOPHAGA*, Geoff. Tail none ; interfemoral membrane is large and deeply cut out.

Soricine Bloodsucker, *Glossophaga soricina*, Geoff. *Vespertilio soricinus*, Pall. Misc. t. 5. Spic. Zool. iii. t. 3-4, cop. Schreb. t. 47 ; and Encyc. Meth. t. 32. f. 5. Edwards' Birds, t. 201, f. 1. *Pteropus soricinus*, Erxleb. *Phyllost. soricinum*, Geoff. Ann. Mus. xv. t. 2. Leaf-bat, Pennant. Inhabits West Indies. British Museum, from Thomas Bell, Esq.

14. *MONOPHYLLUS*, Leach. Tail short, prominent above the very small deeply cut interfemoral membrane ; thumb elongated, thick ; heel-bone rather elongated ; head short,

Redmann's leaf-nose bat. *Monophyllus Redmanni*, Leach, Linn. Trans. xiii. 76. Brown, beneath rather paler ; membrane black ; lower lip fringed, and with two slight tubercles in front. Inhabits Jamaica.

Glossophaga caudifera, Geoff. Mem. Mus. iv. t. 17, cop. in Dict. Sc. Nat. ; may not be different from the former.

15. *ANOURA*, Gray. Tail-less Bat. Tail none, interfemoral membrane small, just margining the hind legs ; heel bone very short ; cutting teeth $\frac{2}{0} \div \frac{2}{0}$; thumb very small and slender.

Geoffroy's tail-less bat. *Anoura Geoffroyi*, Gray. *Glossophaga ecaudata*, Geoff. Mem. Mus. iv. t. 181. Pr. Max. Abbild. Inhabits Brazil. British Museum.

† † † † Forehead simple ; ears large, united over the forehead.

16. *MEGADERMA*, Geoff. Broad-winged bat. Nose-leaf simple, erect, front part flat, on the nose behind ; lips simple ; wings, interfemoral membranes and ears, large, membranaceous ; tail none ; cutting teeth $\frac{0}{0}$. India.

Megaderma trifolium, Geoff. Ann. Mus. xv. t. 12, head. *Megaderma spasma*, Geoff. Ann. Mus. xv. t. 12, from Vesp. spasma, Linn. from Seba, i. t. 56. f. 1. cop. Schreb. t. 48. Shaw's Zoology, t. 41. Vesp. lanceolata, Deschamp, MSS. Inhabits Java. Museum Leyden.

Lyre-nosed broad-winged bat. *Megaderma Lyra*, Geoff. Ann. Mus. xv. t. 12. cop. Encycl. Meth. t. 3. f. 11. B. Dict. Sc. Nat. Inhabits India. British Museum.

17. *LAVIA*, Gray. Nose-leaf simple, erect behind, with an expanded elevated edge in front, and a fold forming a canal in the upper edge of its centre ; lips simple ; tail none ; cutting teeth $\frac{2}{0}$. Africa.

Lavia frons, Gray. *Megaderma frons*, Geoff. Ann. Mus. xv.

t. 1, head: la Feuille, *Daubenton*, Acad. Paris, 1769. Inhabits Africa, (Egypt, Senegal, Gambia.) British Museum.

Nose-leaf large, membranaceous, hairy, the hinder part elongated, with a deep fold on each side forming a broad central tapering kind of midrib, the lower part of each fold furnished with a membranaceous expansion covering the nostrils. The front of the leaf large, with a broad expanded free edge, furnished with a fold in centre of the front, forming a conical canal.

? 18. *MORMOOPS*, *Leach*. not *F. Cuv.* Nose-leaf simple; ears large, close together in front, united to the nose-leaf above, and to the membranaceous ridges round the mouth and chin; interfemoral membrane large, truncated; tail short, inclosed; apex free above; cutting teeth $\frac{4}{4}$.

Mormoops Blainvillii, *Leach*, Linn. Trans. xiii. t. 7. Inhabits Jamaica.

The genus described by M. F. Cuvier under this name appears to be perfectly different. This genus differs from *Vampyrus* in the large ears, the mouth being fringed with membranes, wartiness of the chin, and in the under lip being entire in front.

TRIBE II.—RHINOLOPHINA.

Nose disk expanded into a leaf behind, and with a pit or process between the nostrils in front.

* *Interfemoral membranes very small; tail none; disk with a large deep pit between the nostrils.*

19. *ARITEUS*, *Gray*. *Istiophorus*, *Gray* (not *Cuv.*) Nose-leaf erect, lanceolate, simple behind, rounded in front; ears lateral; separate tragus; lanceolate-toothed; interfemoral membrane only margining the legs; heel-bone, moderate.

Yellowish *Ariteus*. *Ariteus flavescens*, *Gray*. *Istiophorus flavescens*, *Gray*. Zool. Misc. 37. Inhabits —? British Museum.

* * *Interfemoral membranes large; tail long.* (Old World.)

20. *RHINOLOPHUS* (*Noctilio*, *Bechst.*) Horse-shoe Bat. Nose-leaf thin, extended into a transverse lanceolate leaf, with 4 cells at its base, and with a toothed longitudinal crest in the middle space, between the nostrils in front, and a slight pit in its front; ears large, separate; pubes with distinct false teats. Tragus small.

Rhinolophus hipposideros, *Geoff. Leach*. Misc. t. 121. *Rh. bihastatus*, *Geoff.* Ann. Mus. xx. t. 5. *Temm.* Mon. n. *Vesp. minutus*, *Montagu*, Linn. Trans. ix. t. 18, f. 6. *Noctilio hipposideros* *Bechst.* (1801.) *V. ferrum-equinum* β *Gmel.* Petit feracheval. *Daubent. Buffon*, N.H. iii. t. 20. Inhabits Europe. Brit. Mus.

Rhinolophus ferrum-equinum, Leach, Zool. Misc. Vesp. ferrum-equinum, Schreb. t. 62, upper fig. Vesp. hippocrepis, Hermann. Noctilio ferum-equinum, Bechst. Grand fer a cheval. Daubent. Mem. Acad. Paris, 1759, t. 1. f. 4. Buffon, N.H. viii. t. 17. f. 2. *Rhinolophus unihastatus*, Geoff. Ann. Mus. xx. t. 5. Temm. Mon. No. 13. Inhabits Europe, Asia, and Africa. (Britain, Turkey, Syria.) British Museum.

Rhinolophus megaphyllus, Gray, Proc. Zool. Soc. iii. 52. Inhabits New Holland. British Museum.

See also 1. *Rhinolophus minor*, Horsf. Java, t. f. a, b, head. Temm. Mon. No. 14. 2. *Raffinis*, Horsf. Inhabits Java. Museum, India House; and 3. *Rhinolophus griseus*, Meyer. Bonn. Trans. 1824. Inhabits — ?

Rhinolophus Capensis, Licht. *Rhinolophus clivosus*, Ruppell. Atlas, t. 18. Temm. Mon. No. 15. *Rhinolophus Geoffroyi*, A. Smith, Zool. Journ. Inhabits Africa, (Egypt, Cape of Good Hope,) and Europe, (Dalmatia, Sicily,) Asia, (Levant.) British Museum.

21. *HIPPOSIDEROS*, Gray. *Phyllorhina*, Bonap. The nose disk extended into a short reflexed leaf behind, with a thick cross rib on the front of its base, to which it is attached by 3 longitudinal bands, the front part flat, simple, pierced with the nostrils. Tragus none.

a. Forehead pierced with an expansile pore; pubal teats distinct.

* Face leafy on the sides of the nose disk.

Hipposideros insignis, Gray. *Rhinolophus insignis*, Horsf. Java, head. Temm. Mon. No. 3, t. 1, f. 2. Vesp. cyclope, Desch. MSS. Ears acute, front, with a narrow and a broad hairy band; tail end not produced. Inhabits Java. Museum, India House.

Dr Horsfield's specimen of *Rhin. deformis*, (t. 7, f. 9, head,) appears to be a specimen of this species, the base of the tail of which has been drawn out when the animal was skinned.

Hipposideros apiculatus, Gray. Ears acute, front edge hairy, hinder edge plicated; last joint of the tail elongated and produced; fur soft, silky; base whitish; tips dark-brown. Inhabits India. W. Elliot, Esq. British Museum.

* * Face not leafy on the sides of the nose disk.

Hipposideros fulvus, Gray. Fur reddish fulvous; silky, rather paler beneath; ears very large, rounded, dark, with a few short scattered hairs on the outsides, and 2 or 3 lines of long hairs on the front edge; last joint of tail slightly produced. Inhabits India, (Madras.) W. Elliot, Esq. British Museum.

Mouse-coloured Horse-shoe-Bat. *Hipposideros murinus*, Gray.

Fur pale mouse-colour, hairs with brown ends, and very small white tips; whitish beneath; ears very large, rounded, with 2 or 3 lines of long hairs on the front edge; tail, last joint slightly produced. Inhabits India, (Madras.) W. Elliot, Esq. British Museum.

This difference of colour is not sexual, as Mr Elliot had male and female of each. See also *Rhinolophus armiger*, *Hodgs.* from Nepaul.

b. Forehead concave, deep, with a tuft of rigid brown hair in the front, in the place of the frontal pore; (tail destroyed;) sides of face leafy.

Pencilled Horse-shoe Bat, *Hipposideros penicillatus*, *Gray*. Brown, with a tuft of brown hair on each side over the eyes, and a small pencil of rigid brown ones on the front of the forehead. Inhabits India, (Madras.) W. Elliot, Esq.

c. Forehead simple; nose leaf entire, rounded; tail as long as the membrane; muzzle leafy on side of nose disk. (India.)

Hipposideros diadema, *Gray*. *Rhinolophus diadema*, *Geoff.* Ann. Mus. xx. t. 5. *Temm.* Mon. n. 2. Inhabits Timor.

Hipposideros nobilis, *Gray*. *Rhinoloph. nobilis*, *Horsf.* Java, Head from dry specimen, *Temm.* Mon. No. 1, t. 1, f. 1. Inhabits Java. Museum, India House.

Hipposideros larvatus, *Gray*. *Rhinolophus larvatus*, *Horsf.* Java, head. *Temm.* Mon. No. 9. Inhabits Java. Museum, India House.

Hipposideros vulgaris, *Rhinolophus vulgaris*, *Horsf.* Java, t. 7. f. E. head. Inhabits India. British Museum. Museum, India House.

See also *Rhinolophus Commersonii*, *Geoff.* Ann. Mus. xx. t. 5, head. Only known from Commerson's drawings; tail half as long as the thigh. Inhabits Madagascar. See also *R. torquatus*, *Hodgs.* of Nepal.

d. Forehead simple; nose leaf 3-toothed; tail longer than membrane; pubal teats none. Asellia.—Gray.

Three-toothed Horse-shoe Bat. *Hipposideros tridens*, *Gray*. *Rhinolophus tridens*, *Geoff.* Descrip. Egypte, t. 2, in Ann. Mus. xx. t. 5, head. Dict. Sc. Nat. *Temm.* Monog. No. 6. Cheeks with longitudinal ridges. Inhabits North Africa, (Egypt.) British Museum.

The difference in the form of the front part of the nose-leaf, on which Dr Horsfield founded part of his specific character, appears to depend on the drying of the specimens. All the specimens described by that excellent zoologist were in a dry state. I have made the foregoing references to his species after the examination of

his own specimens in the India House, and those which he sent to the British Museum as types of his species.

B. ANISTIOPHORI, or *Simple nosed bats*. Nostrils simply pierced in the end of the muzzle without any nasal leaf.

Tribe III.—VESPERTILIONINA.

Grinders acutely tubercular, wings broad, large ; tail elongated, as long as, and enclosed in, the large conical interfemoral membrane, upper cutting teeth near the canines, with a central space.

† *Ears united or approximate ; nostrils each placed in the front of a groove, the grooves are close together in front, diverging from one another behind, and are covered by their spirally convolute outer margin, which is lobed in front for the passage of the air.*

22. NYCTERIS, Geoff. Ears large, united over the forehead ; tragus distinct ; wings and interfemoral membrane large ; tail long, forked at the tip.

* *Ears united on the forehead.* Africa.

Nycteris Thebaica, Geoff. Descript. Egypte, t. 1, No 2. Ann. Mus. xx. t. 1, head. Vespert. hispidus, Schreb.? Nyct. Geoffroyii, Temm. Inhabits Africa. (Egypt and Guinea?) Brit. Mus.

Add also 1. Nycteris Capensis, A. Smith, Zool. Journ. iv. and 2. Nycteris affinis, A. Smith, Zool. Journ. iv. Inhabits Africa. (C. G. H.)

* * *Ears not united in front, forehead with a large deep oval naked concave pit, having a naked groove in front running down between the nostrils.* Asia. (Petalia, Gray.)

Nycteris Javanica, Geoff. Ann. Mus. xx. t. 1. N. Kuhlii, Temm. Vesp. polycaris, Deschamps. Inhabits Java. Mus. Ind. House.

† † *Ears united ; nostrils in the front part of a short lunate groove.*

23. NYCTOPHILUS, Leach? Temm. Barbastellus, Gray. Nose grooves united together behind by an elevated membranaceous crest, extending across the nose ; forehead bare with a central longitudinal furrow having inflexed bald edges.

Australian Nyctophile. Nyctophilus Geoffroyii, Leach. Linn. Trans. xiii. 78? Temm. Vy. (1833.) Barbastellus Pacificus, Gray. Zool. Misc. (1831) 38. Inhabits Pacific Islands. Mus. Brit. and Linn. Soc. Mus.

24. BARBASTELLUS, Gray. Nasal groove simple lunate, extending a short distance behind the nostrils ; forehead flat with an oval bald longitudinal line ; ears large, broad, subquadrate ; skull convex ; face narrow.

Common Barbastelle. *Barbastellus communis*, Gray, B. Daubentonii, *Bell.* *Plecotus barbastellus*, *Lesson.* *Vesp. barbastellus*, *Schreb.* Barbastelle, *Daubent.* Mem. Acad. Paris, 1759, t. 2. f. 8. *Buffon*, H.N. viii. t. 19, f. 1, copied, *Schreb.* t. 559, Encycl. Meth. t. 38. f. 6. *Geoffroy*, Ann. Mus. viii. t. 46. 48. Europe. Brit. Mus.

25. *PLECOTUS*, *Geoff.* Nasal groove simple, lunate ; forehead with a linear bald streak ; forehead flat ; ears and tragus very large, elongate.

Common long-eared bat, *Plecotus communis*, *Lesson.* *Plecotus auritus*, *Geoff.* *Vesp. auritus*, *Linn.* Oreillard, *Daubent.* Mem. Acad. Paris, 1759, f. 1. and 2 (head). *Buffon*. H.N. viii. t. 17. f. 1, cop. *Schreb.* t. 50, and Encycl. Meth. t. 83, f. 1. *Geoff.* Ann. Mus. viii. t. 47 head. *Edwards' Birds*, t. 201. *Penn. B. Zool.* t. 103. *Shan's Zool.* t. 40. Young, *Plecotus brevimanus*, *Jenyns*, *Linn. Trans.* xvi. t. 1, f. 2 ♀. Europe. Var. *α. Egyptiacus*, *Geoff.* *β. Austriacus*, *Desm.* Brit. Mus.

See also 1. *Plecotus cornutus*, *Lesson.* *Vesp. cornutus*, *Faber*, Isis 1826. Inhabits Jutland. 2. *P. Bonapartii*, *P. brevimanus*, *Bonap.* 3. *Plecotus Peronii*, *Isidore St Hilaire*, Mag. Zool. t. 3, f. 1. Inhabits——? 4. *Plecotus leucomelas*, *Ruppell*, Atlas t. 28 b. Inhabits N. Africa. 5. *P. Macrodis*, *Le Conte*.

Christie's long-eared bat, *Plecotus Christii*, n. s. Fur pale, hairs whitish with dusky tips ; beneath white ; spur very long ; interfemoral membrane with 11 or 12 cross lines of vessels on the back of the thigh and skin ; tragus half as long as the ears. Inhabits N. Africa. Dr Turnbull Christie. British Museum.

† † † Ears lateral, separate ; nostrils in the front of a long simple edged groove.

26. *ROMICIA*, Gray.—Nostrils small, ovate, apical ; each in the front of a converging groove, which are united behind into a groove on the centre of the nose between the swollen cheeks.

Long-spurred *Romicia*, *Romicia calcarata*, Gray.—Chin with two small warts on each side, and a large one on the front part of the throat ; fur brown with grey tips ; the tips of the hair on the under side longer and whiter, tragus elongated, oblong, blunt ; ears rounded ; wings black ; interfemoral membrane with regular muscular bands ; heel-bones very long, two-thirds the length of the margin, with a lobe on the outer edge of the base ; the other third of the margin with a strong muscular band. Inhabits ——? British Museum.

† † † † Ears lateral separate ; nostrils with only a very short nasal groove behind them.

27. *VESPERTILIO*. Head round ; forehead convex ; face small, pro-

duced, nearly covered with hair ; wings and ears thin, membranaceous ; body covered with woolly hairs ; tail long, the whole length of the interfemoral membrane, cutting-teeth $\frac{2 \cdot 2}{4}$; skull globular ; jaws produced, narrow ; eyes large, exposed.

† *Thumb moderate ; ears short.*

Vesp. mystacinus, *Leisl.* (Kuhl. l. c.) Europe. British Museum.

Vesp. Nattereri, *Kuhl. Wetter. Ann. iv. t. 2, 3, (head.)* Inhabits Europe, (London.) British Museum.

Vesp. Daubentonii, *Kuhl. Wetter. Ann. iv. t. 25, f. 1, head.* Inhabits Europe. British Museum.

Hardwicke's bat, *Vespertilio Hardwickii, Horsf.* Inhabits Java. British Museum. East India Company.

Painted bat, *Vespertilio pictus, Pallas.* *V. kerivoula, Bodd.* Inhabits Java (and Ceylon.) British Museum. East India Company.

See also 1. *V. fuliginosa, Hodgs.* 2. *V. capaccini, Bonap.* 3. *V. emarginatus, Brong.*

* * *Thumb moderate ; ears large.*

Large eared bat, *Vespertilio myotis, Bechst.*—*Vesp. murinus, Geoff. Ann. Mus. viii. t. 47 and 48, (not Linn.) Daubenton, Mem. Acad. 1759, t. 1, f. 1. Buffon, H.N. viii. t. 16, cop. Encycl. Meth. t. 38, f. 2. Jun. Vesp. murinus, Bechst. var. Vesp. submurinus, Brehm.* Inhabits S. of Europe, ("not found in Sweden," *Nilsson.*)

* * * *Thumb very long.*

Vesp. Bechsteinii, Leisl. Kuhl. Wetter, Ann. iv. t. 22, f. Inhabits Europe.

* * * * *Thumb moderate, end of tail rather produced.*

Vesp. Capensis, Smith, Zool. Journ. iv. Inhabits Cape of Good Hope. M. Jourdan.

28. *FURIA, Fr. Cuv. Furipterus, Bonap.*—Head round ; forehead compressed, convex ; face small, broad, produced, nearly covered with hair ; wings and ears thin membranaceous ; tail bony for half its length, cartilaginous at tip, cutting teeth $\frac{4}{6}$, upper acute.

Furia horrens, Fr. Cuv. Mem. Mus. xvi. t. 9. Vesp. Furia, Fischer. Inhabits S. America. Does not the peculiarity of the tail arise from the bones having been partly withdrawn when the animal was skinned ?

29. *NATALUS, Gray.* Head small ; face depressed ; nostrils apical, ovate, separated by a central ridge ; lower lip callous, grooved ; hind legs and tail very long ; the heel-bone extending the whole length of the interfemoral membrane.

Natalus stramineus. Vesp. longicaudatus, Gray, MSS. Fur pale yellow-brown ; paler beneath. Inhabits—? British Museum.

30. *MINIOPTERUS*, Bonap. 1837. Head subglobose ; forehead convex ; face short ; ears small, thick, rounded ; tragus lunate ; eyes partly hid ; feet long ; tail very long ; interfemoral membrane very large, folded on each side

Miniopterus Ursinii, Ch. Bonap. Fauna Ital. Italy, and M. Sciboldii, Japan. Museum, Leyden.

31. *SCOTOPHILUS*, Leach. *Nycticejus*, Rafin ? Horsf. *Pipistrellus*, Bonap. V. *Pachyote*, Gloger. Head oblong ; forehead flat ; face swollen on the sides, naked in front ; wings and ears thick, rather coriaceous ; body covered with short fine adpressed thick-set hairs ; cutting teeth $\frac{2}{6}^2$, when young $\frac{1}{6}^1$; when adult ; skull flat above ; forehead shelving ; eyes small, hid in the fur.

The genus *Nycticejus*, *Rafinesque*, from an old specimen, as *Scotophilus*, *Leach*, is from a young specimen of this genus ; *Nyctalus*, *Bowdich*, is only a species with ticks in its ears, and interfemoral membrane nearly bald.

Common bat. Penn. *Scotophilus murinus*, Gray. *Vespertilio Pipistrellus*, Schreb. V. *murinus*, Linn. Junior, Vesp. *pygmæus*, Leach. Zool. Journal, iii. Inhabits Europe. Colour variable. *Leach's* specimen of *V. pygmæus* is so young that the bones of the skull are neither united nor hardened, and the epiphyses are visible in all the joints.

Serotine *Scotophile*, *Scotophilus serotinus*, Gray. Vesp. *Serotinus*, Schreb. V. *noctula*, Geoff. Ann. Mus. viii. t. 47, 48 head. Le Serotine, Daubenton, Acad. Par. 1759, t. 2, f. 2. Buffon, HN. viii. t. 18, f. 2. cop. Schreb. t. 53, and Encycl. Meth. t. 23, f. 4. Serotine bat, Penn. Inhabits Europe.

Scotophilus Noctula, Gray. Vesp. *Noctula*, Schreb. t. 52. Fr. Cuv. Mam. Lith.—var. *Sumatrana*, Fr. Cuv. Inhabits Europe. Brit. Mus.

Scotophilus Kuhlii, Gray. Vesp. *Kuhlii*, Natterer. Kuhl. l. c. Inhabits Europe.

Scotophilus Leisleri, Gray. Vesp. *Leisleri*, Kuhl. V. *dasycarpus*, Leisl. MSS. Inhabits Europe.

Scotophilus discolor, Gray. Vesp. *discolor*, Kuhl. Wett. Annal. iv. t. 25, f. 2. Inhabits Europe (Bucharina.)

Scotophilus Schreibersii, Gray. Vesp. *Schreibersii*, Kuhl. Inhabits Europe.

Scotophilus Leachii, Gray. *Scotophilus*. *Kuhlii*, Leach, Linn. Trans. xiii. 72. (Young) male chesnut, female brown. Inhabits — ? British Museum.

Scotophilus Temminckii, Gray. Vesp. *Temminckii*, Horsf.

(Young) *Vesp. Belangeri*, *Isid. Geoff.* *Belanger*, *Voy. adult.* Inhabits India. E. India Company.

Scotophilus castaneus, *Gray.* *Vesp. castaneus*, *Gray.* *Illustr. Ind. Zool.* Inhabits India. General Hardwicke.

Scotophilus Heathii, *Gray.* *Nycticejus Heathii*, *Horsf.* *Proc. Zool. Soc.* 114. Inhabits India, (Madras.) *Mus. Zool. Soc.* Probably only a variety of *Scotophilus Leachii*?

Scotophilus Javanicus, *Gray.* *Vesp. Javanica*, *Fr. Cuv.* *Nouv. Ann. Mus.* 1. 21. Inhabits Java.

Scotophilus Coromandra, *Gray.*—*Vesp. Coromandra*, *Fr. Cuv.* *Nouv. Ann. Mus.* i. 21. Inhabits India. *Vesp. formosa*, *Hodgs.* Inhabits Nepaul. (If it is not *Scot. Leachii*, *Leach.*)

See also 1. *Vesp. Alcitoë*; 2. *V. Leucippe*; 3. *V. Aristippe*; 4. *V. Savi*, and 5. *V. Vispistrellus*, *Bonap.*; *Fauna Ital.*

** *Upper surface of interfemoral membrane slightly covered with hair.*
(*Pachyotus.*)

† *Face villose.*

Scotophilus polythrix. *Vesp. polythrix*, *Isid. Geoff.* *Ann. Sc. Nat.* iii. 443.

† † *Face partly bald.*

Scotophilus lævis, *Isid. Geoff.* *Ann. Sc. Nat.* iii. 443.

* * *Upper surface of interfemoral membrane covered with close hairs*
Lasiurus—Atalapha, Rafin.?

Scotophilus pruinus. *Vesp. pruinus*, *Say*, *Long's Exp.* 167. Inhabits N. America, (River Missouri.) British Museum.

Scotophilus lasiurus, *Gray.*—*Vesp. lasiurus*, *Schreb.* t. 62, B. cop. *Encyc. Meth.* t. 31, f. 4, *Geoff.* *Ann. Mus.* viii. t. 47, head. Inhabits Cayenne.

Scotophilus Blosssevillii. *Vesp. Bonariensis*, *Voy. Coquille*, t. 2, f. 1. *Vesp. Blosssevillii*, *Lesson*, *Bull. Sc. Nat.* viii. 95. Inhabits S. America (La Plata.)

See also, *Scotophilus Noveboracensis.* New York bat, *Penn. Syn.* t. 31, f. 2, cop. *Encyc. Meth.* t. 34, f. 5. *Atalapha Americana*, *Rafin.* *Vesp. Noveboracensis*, *Erxleb.* Doubtless belong to this section, but want further examination.

TRIBE IV. NOCTILIONINA.

Grinders acutely tubercular; wings long and narrow; body thin; tail thick.

* *Tail short, tip on the upper surface of the large interfemoral membrane.*

32. *TAPHOZOUS*, *Geoff.* *Saccopteryx*, *Illiger.* Head conical, de-

pressed; forehead with a large pit; cutting-teeth, $\frac{0}{4}$; throat of males with a transverse slit. Inhabits Old World.

Taphozous perforatus, Geoff. Descript. Egypte, t. 3. f. 1. Dict. Hist. Nat. t. T. Senegalensis, Geoff. (dry?) from Lerot Volant, Daubenton. Tail rather longly produced. Inhabits Africa, Egypt. British Museum.

Taphozous lepturus, Geoff. *Saccopteryx lepturus*, Illiger, from Vesp. lepturus, Schreb. t. 57. Vesp. marsupialis, Müller, Naturf. 19. Said to come from Surinam; scarcely appears to differ from the former.

Taphozous nudiventer, Rüppell. Atlas, t. 27. Inhabits Africa (Nubia) Dr Rüppell. British Museum.

Taphozous rufus, Harlan, from the Red bat, Wilson. (Am. Orn. vi. t. 50. f. 4.) is a *Scotophilus* from the manner in which it bends its tail, perhaps *Scot. pruniosus*.

33. *NOCTILIO*, Linn. *Celaeno*, Leach. Head conical; forehead flat; muzzle acute warty; lips dependent; cutting-teeth, $\frac{4}{2}$ young, $\frac{2}{2}$ adult. America.

The genus *Celaeno* of Leach is only a specimen in which the bones of the tail have been withdrawn out of the skin. The original specimen is in the museum of the University College, London.

Noctilio Americanus, Linn. *N. unicolor*, Pr. Max. Vesp. leporinus, Linn., Schreb. t. 60. Seba, t. 55, f. 1. Peruvian Bat, Penn. Inhabits South America.

Noctilio mastivus. Vesp. mastivus, Vahl. Selsk. Skriv. iv. t. 132, f. 7. (1797.) *Noctilio dorsatus*, Pr. Max. Beitr. *N. vittatus*, Pr. Max. Abbild. t. *Pteropus leporinus*, Erxleb. Jun. *N. albiventer*, Spix, Braz. t. 36. f. 2. Desm. Mamm. Inhabits South America. British Museum.

? *Noctilio rufus*, Spix, Brazil, t. 35, f. 1. Inhabits S. America.

34. *PROBOSCIDEA*, Spix. *Embalanura*, Kuhl. Head long, conical; muzzle sharp, produced; forehead flat; upper jaw longest; cutting teeth $2 \frac{2}{6}$.

* *Interfemoral membrane truncated*. (Proboscidea, Spix.)

Proboscidea saxatilis, Spix, Braz. t. 35, f. 8, bad. Vesp. naso, Pr. Max. Abbild. t. *Embalonura saxatilis*? Temm.?

Proboscidea rivalis, Spix, Braz. Inhabits Brazils.

Proboscidea canina. Vesp. caninus, Pr. Max. Abbild. t. Inhabits Brazils.

** *Interfemoral membrane produced conical; heel-bone very long*, Centro nycteris.

Proboscidea calcarata. Vesp. calcaratus, Pr. Max. Abbild. t. Vesp. Maximiliani, Fischer. Inhabits Brazils.

* * * *Interfemoral membranes, &c.*———? (*Embalanura*, *Kuhl.*)

Proboscidea monticola. *Embalanura monticola*, *Kuhl.* Face depressed; forehead rounded; wings brown; expanse 6 inches; heel-bone 4 lines. Inhabits Java. Museum, Leyden.

35. *AELLO*, *Leach*. Head subconic; forehead flat; ears large, separate; cutting-teeth $\frac{2}{4}$; upper, chisel-shaped, 2 cut; tail rather elongated with a membranous band to the tip of the large truncated interfemoral membrane; heel-bone very slender.

Aello Cuvieri, *Leach*. *Linn. Trans.* xiii. 71. Inhabits ———? Museum University College of London.

† † *Tail produced beyond the bend of conical interfemoral membrane.*

36. *PTERONOTUS*, *Gray*. Ears lateral; tragus elongate lobed; chin with a reflexed cartilaginous edge to the lower lip, and an erect membranaceous ridge across its lower part; wings only affixed by a narrow line to the middle of the back, which is covered with fur beneath them; hind-feet long; the ankle rather produced and exposed; the lower angle of the wing lies folded over it.

Pteronotus Davyi, *Gray*. Mouse-coloured, wings baldish; exp. 12 inches. Inhabits Trinidad. Museum Fort Pit, Chatham. Tail imperfect. In honour of Dr John Davy, so well known for his physiological papers.

† † † *Tail thick, produced beyond the end of the short transversely-folded interfemoral membrane; thumb large, swollen beneath; cutting-teeth very variable in number.*

37. *CHEIROMELES*, *Horsf.* *Dysopes*, *Temm.* not *F. Cuv.* Ears small, separate, lateral; back nearly naked; great toe very large, versatile, bearded.

Collared-handed Bat. *Cheiromeles torquatus*, *Horsf.* Java, t. copied in *Dysopes cheiropus*, *Temm.* *Mon.* t. 7, and t. 23, f. 15. *Molossus torquatus*, *Fischer*. *Molossus cheiropus*, *Less.* Inhabits India, (Siam.) Museum, India House.

38. *NYCTINOMUS*, *Geoff.* Ears very large close together, or folded down on the forehead; muzzle obliquely truncated, bristly; lips very large, transversely grooved, and with scattered bristle-like hairs; thumb and little toe with a patch of white tufted hairs.

Nyctinomus plicatus. *Molossus plicatus*, *Fischer*. *Vesp. plicatus*, *Buchanan*, *Linn. Trans.* v. t. 13. *Dysopes plicatus*, *Temm.* *Nyctinomus tenuis*, *Horsf.* Java t. (dry) cop. *Dysopes tenuis*, *Temm.* *Mon.* t. 19, 20, t. 23, f. 30. 16 skeletons. *Nyctinomus Bengalensis*, *Geoff.* *Vesp. labiata*, *Hodgs.* *Dysopes labiatus*, *Temm.* *MSS.* ? *Nyctin. dilatatus*, *Horsf.* Java. *Gray's Illustr. Ind. Zool.* 2. *Molossus dilatatus*, *Lesson*.

The upper edge of the nose disk surmounted by a series of short close processes; face, with scattered flattened hairs, which are curv-

ed at the tip, some of them forming a tuft on the front of the lip ; ears united in a common tubercle in front ; the pad of the great and little toes narrow, hairs slender, long. Inhabits India (Bengal) Java. British Museum.

Nyctinomus Rüppelli. *Dysopus Rüppelli*, *Temm.* Mon. t. 18, t. 23, f. 6, 8. *Molossus Rüppelli*, *Lesson*. Upper lip with scattered straight black bristles, intermixed with flat hooked ones ; pad of great and little toes very large. Inhabits Egypt and Fernando Po. British Museum.

Nyctinomus pumilus. *Dysopes pumilus*, *Rüppell*, Atlas, t. 27, a. Inhabits North Africa, (Egypt.) Dr Rüppell.

Nyctinomus murinus, *Gray*, Griff. A. K. v. 187. *Molossus murinus*, *Fischer*. Petit chauve-souris obscure, *Azara*? Face hairy, with black bristles ; upper lip simple in front ; ears round, separated at the base in front ; tragus slender ; pad of great and little toes large, broad. Inhabits South America, (Brazils ;) West Indies, (Jamaica.) British Museum.

Nyctinomus nasutus. *Molossus nasutus*, *Spix*, Braz. t. 35, f. 7. *Dysopes nasutus*, *Temm.* Mon. t. 24, f. 2, 3. *Nyctinomus Brazilianensis*, *I. Geoff.* Ann. Sc. Nat. I. t. 22, f. i. cop. Zool. Journ. t.

39. *MOLOSSUS*, *Geoff.* Ears very large, close together and folded down on the forehead ; face conical ; nose rounded at the end ; lips smooth or hairy ; great and little toe with a pad of hooked hairs ; throat with a central pouch in front ; lower joint of thumb swollen.

Molossus velox, *Lesson*. *Dysopus velox*, *Temm.* Mon. t. 22, f. 1. t. 23, f. 22 ; upper lip with a roundish group of close slender hooked hairs in front ; throat-pouch large. Inhabits Brazils, Cuba. British Museum.

Molossus fuliginosus. Face naked, black with a bunch of hairs on each side, just before the eyes ; upper lip with a triangular patch of hooked white hairs in front ; lips smooth, inner edge slightly fringed with rather stiff hairs in front ; tragus long pointed ; tail half free ; nose-disk convex with denticulations on the edge, with a triangular bunch of hair below the nostril ; end of face hairy ; throat-pouch small. Inhabits —? British Museum.

Molossus rufus, *Geoff.* *Dysopes rufus*, *Temm.* Mon. t. 23, f. 19. teeth. *Dysop. perotis*, *Pr. Max.* Abbild. t. . Upper lip with a narrow erect triangular group of hooked hairs between the nostrils ; edge of the nose disk finely crenate ; ears close together in front. Inhabits Brazils, Surinam. British Museum.

Molossus australis. Dark-brown, rather paler beneath, with a broad pure white streak down each side, between the wing and the body, and a narrow white streak round the edge of the rump beneath ; ears large, broad, rounded ; tail nearly one-half free. In-

habits New South Wales. (Major Macarthur.) United Service Museum.

40. *THYROPTERA*, *Spix*. Ears large, close together, and folded down over the forehead; lips thick; muzzle obliquely truncated; thumb thin, with a large rounded dilatation at the middle-joint; hind feet weak, small.

Thyroptera tricolor, *Spix*, *Braz*, t. 36, f. 1, evidently young. Black-brown above, beneath pale-white; wings and ears black. Inhabits Brazil.

41. *MYOPTERIS*, *Geoff*. Ears large, lateral; muzzle short and blunt; cutting teeth, $\frac{2}{2}$, upper pointed, close together.

Myopteris Daubentonii, *Geoff*. from *Rat volant*, *Daubenton*, *Mem. Ac. Paris*, 1759, 386. Inhabits N. America. Is it a *Noctilio*?

See also *Nycticegus cynocephalus*, *Le Conte*.

* * * *Tail very short, many-jointed, enclosed in a two-valved sheath, placed at the base of the extended interfemoral membrane.*

42. *DICLIDURUS*, *Pr. Max*.

Diclidurus Freyreissii, *Pr Max*. *Isis*, 1819. *D. albus*, *Pr. Max*. *Abbild*, t. Inhabits Brazils. Museum, Neuwied. Perhaps more allied to *Vespertilionina*.

TRIBE V.—PTEROPINA.

Grinders bluntly tubercular; nose simple; nostrils slightly produced; end of index finger-clawed; head conical; ears simple, lateral; tragus none; wings long; lower joint of thumb long, united to the wing by a membrane; interfemoral membrane short; tail none, or short; living on fruit in Indian islands and Polynesia.

43. Ternate Bat, *PTEROPUS*. Head long, conical; muzzle acute; grinders $\frac{5}{6}$ or $\frac{4}{6}$; tongue short; wings from the side of the body; tail none, or short.

* *Tail none; ears large.*

Black Ternate Bat, *Pteropus edulis*, *Pennt*. *Pt. Javanicus*, *Desm. Temm. Mon.* t. 15, f. 1. *Pt. Edwardsii*, *Geoff?* *Vesp. vampyrus*, *Linn*. *Vesp. Celaeno*, *Herm. Seba*, t. 57, f. 2. Ternate Bat, *Pennt*. Var. *Pt. Edwardsii*, *Geoff*. Inhabits Java, Sumatra, Timor, Bengal?

Indian Ternate Bat, *Pteropus medius*, *Temm*. Inhabits India, (Calcutta, Pondicherry.)

* * *Tail none; ears small.*

Pale-faced Ternate Bat, *Pteropus phaiops*, *Temm*. Inhabits Madagascar.

Grey-headed Ternate Bat, *Pteropus poliocephalus*, *Temm*. Inhabits New Holland.

Red-necked Ternate Bat, *Pteropus dasymallus*, *Temm.* Mon. t. 10, t. 13, f. 10, 11, cran. *Pteropus rubricollis*, *Siebold*, not *Geoff.* Inhabits Japan.

Common Ternate Bat, *Pteropus vulgaris*, *Geoff.* Roussette, *Buff.* H. N. x. t. 14. cop. Vesp. caninus, *Schreb.* t. 44. Inhabits Isle of France, Bourbon, (Madagascar?)

Red-collared Ternate Bat. *Pteropus rubricollis*, *Geoff.* Pt. collaris, *Licht.* Vesp. Vampyrus β . *Erxleb.* Roussette, *Buff.* H. N. x. t. 17. Inhabits Cape of Good Hope, *Lichtenst.* Bourbon and Madagascar, *Temm.*

Pale Ternate Bat, *Pteropus pallidus*, *Temm.* Mon. t. 15, f. 8, 9. Inhabits Banda.

Keraudren's Ternate Bat, *Pteropus Keraudrenii*, *Quoy* and *Gaim.* Voy. Uran, t. 3. *Temm.* Mon. t. 15, f. 7. cran. Pt. Marianus, *Desm.* Inhabits Island of Guam. *Quoy* and *Gaimard.*

Amboyna Ternate Bat, *Pteropus Dussumieri*, *Isid. Geoff.* *Belanger*, Voy. 9, 8. Inhabits India and Amboyna.

Grey Ternate Bat, *Pteropus griseus*, *Geoff.* Ann. Mus. xv. t. 6. cop. *Temm.* Mon. t. 11. Inhabits Timor. *Pennt.*

Masked Ternate Bat, *Pteropus personatus*, *Temm.* Mon. 189. Inhabits Ternate Islands.

See also *Pteropus leucocephalus*, *Hodgson.* Inhabits Nepaul.

* * * Tail very short.

Pteropus Aegyptiacus, *Geoff.* *Pteropus Geoffroyi*, *Temm.* t. 15. f. 14, 15. Inhabits N. and E. Africa. *Dr Turnbull Christie.*

Pteropus Leachii, *A. Smith*, Zool. Journ. Inhabits Cape of Good Hope.

Pteropus stramineus, *Geoff.* *Temm.* Mon. 1, t. 15, f. 12, 13. Inhabits Timor.

* * * * Tail rather elongated. ($\frac{1}{2}$ inch.)

Pteropus Leschenaultii, *Desm.* Inhabits Pondicherry.

Pteropus amplexicaudatus, *Geoff.* Ann. Mus. xv. t. 7. Cop. Dict. Sc. Nat. t. and *Temm.* Mon. t. 13. t. 15, f. 16. Inhabits Timor, Amboyna, Sumatra, Siam. (C. Good Hope?)

44. CYNOPTERUS, *F. Cuv.* *Pachysoma*, *Isid. Geoff.* Head short broad; lips thick on the sides; grinders $\frac{4}{3}$; tail short, free; wings from the side of the back.

Cynopterus marginatus, *Fr. Cuv.* *Pteropus marginatus*, *Geoff.* Ann. Mus. xvi. t. 8. cop. *Temm.* 1, t. 14. Inhabits India.

Cynopterus titthæcheilus. *Pteropus titthæcheilus*, *Temm.* Mon. t. 13, f. 17, 24. *Pachysoma mammilevre*, *Geoff.* Male with a tuft of hair on the side of the neck, white in young, reddish in adult. *Is. Geoff.*

Cynopterus brevicaudatus. *Pachysoma brevicaudatum*, *Is. Geoff.*

Inhabits Sumatra. Tail very short. This and the next are probably varieties of the former.

Cynopterus Diardii. *Pachysoma Diardii*, *Is. Geoff.* Inhabits Sumatra.

Cynopterus Duvancellii. *Pachysoma Duvancellii*, *Is. Geoff.* Inhabits Sumatra. Thumb of wing elongated.

Cynopterus melanocephalus. *Pteropus melanocephalus*, *Temm.* Mon. t. 12, t. 18, f. 3, Scel. f. 4, teeth. *Pachysoma melanocephalum*, *I. Geoff.* Inhabits Java. Wings very short, rounded.

The *Vespertilio Sphinx*, *Vahl. Natur. Selsk. Skriv. iv. 130*, from Tranquebar, probably belongs to this genus.

45. *EPOMOPHORUS*, *Bennett*.—Head very large, muzzle acute long; grinders $\frac{3}{5}$ front lower small; tail none? wings far back.

a. Tuft of white hair near the ears, and another on the sides of the body, false grinders 3.

Epomophorus Whitii. *Pteropus Whitii*, *Bennett*, Trans. Zool. Soc.—*Pt. epomophorus*, *Bennett*, Proc. Zool. Soc. Inhabits W. Africa.

b. Tuft of white hairs at the base of the ears; head very long.

Epomophorus macrocephalus. *Pteropus macrocephalus*, *Ogilby*, Proc. Zool. Soc. iii. 100. *Pt. megacephalus*, *Swains.* Lardn. Cycl. 92, p. 31 and 154. Inhabits W. Africa. British Museum.

c. Tuft of white hairs at the front base of the wing, head moderately long.

Epomophorus Gambianus. *Pteropus Gambianus*, *Ogilby*, l. c. W. Africa.

46. *MACROGLOSSA*, *Lesson*. *Macroglossum*, *F. Cuv.* not *Fabr.* Head elongated; muzzle slender, subcylindrical; tongue long, slender, exsertile, smooth; wings from the sides of the back; live chiefly on the fruit of *Eugenia*.

Macroglossa minima. *Pteropus minimus*, *Geoff.* *Pt. rostratus*, *Horsf.* Java, t. *Temm.* Monog. t. 15, f. 25, 30, t. 16, f. 1, 2, *M. kioidotes* and *M. Horsfieldii*, *Lesson*. Inhabits Java, (*Gen. Hardwicke.*) British Museum. East India Company.

47. *HARPYIA*, *Illiger.* not *Cuv.* Head short broad; lips thick; grinders —? wings arising from the centre of the back; index-finger clawed; tail very short.

Harpyia Pallasii, *Desm.* *Cephalotes Pallasii*, *Geoff. Ann. Mus.* xv. *Vesp. cephalotes*, *Pall.* Spic. Zool. iii. t. 1 and 2. cop. *Schreb.* t. 61. *Cephalote*, *Buffon*, H. N. Suppl. iii. t. 2. *Molucca bat*, *Pennt.* *Pteropus Cephalotes*, *Tiedem.* Inhabits Molucca Islands.

See also *Cephalotes tæniotis*, *Rafin.* from Sicily.

48. *CEPHALOTES*, *Fr. Cuv.* *Hypoderma*, *Isid. Geoff.* Head short, broad, lips thick; wings arising from the centre of the back; index-finger not clawed.

Cephalotes Peronii, Geoff. Ann. Mus. xv. t. 9. cop. Dict. Sc. Nat. t. *Hypoderma Peronii*, Isid. Geoff. jun. *Pteropus palliatus*, Geoff. Ann. Mus. xv. 99. Inhabits Timor.

II.—*Account of a Botanical Excursion in the Alps of the Canton of Valais, Switzerland, in August 1835; and Catalogue of the Plants collected, with occasional Remarks.* By R. J. SHUTTLEWORTH, Esq. (Continued from p. 196.)

235. *C. scabiosa*, L. α . *macrophylla*, foliis radicalibus maximis ly-rato-pinnatifidis, laciniis integerrimis, terminali ovato-obtuso maximo. γ . *leptophylla*, foliis radicalibus subbipinnatifidis, caulinis pinnatifidis, laciniis fere linearibus acutis subintegris, subtus, præsertim junioribus, subincano-tomentosis. *C. scabiosa*, γ . *tenuifolia*, Gaud?

H. α . In dumetis inter Thermas Leucenses et Inden; β . in collibus apicis inter Varen et Siders.

Obs. Folia radicalia in spec. meis var. α , 6 ad 8 uncialia lacinio terminali 2-3 uncias lata et 3-5 longa. Caulina etiam maxima sublyrata profundissime pinnatifida, laciniis etiam integerrimis arcuatis, recurvis. In var. β . capitula fere duplo minora quam in var. α ., involucri majus ovato, et. phyllis pallidis brevis ciliatis. Varietatem inter α . et γ fere mediam in segetibus Hiberniæ legi, foliis subbipinnatifidis, laciniis ovato-lanceolatis inciso-dentatis.

236. *Carlina vulgaris*, L.

H. In apricis inter Inden et Varen.

237. *Xeranthemum inapertum*, Willd.

H. In arvis incultis inter Varen et Siders, copiose.

238. *Hieracium pilosella*, L. H. foliis integerrimis obovato-ellipticis, stolonibus repentibus, involucri squamis lineari-lanceolatis, scapo monocephalo. α . viride. Ser. foliis utrinque viridibus, sparse pilosis. H. P. β . viride, Gaud. Helv. v. p. 71, β . vulgare, foliis dorso-tomentosis, pilis utrinque sparsis longis hirtis. H. P. α . vulgare, Gaud. l. c. γ . *arenarium* mihi, late repens, pluriscapum, foliis minoribus facie viridibus pilis sparsis longis hirtis, dorso, stolonibusque, incano-tomentosis; capitulis parvis involucri incano. δ . incanum, involucri, foliisque utrinque incano-tomentosis, tomento brevissimo, vix pilosis. H. P. β . incanum, DC. H. Fr. iv. p. 23. H. P. γ . incanum, Gaud. l. c. ϵ . *pilosellæforme*, foliis dorso-incanis, facie sparse pilosis, scapo elato incano, pube brevi atra conspersa; capitulis majoribus, phyllis lineari-lanceolatis latioribus incanis, pube brevi atra ad carinam consitis. H. *pilosellæ forme* Hoppe, Gaud. l. c. H. *pilosella alpina* Hoppe exst. β . *Peleterianum*, foliis obovato-lanceolatis elongatis, sub-



Gray, John Edward. 1838. "I.—A Revision of the Genera of Bats (Vespertilionidæ), and the Description of some new Genera and Species." *Magazine of zoology and botany* 2, 483–505.

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