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THE  
**ANIMAL KINGDOM**

ARRANGED IN CONFORMITY WITH ITS  
ORGANIZATION,

**BY THE BARON CUVIER,**

*MEMBER OF THE INSTITUTE OF FRANCE, &c. &c. &c.*

WITH

**ADDITIONAL DESCRIPTIONS**

OF

**ALL THE SPECIES HITHERTO NAMED, AND OF  
MANY NOT BEFORE NOTICED,**

BY

**EDWARD GRIFFITH, F.L.S., A.S., &c.**

*AND OTHERS.*

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**VOLUME THE FIFTH.**

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Charing Cross.

**SYNOPSIS OF THE SPECIES**  
**OF THE**  
**CLASS MAMMALIA,**

**AS ARRANGED WITH**

**REFERENCE TO THEIR ORGANIZATION,**

**BY**

**CUVIER,**

**AND OTHER NATURALISTS.**

**WITH**

**SPECIFIC CHARACTERS, SYNONYMA,**  
**&c. &c.**

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A

**SYNOPSIS OF THE SPECIES**

OF THE CLASS

**MAMMALIA.**

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THE preceding supplemental essays on the text of our author, like the text itself, by no means furnish even a sketch of all the species hitherto described, but as the examination of the most ingenious machinery, however interesting in the detail of all its parts, is but an idle amusement, unless the final object and utility of the machine itself be borne in mind, so the study of the various peculiarities of organized nature is but a profitless pursuit unless the characters, habits, and relative situations of the several animals themselves be considered.

Hence some additional biographical matter seemed absolutely necessary to the utility of the present undertaking, as otherwise that harmonious adaptation of means to ends of the works of creation, which becomes the more apparent in proportion to the pains bestowed on its investigation, might be neglected or forgotten.

One considerable difficulty in the insertion of additional descriptions and biographical matter is, however, to know where to stop—to feel satisfied that the English reader has been introduced into the hitherto neglected arcana of zoological science sufficiently to enable him, by drawing conclusions in his own mind from the premises stated, to derive both profit and amusement from the pursuit; and at the

## SYNOPSIS OF THE

same time fairly to presume that neither his patience nor his purse have been unnecessarily or excessively drawn upon.

To accomplish this object as far as possible, the following tabular view\* is appended. This is intended to present, not merely a list of all the species hitherto known, but also their various synonyma with references to the first zoologists who have described them under each name given, and to the best figures, with occasional observations, particularly where any uncertainty seems to arise as to the real distinctiveness of any particular species. In presenting this list, however, with the authorities for the several species enumerated, it is by no means pretended to vouch for the accuracy or propriety of the specific separation of each; but they will be translated from the best monographs on the subject, revised by actual observations, as far as the collections of England, and the remarks of foreign writers, will permit.

This table is constructed according to the arrangement of the 'Règne Animal' of Cuvier. To the student in systematic zoology it will matter little whether he divides the orders with that author into a few genera, and each genus into several sub-genera or groups, or whether, with the more modern and refined zoologists, he treats each group or subdivision as a distinct genus. The present table will avail equally either way.

### CLASS I.—MAMMALIA.

ANIMALS covered with hair, having a back bone or vertebral column, red warm blood, and respiring air, by means of lungs, floating in a peculiar cavity. The fœtus, sustained by the mother in the womb, and born with signs of life. The young nourished with milk from the mammæ or teats of its mother.

\* The synopsis will only be paged at the bottom, in order that each part of it as given at the end of each order, may be separated from the rest, and bound in a distinct volume if desired.

SPECIES OF MAMMALIA.

ORDER I.—BIMANA.

**TEETH** of three sorts. The posterior extremities proper for walking, the anterior furnished with hands. Nails all flat ; teats two, pectoral ; body vertical ; stomach simple ; intestines furnished with a small cæcum ; orbital and temporal fossæ distinct.

*Eats* both animal and vegetable matter.

*Inhabits* almost the whole of the earth's surface.

Genus I. **HOMO.**

Cutting teeth,  $\frac{1}{2}$ . Canine,  $\frac{1}{1}-\frac{1}{1}$ . Cheek teeth  $\frac{1}{2}-\frac{1}{2}=32$ .

I. Species 1. *Homo Sapiens*, "knowing himself." *Lin.*

**Var. a. Caucasian variety.**—Face oval ; facial angle  $85^{\circ}$  ; forehead high expanding ; cheeks coloured red ; hair long and thick.

*Inhabits* Europe, (excepting Lapland and Finland), Western and Northern part of Asia.

**b. Mongolian variety.**—Face broad and flat, olivaceous ; facial angle  $75^{\circ}$  ; eyes narrow and oblique ; hair hard, strait, black ; beard thin.

*Inhabits* Eastern Asia, Finland and Lapland in Europe, and the Esquimaux part of North America.

**c. American variety.**—Face broad, reddish copper-colour ; cheek-bones very prominent ; forehead short ; nose flattish ; hair black ; beard weak.

*Inhabits* America (except the Esquimaux).

**d. Negro variety.**—Face black, projecting forward below ; facial angle  $70^{\circ}$  ; forehead narrow, slanting, arched ; lips large ; nose thick ; hair crisp.

*Inhabits* all the middle parts of Africa.

**e. Malay variety.**—Face brownish, rather projecting for

## SYNOPSIS OF THE

ward ; nose rather full and broad, apex thickened ; mouth large ; hair thick, black, and curled.

Inhabits near the Ganges, the islands of the Indian Ocean, and the Polynesia.

*Obs.* These are the principal varieties, to one or other of which the minor ramifications may in general be traced.

### ORDER II.—QUADRUMANA.

**TEETH** of three sorts. The four extremities furnished with hands ; teats two or four, pectoral ; bones of the arms and legs separate, capable of pronation and supination ; stomach simple, membranaceous ; intestines short, with a small cæcum ; the orbital and temporal fossæ distinct.

*Eats* fruit, roots, and insects. *Lives* in trees. Intelligent, active.

*Inhabits* the warm parts of America, Africa, and India.

#### Genus I. SIMIA.

Form approaching that of man, cutting teeth  $\frac{1}{2}$ , canine  $\frac{1}{4}$ , grinders  $\frac{2}{3}$ , bluntly tubercular. Nostrils close, separated merely by a thin septum ; teats two, pectoral ; tail wanting or varying in length, never prehensile, with distinct cheek pouches, and often with callosities on the buttocks.

*Eats* fruit, insects, and sometimes birds.

*Inhabits* Africa and India, and its islands.

Sub-genus I. TROGLODYTES. Geoffroy, *Facial angle*, 50°. ; no cheek pouches, tail, nor callous buttocks ; arms short ; superciliary ridges distinct.

2. 1. S. T. *Niger* (Chimpanzé). Fur black.

*Homo silvestris* Tyson *Anat. of a pygmy*. *Homo troglodytes*, *Lin. Syst. Nat.* 33. *Simia troglodytes*, *Gmelin*, 26. *S. Pygmea* et *S. Satyrus*, *Schreb.* *Troglodytes niger*, *Geoffroy, Ann. Mus.* XIX. 87. *Mimetes*, *Leach, Jour. Phys.*

## SPECIES OF MAMMALIA.

Man of the Woods. *Edwards, Glean.* Great Ape, *Pen-  
nant, Quadrupeds.* Jocko, *Buff.* xiv ; Pongo, *ib. supp.* vii.

Icon. *Tyson*, with the skeleton, viscera, &c., *Edwards, Buffon.* xiv. *Tulpius, Obs. med.*—*Schreber, l. c. tab. 1, 2 Audebert, t. 1.*—*Griff. Vert. Anim.*

Inhabits Africa, especially about Angola and Congo.

*Obs.* The adult state is unknown

II. PITHECUS.—*Geoffroy. Facial angle 65°; no cheek-  
pouches, tail, nor callosities; arms very long; no superciliary  
ridges, at least in the young state.*

3. 1. *S. P. Satyrus*, (Orang-Outang). Fur brown.

*Simia Satyrus. Lin. Syst. nat.* 34. *S. agrias. Schreb.*

Orang-Outang, *Vosmaer.* Jocko. *Buff., supp.* viii.

Icon. *Abel's Embassy to China. Edwards, Glean. Vosmaer. Camper, Nat. Ver. t. 4. Schreb. t. 2, B. t. 2, C. Buff. vii. t.*

1. *Audebert Hist. des Singes, t. 2. Griff. Vert. Anim.*

Inhabits the eastern parts of Asia, near *Malacca and Borneo.*

*Obs.* Adult state not known. Presumed then to be the Pongo.

4. 2. *S. P. Wurmbii*, (Pongo). Fur black. The arms reaching to the ancles; superciliary and sagittal ridges very distinct.

Pongo *Wurmbii. Geoff. Cynocephalus Wurmbii. Illiger.*

Pongo. *Wurmb. Mem. Soc. Bat. ii. 245. Singe de Wurmb. Audebert, Hist. des Singes. Blainville Jour. Phys.*

Icon. *Audebert Hist. des Singes; skeleton.*

Inhabits Borneo and the Indian Archipelago.

*Obs.* Most probably the adult Orang Outang.

III. HYLOBATES. *Illiger.*—*Facial angle, 60°; no cheek pouches nor tail; buttocks callous; arms excessively long.*

5. 1. *S. H. Lar.* (Gibbon). Fur black; face surrounded with gray.

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**Homo Lar.** *Lin. Mantissa*, II. 521. **Simia Lar.** *Gmelin. S. longimana*, *Schreb.* **Pithecus Lar.** *Geoff. Ann. Mus.* XIX. 88.

Long-armed Ape, *Penn Quad.* Gibbon, *Buff.* XIV.

Icon. *Schreb. t. 3, f. 1.* *Buff.* XIV., t. 2.

Inhabits East Indies, near Coromandel and Malacca, and the Molucca Islands.

6. 2. *S. H. variegatus* (Little Gibbon). Fur varied with gray brown, and deep gray.

**Simia Lar.  $\beta$ .** *Gmel. S. longimana. var. Schreb. S. longimana. Mus. Leverianum.* **Pithecus variegatus,** *Geoff. Ann. Mus.* XIX. 88.

Little Gibbon, *Penn. Quad.* Petit Gibbon, *Buff.* XIV.

Icon. *Schreb. t. 3. Mus. Leverianum, t. 1., Buffon, XIV., t. 3.*

Inhabits Malacca.

*Obs.* This is probably a mere variety of the last, it is distinguished, however, by being less in stature, and having the white hairs extending round the face, and also over the shoulders.

7. 3. *S. H. leuciscus* (Wow Wow). Fur ash gray; face black; callosities very large.

**Simia lar.  $\beta$ .** *Penn. Quad. S. leucisca, Schreb. Pithecus leuciscus, Geoff. Ann. Mus.* XIX., 89

Wouwou, *Camper. Moloch, Audebert.* Gibbon cendré, *Cuvier, Règne Animal*, 103.

Icon. *Audebert 1. § 1. f. 2.*

Inhabits Malacca and Sunda Islands.

8. 4. *S. H. Syndactyla* (the Siamang). Fur black; neck and breast naked; the index and middle finger of the hinder extremities united to the end of the second phalanx.

**Simia syndactyla,** *Raffles, Trans. Lin. Soc.* XIII., 241. **Siamang,** *F. Cuvier, Mamm. lithog.*

SPECIES OF MAMMALIA.

Icon. *Horsfield, Zool. Res.* — *F. Cuvier, l. c.*

Inhabits Sumatra.

9. 5. *S. H. Agilis* (the active Gibbon). Fur brown; back yellowish; forehead very low; orbital arches very prominent; face of the male blue black, of the female brown.

*Hylobates agilis, F. Cuvier, Mamm. lithog.* *Pithecus agilis, Desm. Mamm.* 532.

Gibbon ounko, M.M. *Diard and Duvancel.*

Icon. *F. Cuvier, Mamm. lithog.*

Inhabits Sumatra.

IV. PRESBYTIS.—*Eschscholts.* *Facial angle* 60°; *cheek-pouches none; callosities distinct; tail long; arms reaching to the knees.*

10. 1. *S. P. Mitrula* (the Capped Monkey). Fur finely curled, above of a bluish green colour, beneath grayish white; head crested, with a black line from the upper part of the ears across the head.

*Presbytis mitrula, Eschscholtii, Kotzebue, Voyage of Discovery,* II, 353.

Icon. Of the cranium and hands, *l. c.*

Inhabits Sumatra.

*Obs.* Length from head to rump one foot and a half; tail two feet. Called *Presbytis* on account of its resemblance to an old woman with a cap on her head.

VI. COLOBUS.—*Geoffroy\**. *Facial angle of* 40=45°; *muzzle short; anterior hands destitute of thumbs; tail very long and thin; cheek pouches and callosities distinct.*

11. 1. *S. C. polycomos* (the peruke or full-bottom

\* It seems doubtful whether this genus exist distinct from the *Macacus*, the *S. Silenus* of *Linnaeus*, but we have the authority of *Geoffroy* and others that it does.

SYNOPSIS OF THE

monkey). Fur black, with a variegated mane covering the neck, and upper part of the back, and shoulders.

*Simia polycomos*, Schreb. *S. comosa*, Shaw, 1. 59.

*Colobus polycomos*, Geoff. *Ann. Mus.* XIX. 92.

Guenon à camail, Buff. *suppl.* VII. Full-bottom monkey, Penn. *Quad.* 1. 197. King monkey, Dealers.

Icon. Penn. *Quad.* 1. t. 25. Schreb. t. 10, D. Shaw, *Zool.* 1. t. 24. Buff. VII. t. 17.

Inhabits the forest of Sierra Leone and Guinea.

12. 2. *S. C. ferruginosus* (Bay Monkey). Fur ferruginous; top of the head, hands, and tail, black.

*Simia Ferruginosa*, Shaw, *Gen. Zool.* 1. 59. *Colobus Ferruginosus*, Geoff. *Ann. Mus.* XIX. 92.

Autre Guenon, Buff. *suppl.* VII. 66. Bay Monkey, Pennant, *Quad.* 203.

Icon. —

Inhabits —

Obs. Considered by M Lacépède to be a variety of the former.

13. 3. *S. C. Temminckii* (Temminck's Colobus). Fur black; neck, shoulders, and outer face of the thighs, black; face, tail, and belly, white.

*Colobus Temminckii*, Kuhl. *Mss. Desm. Mamm.* 53.

Icon. —

Inhabits —

Mus. Bullock. Now in possession of M. Temminck.

VII. LASIOPYGA.—Illiger. *Facial angle of 45°.*; head round, muzzle slightly prolonged; hands very long, all provided with thumbs; thumbs of the anterior hands very short and thin; tail long; cheek-pouches distinct; buttocks not callous, fringed with hair.

14. 1. *S. L. nemæus* (the Douc or Cochin China monkey). Fur varied with brilliant colours.

SPECIES OF MAMMALIA.

*Simia nemæa*, *Gmelin, Sys. Nat.* 34. *Lasiopyga nemæus*,  
*Illiger, Prod. Pygathrix nemæus. Geoff. Ann. Mus.* xix. 90.

Le Douc, *Buffon*, xiv, 298, Cochin-China monkey.  
*Penn. Quad.* 211.

Icon. *Buff.* xiv. t. 41. *Supp.* vii. t. 23. *Audeb. Hist.* 4.  
§ 1. f. 1. *Shaw, Zool.* t. 23.

Inhabits Cochin-China and Madagascar.

VIII. NASALIS.—*Geoffroy, Facial angle of 40-45°; head round, muzzle slightly prolonged, nose greatly prominent and elongated; ears small, round; body squat; hands long; anterior thumbs short; tail longer than the body; buttocks callos.*

15. 1. *S. N. Larvatus* (The Proboscis monkey). Fur reddish yellow; face black; nose very long.

*Simia Nasalis, Gmelin, pref. Shaw, Zool.* 1. 55. *S. nasica, Schreb. Cercopithecus larvatus, Wurmb. Mem. Soc. Batav. Nasalis larvatus, Geoff. Ann. Mus* xix 21.

Proboscis monkey, *Pen. Quad. App.* 322. Nasique. *Daubent. Mém. Acad. Scien. Guenon à long nez. Buffon supp.* vii.

Icon. *Buff. Supp.* vii. t. 11, 12. *Penn. Quad.* t. 104, 105. *Audebert t. 4. § 2. f. 1.*

Inhabits Borneo.

IX. SEMNOPITHECUS.—*F. Cuvier. Facial angle of 45°, head round, nose flat; ears moderate; limbs very long; thumbs of anterior hands very short and remote; cheek-pouches and callosities on the buttocks; tail very long and thin.*

16. 1. *S. S. Maurus* (The Negro Monkey). Fur black, with a white spot beneath, near the origin of the tail.

*Simiá maura, Gmelin, 35. Cercopithecus maurus, Geoff. Ann. Mus.* xix. 92.

Middle-size black monkey; *Edwards, Glean. Negro*

SYNOPSIS OF THE

Monkey, *Penn. Quad.* 206. Guenon Nègre, *Buff. Sup.* VII, 83.

Icon. *Edwards, Glean.* t. 311. adult; *Buff. Supp.* VII. t. 83. *Schreb.* t. 22. *B.* young.

Inhabits the Island of Java.

17. 2. *S. S. Melalophus* (The Simpai). Fur shining yellow, red above, whitish beneath; forehead with a tuft of black hairs in the form of a band; face blue.

*Simia Melalophos.* *Raffles, Lin. Trans.* XIII. *Semnopithecus melalopus.* *F. Cuvier, Mam.*

Simpai of the *Javanese.*

Icon. *F. Cuvier, Mam. Lithog.*

Inhabits Island of Sumatra, *Raffles.*

18. 3. *S. S. Pruinusosus.* Fur blackish glazed with white; face brown.

*Simia Villosa.* *Griff. Vert. Ani.* 56. *Semnopithecus pruinusosus.* *Desm. Mam. Supp.* p. 533.

Icon. *Griff. Vert. Anim.* t. 6.

Inhabits Isle of Sumatra, *M.M. Diard. et Duvaucel.*

Obs. This animal differs from the *S. Maurus* in the want of the white spot near the insertion of the tail, and the fore-hands are black.

19. 4. *S. S. Comatus.* Fur above gray, beneath dirty white; upper part of the head covered with black hairs, forming a tuft towards the occiput.

*Semnopithecus comatus,* *Desm. Mam. sup.* 533.

Icon. —

Inhabits Sumatra, *M.M. Diard et Duvaucel.*

20. 5. *S. S. Entellus* (The Entellus). Fur yellowish white; hands all black.

*Simia Entellus.* *Dufresne, Bul. Soc. Phil.*—*Schreb.*—*Cercopithecus Entellus.* *Geoff. Ann. Mus.* XIX. 95.

*Entelle Audeb. Hist.*

SPECIES OF MAMMALIA.

Icon. *Audeb. Hist.* 4. §. 2, f. 2. *Schreb. t.* 23. f. B.  
Inhabits Bengal.

X. CERCOPITHECUS.—Geoffroy, *facial angle of 50°*; head round, no superciliary ridges, edges of the orbits smooth, nose flat, nostrils open to the nasal fossæ; ears moderate; cheek-pouches and callosities on the buttocks; tail longer than the body.

21. 1. *S. C. Auratus* (the golden guenon). Fur golden yellow, with long hair on the cheeks and forehead, and a black spot on the knee.

*Cercopithecus auratus*, *Geoff. Ann. Mus.* XIX. 93.

Icon.—

Inhabits India and Molucca.

22. 2. *S. C. Talapoin* (the Talapoin Monkey). Fur olivaceous above, yellowish white beneath; tail ash-coloured; feet black.

*Simia talapoin*, *Gmel.* 35. *Cercopithecus talapoin*, *Geoff. Ann. Mus.* XIX. 93.

Talapoin Monkey, *Penn. Quad.* 206. Talapoin, *Buff.* XIX.

Icon. *Buff.* XIX. t. 40. *Schreb. t.* 17.

Inhabits Africa.

*Obs.* Cuvier thinks this may be the young of the Malbrouc.

23. 3 *S. C. Latibarbatus* (The purple-faced or broad-bearded monkey). Fur black; with a very large laterally-extended beard; end of tail tufted; face violet purple.

*Simia dentata*, *Shaw, Zool.* 1, 24. *S. Veter?* *Shaw*, 1, 36. *Cercopithecus latibarbatus* *Temm. Cat.*; *Geoff. Ann. Mus.* XIX. 94. Adult.

Purple-faced monkey, *Penn. Quad.* Broad-toothed baboon, *Penn. Quad.* Guenon à face pourpré, *Buff. Supp.* VII. 80.

Icon. *Shaw, Zool.* 1. t. 13. *Penn. Quad.* t. 24. *Buff. Supp.* VII. t. 21.

Inhabits —

SYNOPSIS OF THE

24. 4. *S. C. Cephus* (Mustache Monkey). Fur greenish brown; the latter half of the tail bright red; nose and lips blue.

*Simia cephus*. *Lin. Sys. Nat.* 39. *S. mona*, *Schreb. Cercopithecus cephus*, *Geoff. Ann. Mus.* XIX. 94.

Mustache Monkey, *Penn. Quad.* 205. Moustac, *Buff.* XIV.

Icon. *Schreb. t.* 19, *t.* 15. *Buff.* XIV. *t.* 39. *Audebert.*

Inhabits —

25. 5. *S. C. Pileatus* (Bonneted Monkey). Fur, above brownish yellow, beneath white, with long hairs on the forehead.

*Simia pileata*. *Shaw Zool.* I. 53. *Cercopithecus pileatus*, *Geoff. Ann. Mus.* XIX. 94.

Bonneted Monkey, *Penn. Quad.* Guenon couronné. *Buff. Sup.* VII.

Icon. *Buff. Sup.* VII. *f.* 10.

Inhabits —

*Obs.* This seems nearly allied with, if it be not actually the Chinese bonneted monkey, *Simia sinicus* of Gmelin.

26. 6. *S. C. Mona* (Varied Monkey). Fur chesnut colour, outer part of the extremities black; with two white spots on the buttock.

*Simia mona* and *S. monacha*. *Gm. Sys. Nat.* *Cercopithecus mona*. *Geoff. Ann. Mus.* XIX. 95.

The varied monkey, *Penn. Quad.* 210. *Shaw's Zool.* I. 54. La Mone, *Buff.* XIV., and La Mone. *ib. Sup.* VII.

Icon. *Schreber, t.* 15 *f. A. Buff. t.* 36, and *Sup. t.* 19. *Audebert, t.* — *Shaw's Zool. t.* 18.

Inhabits —

27. 7. *S. C. Nictitans*, (White-nosed Monkey). Fur black, sprinkled with greenish gray; nose white and swollen; the anterior extremities above quite black.

*Simia Nictitans*. *Lin. Sys. Nat.* 40. *Cercopithecus nictitans*, *Geoff. Ann. Mus.* XIX. 95.

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Guenon à long nez proéminent. *Buff. Sup.* 7. Le Hocheur. *Alleb. Hist.* 4. S. 1. White Nose Monkey, *Penn. Quad.* 205. *Icon. Buff. Supp.* vii. t. 18. *Audeb* 4 § 1. t. 2. Inhabits Guinea.

28. 8. *S. C. Petaurista* (Vaulting Monkey). Fur, red above; white beneath; extremities olivaceous above; gray beneath; lower part of the nose white.

*Simia petaurista*, *Gmelin, Sys. Nat.* 35. *Cercopithecus petaurista*, *Geoff. Ann. Mus.* xix.

Le Blanc nez. *Buffon Supp.* vii. 67. L'Ascagne. *Audeb. f.* 4, §. 2. The vaulting monkey. *Shaw, Zool.* 51.

*Icon. Audeb. Hist.* 4. §. 2. f. 14, 15. *Schreb. t.* 19. B. Inhabits Guinea.

29. 9. *S. C. ruber* (Red Monkey). Fur, red above; ash-colour beneath; with a narrow black or white band over the eyes.

*Simia rubra*. *Gmelin, Sys. Nat.* 24. *S. Patas*, *Schreb.* 46. *S. rubra*. *Schreb. t.* 16. B. *Cercopithecus ruber*, *Geoff. Ann. Mus.* xix. 96.

Le Patas, *Buff.* xiv. t. 25 et 26. Red Monkey, *Penn. Quad.* 208.

*Icon. Buffon* xiv. t. 25, 26. *Schreb. t.* 16. 16. B.

Inhabits Senegal, commonly called the *Red Monkey of Senegal*.

30. 10. *S. C. Diana* (Palatine Monkey). Fur back bright chestnut, sides slate gray, with an oblique line of the same colour on the thighs.

*Simia Diana*, *Lin. Sys. Nat.* 38. Roloway, *Gmelin, Sys. Nat.* 35. *S. Diana faunus*. *Lin. Sys. Nat.* 38. *Cercopithecus Diana*. *Geoff. Ann. Mus.* xix. 96.

Exquima, *Marcgrave*. Roloway, *Buff. Supp.* vii. Palatine Monkey, *Penn. Quad.* 200. Spotted Monkey, *Penn. Quad.* 201. La Diane, *Audeb. Hist.* 4. § 2.

*Icon. Buff. Supp.* vii. f. 20. *Audeb. Hist.* 4. § 2. f. 6. *Schreb. t.* 25.

## SYNOPSIS OF THE

Inhabits Africa, especially near Congo and Guinea.

31. 11. *S. C. Albocinereus*. Fur, gray above; deeper on the arms; whitish below, with a line of ridged black hairs traversing the forehead; hands black; tail brown.

*Cercopithecus albocinereus*, *Desm. Mamm.* 534.

Icon.

Inhabits Sumatra.

XI. CERCOCEBUS.—Geoffroy, *Facial angle* 45°, *head triangular*; *muzzle longish*; *the upper orbital edge rising again and cut internally*; *nose flat and convex*; *the thumbs of the anterior hands thin, rather close to the fingers, those of the hinder larger and more distant*; *the buttock with very large callosities*; *tail longer than the body*; *cheek pouches distinct*.

32. 1. *S. C. Cynosurus*, (the Malbrouck). Fur, olive brown above, whitish beneath, with a whitish band over the eyes.

*Simia cynosurus*, ♂ *Gmelin, Sys. Nat.* 30. *S. faunus* *Lin. Sys. Nat.* 36. *Cercocebus cynosuros*. *Geoff. Ann. Mus.* XIX. 96.

Malbrouc, *Buffon*, XIV. *Jeune Callitriche*, *Audeb. Hist.* 4. § 2. t. 5. Dog-tailed Baboon. *Shaw*, 32.

Icon. *Scop. Delic. t.* 19. ♂—*Schreb. t.* 14. *B. Buff.* XIV. t. 29 ♀ *Audeb. Hist.* 4. § 2. f. 5.

Inhabits Bengal.

Obs. M. Cuvier considers the *S. talapoin* (n. 22.,) to be only a young individual of this species.

33. 2. *S. C. Sabæus* (Callitrix, or Green Monkey). Fur, olive green above; dirty white beneath; head pyramidal; face black; cheeks with long hairs; scrotum copper green, surrounded by yellow hairs; end of the tail, yellow.

*Simia Sabæa*. *Lyn. Sys. Nat.* 1. 38. *Cercopithecus Sabæus*, *Geoff. Ann. Mus.* XIX.

Singe Vert, *Bris. Règ. An.* 205: *Callitriche*, *Buff.* XIV. 272.

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Green Monkey, *Penn. Quad.* 203. The St. James's Monkey, *Edw. Glean.*

Icon. *Buff.* xiv. t. 37. *Audeb. Hist.* 4. § 2. f. 4. *Cuv. Menag. Mus.* 4. t. 18. *F. Cuv. Mam. t.* — *Edw. Glean,* t. 215. *Schreb. t.* 18.

Inhabits the Mauritius, Senegal, and the Island of Cape Verd.

34. 3. *S. C. Griseo-viridis* (the Grivet). Fur greenish gray; scrotum copper green, surrounded with white hairs; head pyramidical; tail entirely gray.

*Cercopithecus Griseo viridis*, *F. Cuvier.*

Le Grivet, *Fred. Cuvier, Mam.*

Icon. *F. Cuvier, Mam.*

Inhabits Africa.

Obs. Like the *C. Cynosurus*, (n. 25.) but differs in the head not being so round, the scrotum green, not bright blue, fringed with orange; and from the *C. Sabæus*, in the want of the white band over the eye, and the lightness of the colour of the whole animal.

35. 4. *S. C. Pygerythræus*, (Red-vented Monkey). Fur greenish gray above; white beneath; scrotum gray green, surrounded with white hairs; vent surrounded with deep red; end of the tail black.

*Cercopithecus pygerythræus.* *F. Cuvier, Mam.*

Icon. *F. Cuvier, Mam. Lithog.*

Inhabits Cape of Good Hope.

6. 5. *S. C. Fuliginosus* (the Mangabey, or white eye-lid monkey). Gray slate brown, without any spot on its head or neck; upper eye-lids white.

*Simia Æthiops.* *Lin., Gmelin, Sys. Nat.* 33. *Cercocebus Fuliginosus,* *Geoff. Ann. Mus.* xix. 97.

White eye-lid Monkey. *Penn. Quad.* 204. *Shaw,* 43. Mangabey. *Buffon,* xiv. t. 344.

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Icon. *Schreb.* t. 20. *Buffon.* xiv. t. 33. *Audeb.* 4. § 2. f. 10  
*Ency. Méth.* t. 13. f. 3. *Shaw,* 1. t. 20. *F. Cuv. Mam.* t. —  
 Inhabits Ethiopia.

37. 6. [*S. C. Æthiops* (the Collared Mangabey). Fur wine brown, top of the head red; upper eye-lid white, and with a white band parting the eyes and proceeding to each side of the back of the neck.

*Simia Æthiops.* Var. *Gmelin,* *Cercocebus Æthiops.* *Geoff. Ann. Mus.* xix. 97.

Mangabey à collier blanc. *Buff.* xiv.

Icon. *Buff.* xiv. t. 33. Var. 11; *Audeb. Hist.* 4. § 2 f. 10. *Schreb.* t. 21.

Inhabits Ethiopia.

38. 7. *S. C. Atys* (the Atys). Fur entirely white; face and hands flesh-coloured; ears nearly square.

*Simia Atys.* *Audeb. Hist.* 4. § 2. *Schreb.* *Cercocebus Atys,* *Geoff. Ann. Mus.* xix. 99.

Icon. *Audeb. Hist.* 4. § 2. f. 8. *Schreb.* t. 14. B.

Inhabits — ?

Obs. Most probably an Albino of some other species, but if so the type is unknown.

XII. MACACUS.—*Lacépède.* *Facial angle of 40. 45°; superciliary and occipital ridges very distant; tail shortish; cheek-pouches, and callosities distinct; ears angular.*

39. 1. *S. M. Silenus* (the Ouanderou). Fur black; belly gray; mane and beard large; tail gray, largish, ending in a tuft of hairs.

*Simia Silenus,* of *Lin. Sys. Nat.* 36. 1. *S. Leonina,* *Gmelin Sys. Nat.* *S. ferox,* *Shaw, Mus. Leverianum,* 69. *Papio-silenus.* *Geoff. Ann. Mus.* xix. 102.

Ouanderou, *Knox's Ceylon.* *Buff.* xiv. t. 18. *Macaque à crinière.* *Cuv. Règ. Anim.* 1. 108. *Lion-tailed baboon,*

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*Pennant. Quad* 198. Nij-bundar of *Hindus*.

Icon. *Buff.* xiv. t. 18. *Audub. Hist.* 2. § 1. f. 3. *Pennant, Quad.* t. 44. *Shaw, Zool.* 1. t. 16. *Schreb.* t. 11.

Inhabits Ceylon.

40. 3. *S. M. sinicus*. (Chinese monkey). Fur chestnut brown, the hairs on the crown of the head diverging from the centre to the circumference and placed in the shape of a cap.

*Simia sinicus*, *Gmelin, Sys. Nat.* 94. *Cercocebus sinicus*, *Geoff. Ann. Mus.* xix. 98. *Macacus sinicus* *Desm. Mamm.* 64.

Bonnet-chinois, *Buffon*, xv. 224. Chinese monkey, *Pennant, Quad.* 209.

Icon. *Buff.* xiv. t. 30. *Audub.* 4. f. 2 11. *Shaw. Zool.* 1. t. 20. *Schreb.* t. 23.

Inhabits Ceylon.

*Obs.* This species is very closely allied to the cercopithecii both in characters and habits, and Cuvier considers it to be the full grown *S. C. Pileatus*, (n. 25.)

41. 3. *S. M. radiatus*. (Radiated monkey). Greenish brown above, clear ash colour beneath, hairs at the crown of the head diverging and forming a cap.

*Cercocebus radiatus*, *Geoff. Ann. Mus.* xix. 984.

Macaque foqué, *Desm. Mamm.* 64.

Icon.

Inhabits India.

*Obs.* M. Geoffroy considers it doubtful whether this species belongs to the *Macaci*, or to the *Cercocebi*.

42. 4. *S. M. cynomolgus*. (Hare-lipped monkey) Fur, greenish brown or olivaceous above and grayish white beneath; margin of the orbits of the males very prominent; middle of the forehead of the female ornamented with an elevated tuft of hairs.

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*Simia cynomolgus*, *Lin. Sys. Nat.* 1. 38. *S. cynocephalus*, *Lin. Sys. Nat.* 1. 38.? *Cercocebus cynomolgus* and *C. cynocephalus*, *Geoff. Ann. Mus.* XIX. 99. *Macacus cynomolgus*, *Desm. Mam.* 65.

Hare-lipped monkey, *Pennant Quad.* 200. Macaque, *Buff.* XIV. 190. Aigrette. *Buff.* XIV. 190. Macaque ordinaire, *Desm. sp.* 34.

Icon. *Buff.* XIV. t. 21. *Ency. Méthod.* t. 14. f. 1.

*F. Cuvier, Mam. Shaw. Zool.* t. 16.

Inhabits Guinea and the interior of Africa, often brought to Europe.

XIII. PITHECUS, Gray. *Facial angle of 40. 45°; superciliary and occipital ridges very distinct; tail very short or only a small tubercle; cheek pouches and callosities distinct, ears angular.*

4 1. *S. P. rhesus* (the pig-tailed baboon). Fur, greenish gray above;—tail short and wrinkled at its base; buttocks golden yellow; extremities gray.

*Simia erythrea*, *Schreb.*—*S. Monachus*, *Schreb. t. 15 B. ?* *Pithecus rhesus*, *Geoff. Ann. Mus.* XIX. 101. *S. Nemes-trina*, *Shaw, Zool.* 1. 25.

*Patas à queue courte*, *Buff. suppl.* VII. *Macaque à queue courte*, *Buff. Suppl.* VII. *Rhesus. Audeb. Hist.* 2. § 1. t, 3. *Pig-tail Baboon. Pennant. Quad.* 14. t. 19. *Macaque maimon, Desm. sp.* 35.

• Icon. *Buff.* XIV. t. 19, bad. *Suppl.* VII, t. 14. 13. (1.) *F. Cuvier, Mam. t.*—*Ency. Méth.* t. 7, f. 2. *Audeb. Hist.* . § 1. t. 4. and 3. *Schreb. t. 8, D. (1.) Shaw. Zool.* 1. t. 41. (1)

Inhabits East Indies, and on the banks of the Ganges.

44. 2. *S. P. nemestrinus*, (Brown Baboon.) Fur, deep brown above with the middle of the head and back; tail

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small, thin, half the length of the thighs; head and extremities yellowish.

*Simia nemestrina*, *Lin. Sys. Nat.* 35. *S. platypygos*, *Schreb. t. 5. B. S. fusca*, *Shaw, Zool.* 1. 24.

*Pithecus*, *Geoff. Ann. Mus.* XIX. 101.

Babouin à longues jambes, *Buff. Supp.* VII. Macaque, *Cuvier, Dict. Sci. Nat.* Brown Baboon, *Pennant, Quad.* 192. Pig-tailed Monkey, *Edwards, Glean. f.* 214. Macaque Orion, *Desm. sp.* 36.

Icon. *Buff. Supp.* VII. t. 8. *Ency. Méth.* t. 10. f. 20. *Schreb. t. 9. Edw. Glean. t.* 214. *Shaw, Zool.* 1, f. 13. *Griffith, Vert. Anim. t.* 25.

Inhabits Java, Sumatra.

45. 3. *S. P. inuus*, (the Pygmy, or Barbary ape). Fur greenish gray; a small tubercle in the place of a tail.

*Simia inuus*, *Lin. Sys. Nat.* 35. *S. silvanus*, *Lin. Sys. Nat.* 1. 34 (*Junior*). *S. Pithecus*, *Schreb. Macacus indicus*, *Desm. Mamm.* 67.

*Pithecus*, *Aristotle.* *Cynocephalus*, *Prosper.* *Simia*, *Ray.* *Pithèque*, *Buff. Supp.* VII. *Magot*, *Buff.* XIV. *Barbary Ape* *Pennant, Quad.* 186. *Pygmy Ape*, *Pennant, Quad.* 183. *Alpinus Ape*, *Shaw, Zool.* 1. 14. *Magot or Barbary Ape*, *Griff. Quad.*

Icon. *Buff.* X. IV. t. 8, 9, *Supp.* VII. t. 2, f. 4, 5. *Audeb.* 1, § 3, t. 1. *F. Cuvier, Mam. Ency. Méth.* t. 6, f. 3, 3a. et. 1. *Shaw, Zool. t.* 7, 8. *Spec. Lin.* 1. t. 1. *Schreb. t.* 4, 5, et 4 B. *Griffith. Quad. t.* 23.

Inhabits Barbary, Egypt, and the rock about Gibraltar in Spain.

XIV. CYNOCEPHALUS.—Brisson. *Facial angle of*  $30=35^{\circ}$ ; *superciliary and occipital ridges very prominent; muzzle long and truncated at the end; canine teeth strong; cheek-pouches and callosities distinct; tail as long or longer than the body.*

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46, 1. *S. C. Babouin*, (Little Baboon). Fur greenish yellow; face livid, flesh colour; cartilage of the nose not exceeded by the bones of the upper jaw.

*Simia cynocephalus*, *Lin. Sys. Nat.* 38. *Papio cynocephalus*, *Geoff. Ann. Mus.* XIX. 102. *Cynocephalus babouin*, *Desm. Mam.* 63. *Cynocephalus*, *Plinii*. *Cercopithecus*, *Johnst. Quad.*

Petit papion, *Buff.* XIV. Babouin, *F. Cuvier, Mam.*

Icon. *John. Quad.* t. 59, last fig. *Buff.* XIV. t. 14. *F. Cuv. Mammi. Lithog. Ency. Méthod.* t. 9, f. 1, 2.

Inhabits Northern Africa.

47. 2. *S. C. papio* (Guinea Baboon). Fur yellowish brown; face entirely black; cartilage of the nose exceeding the jaws at their upper extremity; upper eye-lids white.

*Simia cynocephalus*, *Brongn. Jour. Hist. Nat.* *Cynocephalus Papio*, *Desm. Mam.* 69.

Papion, *Buff.* XIV.

Icon. *Brongn. l. c. Schreb.* t. 13, B. copied *Brong. Buff.* XIV, t. 13. *Audeb. Hist.* 3, § 1. f. 1, *Ency. Méthod.* t. 6, f. 4.

Inhabits shores of Guinea.

48. 3. *S. C. porcarius* (Pig-faced Baboon). Fur greenish black above, with a mane of large hairs on the neck; face violet black; paler under the eyes, and white on the upper eyelid.

*Simia porcaria*, *Lin. Gmelin, Sys. Nat.* *S. ursina*, *Pennant?* *S. sphingiola*, *Herman?* *Papio comatus*, et *P. porcarius*, *Geoff. Ann. Mus.* XIX. 102, and 103. *Cynocephalus porcarius*, *Desm. Mam.* 69.

Guenon à face alongée, *Buffon*. Singe noir, *Vaillant*. Choak kama, *Kolbe*. Chacma, *Fred. Cuv. Mam.* Papion noir, *Cuv. Rêg. An.* 110.

Icon. *Boddart, Nat. Forst.* XII. t. 1, 2; *Ency. Méth.* t. 8, f. 4? *F. Cuvier, Mam.*

Inhabits the Cape of Good Hope.

49. 4. *S. C. Hamadryas* (Gray Baboon). Fur ash-coloured, beard and mane very long, face flesh-coloured; hands black.

*Simia hamadryas*, *Lin. Sys. Nat.* 36. *Cynocephalus hamadryas*, *Desm. Mam.* 70.

*Cynocephalus*, *Gesner*, 862 *Clus. Exot.* 370. Tartarin *Bellon*, 101. Babouin à museau de chien, *Buff. Supp.* VII. 47. Singe de Moco, *Buff.* XIX. Papion à Perruque, *Cuv. Règ. An.* 110. Dog-faced Ape, *Penn. Quad.* 194. Dog-faced Baboon, *Shaw, Zool.* 1. 28. Gray Baboon, *Shaw Spec. Lin.* 1. t. 3.

Icon. *Bellon Dis.* 101. *Prop. At.* t. 17, 19. *Edw. Glean. t.*—*Schreb. t.* 10. *Shaw, Zool.* 1 t. 15; *Spec. Lin.* t. 32. *F. Cuvier, Mam. t.* — *Griff. Quad.* t 28.

Inhabits Moco, Persian Gulf, and Arabia.

XXV. PAPIO.—*Brisson. Facial angle, of 30. 35°, superciliary and occipital ridges very prominent, muzzle long, and truncated at the end, canine teeth strong, cheek-pouches and callosities very distinct, tail very short, and perpendicular to the dorsal line.*

50. 1. *S. P. Mormon* (the Mandrill). Fur olivaceous gray, brown above; white beneath, beard yellow; face blue, and the nose red, in the adult males.

*Simia sphinx*, *Lin. Sys. Nat.* 35. *S. Mormon*, *Gmel. Sys. Nat.* *Cynocephalus mormon*, *Desm. Mam.* 70.

*Papio sus*, Baboon, *Gesner, Quad.* 252. Choras, *Buff. Supp.* VII. Mantegar, *Phil. Trans. n.* 220, *Bradley, Nat.* 117. Mandrill, *G. Cuvier, Ménag. Mus.* Great Baboon, *Penn. Quad.* 188. Variegated Baboon, *Shaw, Zool.* I. 17. Boggo, *Travel*

Icon. *Gesner, t.* 253. *Bradley, Nat. t.* 15. *f. 1. Buffon, Supp.* VII. t. 9. *Penn. Quad. t.* 40, 41. *Mus. Lever. 35. t.* 9. *Shaw, Zool. I. t.* 10, *F. Cuv. Mam. t.*

*Junior Simia Maimon*, *Lin. Sys. Nat.* 35. —

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Le Mandrill, Buff. xiv. Maimon, Shaw, Zool. i. 20. Ribbed nose Baboon, Penn. Quad. 190.

Icon. Schreb. i. t. 7. Buff. xiv. t. 16. 17. Audeb. Hist. 2. § 2. f. 1. Shaw, Spec. Lin. 1. t. 2. i. Zool. 1. t. 11.

Inhabits Africa, on Gold and Guinea Coasts.

51. 2. *S. P. leucophæus* (the Drill). Fur, brownish green, gray above; white beneath; face (in both sexes and at all ages), uniform deep black.

*Simia Leucophæa*. F. Cuvier, Ann. Mus. ix. *Cynocephalus Leucophæus*. Desm. Mam. 71.

Drill. F. Cuvier, Mamm. Wood Baboon. Griff. Quad. t. 20?

Icon. Ann. Mus. ix. t. 37. F. Cuv. Mam. t. — Griffith, Quad. t. 29?

Inhabits Africa?

The three following species of Pennant have great affinity to this species *if really distinct*.

52. 3. † *S. P. Sylvicola* (Wood Baboon). Fur ferruginous brown; face and hands black.

*Simia Sylvicola*. Mus. Lever. 201.

Le Babouin des Bois. Buff. Sup. vii. 39. Wood Baboon. Penn. Quad. 191.

Icon. Penn. Quad. t. 42. Shaw, Zool. 1. t. 12; Mus. Lev. t. 1. Buff. Sup. vii. t. 7.

Inhabits Africa, near Guinea.

53. 4. † *S. P. Sublutea* (Yellow Baboon). Fur yellow, freckled with black; face black, naked; hands above hairy.

*S. Sublutea*. Shaw, Zool. 1. 23.

Yellow Baboon. Pen. Quad. 191.

Inhabits Africa.

54. 5. † *S. P. Cinerea* (Cinereous Baboon). Fur

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cinereous, crown of the head mottled with yellow; face brown, beard pale.

*S. Cinerea.* *Shaw Zool.* 1. 23.

Cinereous Baboon. *Pen. Quad.* 87.

Inhabits Africa.

55. 6. † *S. P. Pennantii* (Pennant's Baboon). Fur black, and ash-colour, varied with reddish; face blue; beard pale brown, with a tuft of hairs over each eye, and on each ear.

Baboon. *Pennant Quad.*

56. 7. *S. P. Apedia* (Thumbless Baboon). Fur greenish brown; the thumb of the anterior extremities close to the palm; claws depressed; other claws oblong compressed.

*Simia Apedia.* *Lin. Sys. Nat.* 1. 35.

Inhabits India, size of a Squirrel.

*Obs.* This species is only known by Linnæus' specific characters.

57. 8. *S. P. Niger* (Black Baboon). Fur entirely black; hair woolly, except on the crown of the head, where they are long, and form a tuft on the occiput. Tail none?

*Cercopithecus Niger.* *Desm. Mamm.* 534.

Icon.

Inhabits one of the Islands of the Indian Archipelago.

*Obs.* If this species, which is described from a mutilated specimen in the French museum, really have no tail, it will form a new section\*.

\* Cuvier placed after this Genus the Pongo, which he at the same time observed might be the young of the Orang-Outang, next to which we have placed it.

## SYNOPSIS OF THE

### AMERICAN MONKEYS.

FORMING THE SECOND PRINCIPAL SUB-GENUS OF CUVIER.

FORM approaching that of man. Cutting teeth 4, cheek teeth  $\frac{6.6}{6.6}$ , bluntly tubercular, or  $\frac{2.5}{5.5}$  acutely tubercular; nostrils separated by a broad septum and opening laterally; teats two, pectoral; tail long, usually prehensile, cheek, pouches or callosities none.

**L. ATELES, Geoffroy.** *Facial angle of 60°, head round, limbs very thin, anterior hands destitute of thumbs, tail very long, powerfully prehensile, having the lower part of its extremity naked.*

58. 1. *S. A. Paniscus* (the Coaita). Black; face nearly naked, copper coloured; no thumb to the anterior hands.

*Simia paniscus. Lin. Sys. Nat. 37. Ateles paniscus. Geoff. Ann. Mus. vii. 269. xvi. 105.*

Quatto, *Vosm. 1768. Coaita, Buff. xv. 16. Four-fingered monkey, Penn. Quad. 216.*

*Icon. Buff. xv. t. 1. Audeb. Hist. 5. § 1. f. 2. F. Cuv. Zoon.—Ency. Méthod. p. 16. f. 1. Schreb. t. 26. Shaw, Z. of. 1. t. 28.*

Inhabits Guyana and Brazil.

59. 2. *S. A. niger*, (the Black Coaita). Fur black; face hairy, black; no thumb on the anterior hands.

*Ateles niger, F. Cuvier, Mamm.*

*Atèle coaita de Cayène, Geoff. Ann. Mus. XIII. 97.*

Inhabits Guyana.

*Icon. F. Cuvier, Mamm. Lithog. n. 39. t. 1*

Inhabits Guyana.

60. 3. *S. A. Belzebuth* (The Marimonda). Fur black, belly dirty white or yellowish in the male, and white in the young or females.

*Ateles Belzebuth, Geoff. Ann. Mus. vii. 271. xix. 106.*

*Le Belzebuth, Brisson, Règ. Anim. 1. 211. Marimond*

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*Humb. Obs. Zool.* 325. Coaita à Ventre blanc, *Cuvier. Règ Anim.* 1. 113.

Icon. *Geoff. Ann. Mus.* vii. p. 16.

Inhabits the banks of the Orinoco.

61. 4. *S. A. Marginatus* (The Chuva). Black, with a white ruff round the face.

*Ateles Marginatus*, *Geoff. Ann. Mus.* xiii. 9. xix. 106.

Chuva, *Humb. Zool. Obs.* 340.

Icon. *Geoff.* xiii. p. 9.

Inhabits the banks of the Santiago and Amazon.

62. 5. *S. A. Arachnoides* (the spider monkey). Yellow-gray, fur soft, eye-brows black, long; without any thumb on the anterior hands.

*Ateles arachnoides*, Spider Monkey, *Edwards, Brown, Geoff, Ann. Mus.* xiii. 90. xix. 109.

Icon. *Geoff. Ann. Mus.* xiii. t. 9.

Inhabits Brazil?

63. 6. *S. A. Melanochir* (Black-handed Coaita). Gray; back of the head, the extremities of the limbs, and an oblique spot, on the outside of each knee of a brown, black, or gray brown.

*Ateles melanochir*, *Desm. Mamm.* 76.

Inhabits — French Museum.

64. 7. *S. A. Hypoxanthus* (The Miriki). Yellowish gray, face flesh colour, spotted with gray; base of the tail and buttocks sometimes yellow ferruginous, the thumb of the anterior hands merely rudimentary and without a nail.

*Ateles hypoxanthus*, *Kuhl. MSS. Desm. Mamm.* 72. Miriki, and Mono, *Brazilians.*

Inhabits Brazil. Prince Maximilian's Museum.

65. 8. *S. A. Subpentadactylus* (the Chameck). Black; the thumb of the anterior hands very small, and without a nail.

*Ateles pentadactylus*, *Geoff. Ann. Mus.* vii. 267, and xix. 105. *Ateles subpentadactylus*, *Desm. Ram.* 73.

SYNOPSIS OF THE

Chameck, *Buff.* xv. 21. *Humboldt, Zool. Obs.*

II. LAGOTHRIX. *Humboldt. Facial angle of 50°; head round, the limbs proportioned to the body, anterior hands provided with a thumb. Tail strongly prehensile, with the lower part of the extremity naked.*

66. 1. *S. L. Humboldtii* (The Capparo). Blackish ash-colour, hairs long.

*Simia lagothericha, Humb. Obs. Zool. 32. Lagotherix Humboldtii. Geoff. Ann. Mus. xix. 107.*

Icon. —

Inhabits the Banks of the Rio Guariara.

67. 2. *S. L. Canus* (Silver-haired Monkey). Olivaceous gray; head, hands, and tail red-gray; hairs short.

*Lagotherix Canus. Geoff. Ann. Mus. xix. 107.*

Icon. —

Inhabits Brazils.

III.—MYCETES.—*Illiger. Facial angle 30°; head pyramidal; visage oblique; os hyoides very ventricose, outside prominent; the anterior hands provided with a thumb; tail very long, naked at the lower part of the extremity.*

68. 1. *S. M. Seniculus* (The Mono Colorado, or Red Howling Monkey). Upper part of the body fire-red; head, extremities, and tail very lively deep red; face naked, black.

*Simia seniculus, Lin. Sys. Nat. 37. Mycetes seniculus, Illiger, 70. Stentor seniculus, Geoff. Ann. Mus. xix. 107.*

*Alouate, Buff. xv. Mono colorado, Humb. Obs. Zool. 342. Royal Monkey, Penn. Quad. 215.*

Icon. *Buff. xv. t. 5. Suppl. vii. t. 15. Audeb. Hist. 5. f. 1. Schreb. t. 25. b. Griff. Quad. t. 27.*

Inhabits Guyana, near Carthage; the Banks of the river Saint Magdeleine, and Brazil.

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69. 2. *S. M. Ursinus* (The Araguato). Uniform golden-red; face partly covered with hairs.

*Stentor ursinus*, *Geoff. Ann. Mus.* xix. 108. *Mycetes ursinus*, *Desm. Mamm.* 78.

Araguato, *Humb. Obs. Zool.* 329.

Icon. *Humb. Obs. Zool. f.* 30.

Inhabits the Province of Venezuela, New Andalusia, New Barcelona, and the Shores of the Orinoco and Brazil.

70. 3. *S. M. Stramineus* (The Arabata). Fur straw-yellow; hairs in the middle yellow, with the base and apex brown.

*Stentor stramineus*, *Geoff. Ann. Mus.* xix. 108. *Mycetes stramineus*, *Desm. Mamm.* 78.

Arabata, *Gumil. Oren. f.* 295.

Icon. —

Inhabits Para.

71. 4. *S. M. Fuscus* (The Guariba). Fur chestnut-brown; back and head becoming chestnut; the extremities of the hairs golden.

*Simia belzebuth*, *Lin. Sys. Nat.* 37. *Stentor fuscus*, *Geoff. Ann. Mus.* xix. 108. *Mycetes fuscus*, *Desm.* 79.

Guariba, *Margr. Brazil.* 226. Ouarin, *Buff.* xv. 5. Preacher Monkey, *Penn. Quad.* 214.

Icon. *Marg. Braz.* 226. *Buff. Suppl.* vii. t. 26. *Ency. Method.* t. 15. f. 4.

Inhabits Brazil.

72. 5. *S. M. Flavicaudatus* (The Choro). Fur blackish-brown, darker on the back; tail, with two yellow stripes on each side.

*Stentor flavicaudatus*, *Geoff. Ann. Mus.* xix. 108. *Mycetes flavicaudatus*, *Desm. Mamm.* 79.

Choro, *Humb. Obs. Zool.* 343.

Icon. —

Inhabits New Grenada and the Banks of the Amazon.

SYNOPSIS OF THE

73. 6 *S. M. Niger* (The Caraya). Fur fine black in the males; with the sides and lower part of the body yellow on the young and females.

*Stentor niger*, Geoff. Ann. Mus. xix. 108. *Mycetes niger*, Desm. Mamm. 79.

Caraya, Azara, Quad. Parag. VII. 208. Humboldt. sp. 11.  
Icon. ———

Inhabits Paraguay, Bahia, and the interior of Brazil.

74. 7. *S. M. Rufimanus* (the Red-handed Howler). Black, hands and end of the tail red, face and lower part of the body naked.

*Mycetes rufimanus*. Kuhl. MSS. Desm. Mamm. 79.

Icon.

Inhabits ———. Formerly Bullock's Museum, now in M. Temminck's.

IV. *CEBUS*, Erxleben. Facial angle  $60^{\circ}$ ; head round, muzzle short, the os hyoides not prominent; tail prehensile, hairy at the lower part of the end\*.

75. 1. *S. C. Robustus*. Fur brown, upper part of the head, neck, and a line surrounding the face, black, arms clear yellow, lower part of the neck and belly reddish chestnut in the males, and of a pale yellowish brown in the young and females.

*Cebus robustus*, Kuhl. MSS. Desm. Mamm. 80.

Icon. ———

Inhabits Brazil.

76. 2 *S. C. Apella* (The Weeper Monkey). Fur brown,

\* The species proper to this subdivision have but little distinctive character, and authors differ considerably as to their real number. Brisson described three, Linnæus four, Gmelin six, Buffon two, and finally the Baron Cuvier inclines to the opinion that there is but one. Pending this uncertainty, we shall, in conformity with our general plan, notice the several species as indicated by previous writers, together with their synonyms, with this general-observation as to the uncertainty of their distinctiveness.

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deeper above and paler beneath ; top of the head, tail and feet blackish-brown ; face brown, surrounded by blackish-brown hairs ; outer part of the arms and lower part of the neck yellowish-brown.

*Simia apella*, *Lin. Sys. Nat.* 42. *Cebus apella*, *Desm. Mam.* 71.

Sajou brun. *Buff.* xv. Sajou *Audeb. Hist.* 5. § 2.

Icon. *Buff.* xv. t. 4. *Audeb. Hist.* 5. § 2. t. 2. *Ency. Méth.* f. 2. *Schreb.* t. 28.

Inhabits Guyana and Terra Firma.

77. 3. *S. C. Griseus* (The Gray Sajou). Fur yellow-brown, variegated with grayish above, and clear yellow beneath ; head capped with black ; beard none ; face surrounded with brown-black hairs ; and sometimes white under the neck and chest.

*Cebus barbatus*, *Geoff. Ann. Mus.* xix. 110. *C. griseus*, *Desm. Mam.* 81.

Sajou gris, *Buff.* xv. Sajou, *F. Cuvier Mam.*

Icon. *Buff.* xv. t. 5. *Ency. Méthod.* t. 16. f. 3. *F. Cuv. Mam.*

Inhabits—— ?

78. 4. *S. C. Barbatus* (The Bearded Sapajou). Fur reddish-gray ; belly red ; beard prolonged on the cheeks ; hairs long and soft.

*Cebus barbatus*, *Geoff. Ann. Mus.* xix. 112. *C. albus*, *Geoff. Ann. Mus.* xix. 112. (2.)

Sai var. *Audeb. Hist.*

Icon. *Audeb. Hist.* 5. § 2. t. 6. *Ann. Mus.* xix. f. 12. (2.)

Inhabits Guyana.

This species varies from gray to white, according to its age and sex, from whence the *C. albus* of Geoffroy.

79. 5. *S. C. Frontatus* (The Fearful Monkey). Fur nearly uniform brown-black, with the top of the head and the extremities of the limbs darker ; hairs of the forehead quite

SYNOPSIS OF THE

straight, elevated perpendicularly; with some scattered white hairs round the mouth, and on the anterior hands.

*Simia trepida*, *Lin. Sys. Nat.* 39? (1.) *Cebus trepidus*, *Geoff. Ann. Mus.* xix. 110? (1.) *C. frontatus*, *Kuhl. MSS. Desm. Mam.* 82.

Tufted-tailed ape. *Edw. Glean.* Fearful monkey, *Penn. Quad.*

Icon. *Edw. Glean.* 312? (1.) copied. *Ency. Méth.* t. 17. f. 43.

Inhabits.— Mus. Paris.

The specimen from whence the above description was taken by Dr. Kuhl, is very like that figured by Edwards, but the white hairs were not so abundant.

80. 6. *S. C. Niger* (the Black Sapajou). Fur deep brown; face, hands and tail black; forehead and hinder parts of the cheeks covered with yellowish hairs.

*Cebus niger*, *Geoff. Ann. Mus.* xix. 111. *Cebus apella* var. *Humboldt, Zool. Obs.* 323.

Sapajou nègre, *Buffon, supp.* vii. Sajou brun. var. *Humb.*

Icon. *Buff.* vii., t. 18, copied *Ency. Méthod.* t. 8. f. 4.

Inhabits —

81. 7. *S. C. variegatus* (the varied Sapajou). Fur blackish, sprinkled with golden yellow; belly reddish; hairs of the back of three colours, the roots brown, then red, and the apex black; the fur very soft and formed of very long woolly hair; head round; muzzle prominent; with the space between the eyes blackish brown.

*Cebus variegatus*, *Geoff. Ann. Mus.* xix. 111.

Icon. —

Inhabits —

82. 8. *S. C. fulvus* (the yellow Sapajou). Fur entirely fulvous; hair silky, straight, not waved.

*Simia flavus*, *Schreb.* *Cebus flavus*, *Geoff. Ann. Mus.* xix. 112. *C. fulvus*, *Desm. Mam.* 83.

Icon. *Schreb.* t. 31, B.

SPECIES OF MAMMALIA.

Inhabits the Brazils.

When young the upper part of the head is red, the dorsal line, tail and limbs, chestnut red, with the rest yellow.

83. 9. *S. C. albifrons* (the Ouavapavi). Fur gray, paler beneath; top of the head black; forehead and orbits white; and extremities yellowish brown.

*Cebus albifrons*, *Humboldt, Obs. Zool.* 323. *Geoff. Ann. Mus.* xix. 111.

Sapajou Ouavapavi, *Humboldt, Obs. Zool.*

Icon.

Inhabits the vicinity of the Orinoco, in troops.

84. 10. *S. C. lunatus*, (the Spectacle Sapajou). Fur blackish; head, forehead, and anterior extremities black; with a white band across each cheek, joining the eye-brow with the angle of the mouth.

*C. lunatus* *Kuhl. MS. Desm. Mam.* 84.

Icon: —

Inhabits —

Museum of the Academy of Heidelberg.

85. 11. *S. C. xanthosternos* (the yellow chested sapajou). Fur chestnut; with the lower part of the neck and chest of a very pale reddish yellow.

*Cebus xanthosternos*, *Kuhl. MS. Desm. Mam.* 84.

Icon. —

Inhabits Brazil, between 15°. 30. south latitude, and the river Belém; *Prince Maximilian.*

86. 12. *S. C. fatuellus* (the Horned Monkey). Fur of the back chestnut; sides paler; belly bright red; extremities and tail black brown; with two strong brushes of hair elevated from the base of the forehead.

*Simia fatuellus*, *Lin. Sys. Nat.* 42. *Cebus fatuellus*, *Geoff. Ann. Mus.* xix. 109.

SYNOPSIS OF THE

Le Sajou cornu, *Buff. Supp.* vii. 100. The Horned Monkey, *Pennant, Quad.* 221.

Icon. *Buff. Supp.* vii. t. 29. *Ency. Méth.* t. 17, f. 3. *Audeb. Hist.* 5, § 2, f. 3. *Schreb.* t. 27, B. *Shaw, Zool.* t. 28. Inhabits Guyana.

87. 13. *S. C. cirrifer* (the crowned Sapajou). Fur chestnut brown; the crown of the head, extremities and tail, blackish brown; with a much elevated tuft of hairs in the shape of a horse shoe on the upper part of the forehead; head round.

*Cebus cirrifer*, *Geoff. Ann. Mus.* xix. 110.

Icon——.

Inhabits Brazil?

88. 14. *S. C. capucinus* (Capuchin Monkey). Fur from gray brown to olivaceous gray; crown of the head and extremities black; forehead, cheeks and shoulders, whitish gray.

*Simia capucina*, *Lin. Sys. Nat.* 42. *Cebus capucinus*, *Geoff. Ann. Mus.* xix. 111. *Callithrix capucinus*. *Illiger Prod.* 71.

*Sai. Buff.* xv. 51. Capucin monkey, *Pennant, Quad.* 218.

Icon. *Schreb.* t. 29. *Buff.* xv. t. 8. *Ency. Méthod.* t. 16. f. 4.

Inhabits Guyana.

89. 15. *S. C. hypoleucus* (the Cariblanco). Fur black; the forehead, sides of the head, throat, and shoulders whitish.

*Simia hypoleuca*, *Humb. prod.* 336? *Cebus hypoleucus*, *Desm. Mam.* 85.

*Sai à gorge blanche*, *Buff.* xv.

Icon. *Buff.* xv. t. 9. *Audeb. Hist.* 5, § 2, f. 8. *Ency. Méth.* t. 17. f. 1.

Inhabits Guyana.

SPECIES OF MAMMALIA.

V. *CALLITHRIX*, Cuvier. *Facial angle of 60°.*; head round; muzzle short; nostrils narrower than the range of upper cutting teeth; tail not prehensile, covered with short hairs; ears very large. Living in troops, springing from branch to branch, and eating fruit, eggs, or young birds.

90. 1. *S. C. sciureus* (the Squirrel Monkey or Caimiri). Fur olive gray; muzzle black; arms and legs bright red.

*Simia sciureus*, *Lin. Sys. Nat.* 43. *Callithrix sciureus*, *Geoff. Ann. Mus.* XIX. 113.

Saimiri, *Buff.* XV. Titi, *Humboldt. Obs. Zool.* 322. Orange Monkey, *Pennant, Quad.* 220. Squirrel Monkey, *Shaw. Zool.* I. 77. Caimeri, *South Americans.*

Icon. *Buff.* XV. t. 67. *Audeb. Hist.* 5, § 2. f. 7. *Ency. Méth.* t. 18. f. 1. *F. Cuvier, Mam.* t.—*Shaw*, t. 25.

Inhabits the Brazils and Guyana.

*Var. b.* Varied with red and black; double the size of the single coloured variety.

91. 2. *S. C. personata* (the Masked Monkey). Fur yellow gray; head and the four hands blackish; tail reddish.

*Callithrix personatus*, *Geoff. Ann. Mus.* XIX. 113.

The mask monkey of Dealers.

Icon.—

Inhabits parts of Brazil.

92. 3. *S. C. lugens* (the Widow Monkey). Fur blackish; throat and anterior hands white; tail a little longer than the body, black.

*Simia lugens*, *Humb. Obs. Zool.* 319. *Callithrix lugens*, *Geoff. Ann. Mus.* XIX. 113.

*La viduita*, *Humboldt.*

Icon.—

Inhabits the forests on the banks of the Cassiquiare.

93. 4. *S. C. amictus* (the ruffed Sagoin). Fur blackish

SYNOPSIS OF THE

brown; with a white half collar; the hands of the anterior extremities dull pale yellow; tail one-fourth longer than the body.

*Simia Amicta*, Humb. *Prod. Callithrix amictus*, Geoff *Ann. Mus.* xix. 114.

Icon.

Inhabits Brazil?

*Obs.* Dr. Kuhl considers the three last to be varieties of the same species.

94. 5. *S. C. torquatus* (the Collared Callitrix). Fur chestnut brown; yellow beneath; with a white half collar; tail a little longer than the body.

*Callithrix torquata*, Hoffmannsegg, *Naturf.* 1809, x. 86. *C. torquatus*, Geoff. *Ann. Mus.* xix. 114.

Icon. —

Inhabits Brazil.

*Obs.* Only known by Hoffmannsegg's description.

95. 6. *S. C. Moloch* (the Moloch). Fur ash-coloured, formed of annulated hairs above; temples, cheeks, and belly bright red; end of the tail and hands grayish white.

*Cebus Moloch*, Hoff. *Naturf.* 1809, x. 96. *Callithrix Moloch*, Geoff. *Ann. Mus.* xix. 114.

Icon. —

Inhabits Para.

96. 7. *S. C. Melanochir* (the black handed Sagein). Fur ash-coloured; hinder part of the back, loins, and extremity of the tail of a reddish brown, anterior hands sooty black.

*Callithrix melanochir*, Kuhl. *MSS. Desm. Mamm.* 88. *C. incanescens*, Lichtenstein, *MSS.*

Icon. —

Inhabits Brazil.

97. 8. *S. C. Infulatus* (Mitred Sagein) Fur, above gray,

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beneath yellowish red, with a large white spot, surrounded with black beneath the eyes; tail, origin reddish yellow, end black.

*Callithrix infulatus*, *Lichtenstein et Kuhls. MSS. Desm. Mamm.* 88.

Icon. —

Inhabits Brasil.

VI. AOTES, Humboldt. *Facial angle*—? *head round and large, muzzle short; ears very short; eyes large, close together; tail long, covered with short hairs.*

98. 1. *S. A. Trivirgatus* (the Douroucouli). Fur ash-coloured; belly yellowish red; with three parallel brown lines, extended from the forehead to the occiput,

*Aotus trivirgatus*, *Humboldt, Zool. Obs. tab.* 806.

*Cara rayada Missionaries of Orinoco*, Douroucouli, *Humboldt. l. 6.*

Icon. *Humboldt, Zool. Obs. tab.* 28, *Ency. Méthod. Supp. t. 1. f. 2. Griff. Quad. t. 14.*

Inhabits the thick forest of the Banks of the Cassiquiare, and upper Orinoco.

VII. PITHECIA, Desmarests. *Facial angle of 60°, head round; muzzle short; nostrils wider than the range of upper cutting teeth; ear moderately rounded; tail not prehensile covered with long hair; nocturnal. Called Night Apes.*

99. 1. *S. P. Satanus* (The Coucous). Fur, black brown on the males, red brown on the females; the hair of the head thick, covering the whole head and falling on the forehead; the beard very thick rounded; tail nearly as long as the body.

*Cebus Satanus. Hoff. Nat. Fors. x. 93. Pithecia Satanus, Geoff. Ann. Mus. xix. 116. Simia Sangulata, Trail. Wern. Trans. vii. 167?*

*Couxio, Humb. Obs. Zool. 314.*

SYNOPSIS OF THE

Icon. *Humb. Zool. Obs. t. 27.* copied *Ency. Méthod. Sup. t. 1. f. 4.* *Wern., Trans. VII. t. 9?*

Inhabits the banks of the Orinoco.

100. 2. *S. P. Chiropotes* (the Hand-drinking Saki). Fur reddish chestnut; the hair of the head thick separated in the middle and recurved into two distinct toupees, on each side of the head; beard long and tufted.

*Simia chiropotes, Humboldt. Zool. Obs. 113. Pithecia chiropotes, Geoff. Ann. Mus. XIX. 116.*

Capucin de L'Orinoque, *Humboldt. l. c.*

Icon. —

Inhabits the Desert of the Upper Orinoco and other parts of Guyana.

101. 3. *S. P. Rufiventer* (Fox-tailed monkey). Fur reddish brown; belly red; hairs brown at the origin, annulated with red and brown toward the extremity, hair of the head radiating on the top and bordering the forehead; beardless; tail nearly as long as the body.

*Simia pithecia, Lin. Sys. Nat. 40. Pithecia rufiventer, Geoff. Ann. Mus. XIX. 116.*

Saki, *Buff. xv. 90. Yärke, Singe de nuit, Buff. Supp. VII. 114. Fox-tailed monkey. Penn. Quad. 222.*

Icon. *Buff. xv. t. 12. Supp. vii. t. 30, 31. Ency. Méthod. t. 8. f. 3. Mus. Leverian. t. 5. Shaw, 1. t. 25. Griff. Quad. t. 13.*

Inhabits, French Guyana.

102. 4. *S. P. Miriquouina* (the Miriquouina). Fur, gray-brown above, cinnamon beneath; hairs of the back annulated black and white at each end; two white spots over each eye; beard none; tail a little longer than the body.

*Pithecia miriquouina, Geoff. Ann. Mus. XIX. 117.*

*Miriquouina Azara Hist. Paraguay, ii. 243.*

Icon. —

Inhabits the South Banks of the River Paraguay.

103. 5. *S. P. Rufibarba* (the Red bearded Saki). Fur,

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above black-brown, beneath pale red; pale red above the eyes; tail pointed at the end.

*Pithecia Rufibarba*, *Kuhl. MSS. Desm. Mam. 90.*

Icon. —

Inhabits Surinam. Mus. M. Temminck.

104. 6. *S. P. Ochrocephala* (Yellow-headed Saki). Fur, above of a clear chestnut, beneath yellowish red ash-colour; hands and feet black-brown; hairs of the forehead and circumference of the face of an ochreous yellow.

*Pithecia ochrocephala*, *Kuhl. MSS. Desm. Mamm. 91.*

Icon. —

Inhabits Guyana.

105. 7. *S. P. Monachus* (the Monk). Fur varied with large spots of brown and dirty yellowish white; hairs brown at their base, red and golden near the extremities; hair of the head radiating from the occiput and bordering the vertex; tail a little longer than the body; beard none.

*Pithecia monachus*. *Geoff. Ann. Mus. xix. 116.*

Saki Moine. *Desm. Mam. 91.*

Icon. *Buff. sup. vii. t. 30.*

Inhabits Brazil.

106. 8. *S. P. Leucocephalus* (the Yarke). Fur black; head surrounded with dirty white; each hair of only one colour; tail nearly as long as the body; beard none.

*Simia Pithecia*. *Lin. Sys. Nat. 40?* *Pithecia Leucocephala*. *Geoff. Ann. Mus. xix. 117*

Saki. *Buff. xv. 9. part*; Yarque. *Buff. sup. vii. not the figure.*

Icon. *Schreb. t. 32. Audeb. Hist. 6. § 1. f. 2. Buff. xiii t. 12.*

Inhabits Guyana.

107. 9. *S. P. Melanocephala* (the Cacajao). Fur yel-

SYNOPSIS OF THE

lowish brown; head black; beard none; tail one sixth shorter than the body..

*Simia Melanocephala.* *Humboldt. Zool. Obs.* 316. *Pithecia Melanocephala.* *Geoff. Ann. Mus.* XIX. 117.

Cacajao, caruíri, chacuro, and mono—raban *South Americans.*

Icon. *Humb. Obs. Zool.* t. 29.

Inhabits banks of the Cassiquira and Rio Negro.

Genus II.—OUISTITI or HAPALES.

FORM quadrupedal; cutting teeth  $\frac{1}{4}$ , canine  $\frac{1}{4}$ , grinders  $\frac{6-6}{6-6}$ , =36. Extremities pentadactylous, the thumb of the anterior hands in the same direction as the fingers, and not opposable; all the fingers furnished with claws instead of flat nails.

I. *Jacchus.* Geoffroy, *Facial angle of 50°; head round; muzzle short; occiput prominent; tail very long, covered with short hairs; upper intermediate cutting teeth larger than the lateral ones; the lower cutting teeth long, narrow; upper canine conical, lower very small; grinders acutely tubercular.*

108. 1. *S. J. Vulgaris* (the Stunted Monkey or *Jacchus*)  
Fur ash-colour; the buttocks and tail annulated with gray, brown and ash; with a white spot on the forehead; and a tuft of very long ash-coloured hairs before and behind the ears; head, and upper part of the neck and shoulders reddish brown.

*Simia Jacchus.* *Lin. Sys. Nat.* 40. *Jacchus vulgaris* *Geoff. Ann. Mus.* XIX. 119. *Hapales Jacchus,* *Illiger Prod.* 72.

*Ouistiti.* *Buff.* xv. 96. *Sagoïn. Clus. exot.* 372. *Sanglin,* or *Cagui minor,* *Edw. Glean. Striated Monkey. Pennant Quad.* 224.

Icon. *Buff.* xv. t. 14. *Ern. Méth.* t. 18. f. 4. *Audeb. Hist. Fan.* 6. §. 2. t. 4. *Schreb.* t. 33. *Fred. Cuvier Mam.—Edw. Glean,* t. 218. *Shaw. Zool.* 1. t. 25. *Griff. Quad.* t. 19.

Inhabits Guyana and Brazil.

SPECIES OF MAMMALIA.

Variety b. Fur red; buttocks annulated red and gray.

109. 2. *S. J. penicillatus* [the tufted jacchus]. Fur ash-coloured; buttocks and tail annulated brown and ash-colour, forehead with a white spot; and a tuft of black very long hairs before the ears; head and upper part of the neck black.

*Jacchus penicillatus*, Geoff. Ann. Mus. XIX. 119.

Icon. —

Inhabits Brazil.

110. 3. *S. J. leucocephalus* (the white-headed Jacchus). Fur red; head and chest white; upper part of the neck black; tail annulated brown and ash-colour; and a tuft of very long black hairs before and behind the ears.

*Jacchus leucocephalus*, Geoff. Ann. Mus. XIX. 1. 20.

*Simia Geoffroyi* Humb. Zool.

Icon. —

Inhabits Brazil.

111. 4. *S. J. auritus* [the great eared Jacchus]. Fur black varied with brown; tail annulated black and ash-colour; with a white spot on the forehead; and a tuft of very long white hairs covering the inside of the ears.

*Jacchus auritus*, Geoff. Ann. Mus. XIX. 119. *Simia auritus*, Humb. Prod. Zool. Obs.

Icon. —

Inhabits Brazil.

112. 5. *S. J. humeralifer* (the white-shouldered Jacchus). Fur chestnut brown; tail slightly annulated; ash-colour; shoulders, chest and arms white.

*Jacchus humeralifer*, Geoff. Ann. Mus. XIX. 120. *Simia humeralifer*, Humb. Prod. Zool. Obs.

Icon. —

Inhabits Brazil.

SYNOPSIS OF THE

*Obs.* Some Naturalists regard the five last named as mere varieties. All of them have the tail annulated.

113. 6. *S. J. melanurus* (the Black Tailed Jacchus). Fur brown above; yellow beneath; tail of a uniform black. *Jacchus melanurus*, *Geoff. Ann. Mus.* xix. 120.

Icon. —

Inhabits Brazil.

*Obs.* Dr. Kuhl considers this species as the link between the *S. Jacchi*, and *S. midas*, or the *Ouistitis* and the *Tamarins*.

114. 7. *S. J. Argentatus*, (the Mico,) or fair monkey. Fur white; face, hands and feet red; tail black.

*Simia argentata Gmelin*, *Sys. Nat.* 41. *Jacchus argentatus*, *Geoff. Ann. Mus.* xix. 120.

*Mico*, *Buff.* xv. 121. Fair monkey, *Pennant Quad.* 226.

Icon. *Buff.* xv. t. 18. *Ency. Méthod.* t. 19. f. 2. *Audeb. Hist. f.* 6. § 2. f. 2. *Schreb.* t. 36. *Shaw. Zool.* i. 26. *Griff. Quad.* t. 21.

Inhabits Para.

Variety b. Tail white.

II. *Midas*, *Facial angle of 50°*, head round, muzzle short, forehead extended, ears large, occiput prominent; tail very long, covered with short hairs; teeth, pointed; canine teeth, conical, strong; grinders acutely tubercular.

115. 1. *S. M. rufimanus*. (The Tamarin or great-eared monkey). Fur black; buttocks variegated with gray; hands and feet yellowish red.

*Simia Midas*, *Lin. Sys. Nat.* 42. *Midas rufimanus*, *Geoff. Ann. Mus.* xix. 121. *Jacchus rufimanus*, *Desm. Mam.* 94.

*Tamarin*, *Buff.* xv. 92. Little black monkey, *Edwards, Glean.* Great-eared monkey *Pennant*, 223. *Temary*, *Guyaness.*

Icon. *Buff.* xv. t. 13. *Ency. Méthod.* t. 19. f. 3. *Edwards Glean.* t. 196. *Schreb.* t. 37. (from *Edw.*) *Audeb. Hist.*

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6. § 2. f. 5. *Shaw. Zool. t. 26. Griff. Quad. t. 18.*

Inhabits Guyana and Paragua.

116. 2. *S. M. ursulus* (the Negro Tamarin). Fur black; back waved with ~~black~~ red; hands black.

*Simia Midas* Var. *Shaw. Zool. i. 65. Saguinus ursulus Hoff. Natur. x. 101. Midas ursulus, Geoff. Ann. Mus. xix.*

121. *Jacchus ursulus, Desm. Mam. 94.*

Tamarin nègre *Buff. Supp. vii. 116.*

Icon. *Buff. Supp. vii. t. 32. Audeb. Hist. 6. § 2. f. 6. F. Cuvier, Mamm. Lithog.*

Inhabits Para.

Dr. Shaw considered this a variety of the preceding.

117. 3. *S. M. labiatus* (the white lipped Tamarin). Fur blackish, ferrugineous, red below; head black; nose and edges of the lips white.

*Midas labiatus, Geoff. Ann. Mus. xix. 121. Jacchus labiatus, Desm. Mam. 95.*

Icon. —

Inhabits Brazil.

118. 4. *S. M. chrysomelas* (the Yellow fronted Tamarin). Fur black; forehead and upper-side of the tail golden yellow; front arms, knees, chest, and sides of the head chestnut brown.

*Midas chrysomelas, Kuhl. MSS. Jacchus chrysomelas, Desm. Mam. 95.*

Icon. —

Inhabits the large forests of Brazil and Para.

119. 5. *S. albifrons* (the white fronted Tamarin). Fur black, slightly variegated with white; face black; forehead, sides of the neck and throat, covered with very short white hairs; occiput and circumference of the ears garnished with long straight deep black hairs; tail a little

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longer than the body, brown varied with white; round the arms reddish.

*Jacchus albifrons.* *Act. Stockholm.* 1819.

Icon. *Act. Stockholm.* 1819.

Inhabits South America.

*Obs.* the distribution of the colours of this species is very similar to *Midas chrysomelas.*

120. 6. *S. M. rosalia* (the Silky Tamarin). Fur golden red; hair of the head long.

*Simia rosalia,* *Lin. Sys. Nat.* 41. *Midas rosalia.* *Geoff. Ann. Mus.* XIX. 121. *Jacchus Rosalia.* *Desm. Mam.* 95.

*Hapale rosalia.*

*Marikina Buff.* xv. 108. Silky monkey, *Pennant Quad* Lion monkey *Dealers.*

Icon. *Illiger, Prod.* 72.

Icon. *Buff.* xv. t. 16. *Ency. Méth.* t. 19. t. 1. *Schreb.* t. 35. *Audeb. Hist.* 6. § 2. f. 3. *Shaw. Zool.* 1. t. 25. *F. Cuvier, Mamm. t.*—*Griff. Quad.* t. 20.

Inhabits Guyana, and south part of Brazil near Rio Janeiro.

Variety *b.* The fur variegated with black and red.

Var. *c.* The fur and tail fine red.

121. 7. *S. M. leoninus* (the Leonine Tamarin). Fur olivaceous brown; hair of the head long; face black; mouth white; tail black above, brown beneath.

*Simia leoninus,* *Humboldt. Zool. Obs.* 14. *Midas Leoninus,* *Geoff. Ann. Mus.* XIX. 121. *Jacchus leoninus.* *Desm. Mam.* 95.

*Leoncito Humb. l. c.*

Icon. *Humb. l. c. t. 5.*

122. 8. *S. M. Oedipus* (the Pinche). Fur yellow-brown

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above, white below; beard long, silky white; tail bare, reddish, upper part black.

*Sipia Cædipus* Lin. *Sys. Nat.* 41. Midas Cædipus. *Geoff. Ann. Mus.* xix. 121. t. 1. *Josephus cædipus.* *Desm. Mam.* 96.

Pinche, *Buff.* xv. 114. Ilti de Carthagène. *Humboldt, Obs. Zool.* 337. Little lion monkey. *Edw. Glean.* 195.

Red-tailed monkey: *Pennant Quad.* 225.

Icon. *Buff.* xv. t. 17. *Ency. Méthod.* t. 10. f. 5. *Edwards Glean.* t. 195.

*Schreb.* t. 34. (cop. Edw.) *Audeb. Hist. f.* 6. § 2, f. 1 *Shaw. Zool.* 1. t. 25.

Inhabits Carthagena, the mouth of the Rio Sinu, and Guyana.

Genus III.—LEMUR.

FORM approaching that of quadrupeds; cutting teeth  $\frac{1}{4}$  or  $\frac{1}{4}$ ; canine  $\frac{1.1}{1.1}$ ; grinders  $\frac{5.5}{5.5}$  or  $\frac{5.5}{4.4}$ , obtusely tubercular; head long, triangular; nostrils terminal; ears short, hidden; eyes small; tail mostly long; fur woolly.

Eats fruit and roots.

Inhabits Madagascar.

I. LICHANOTUS Illiger. Cutting teeth  $\frac{1}{4}$ ; canine  $\frac{1.1}{1.1}$  grinders  $\frac{5.5}{5.5}$ . Tail very short, or none.

123. 1. *L. Niger*, (the Indri). Fur blackish.

Lemur indri, *Gmelin Sys. Nat.* 42. Indris brevicaudatus, *Geoff. Mag. Ency.* vii. 20, Lichanotus Indri Illiger, *Prod.* 72.

Indri, *Sonnini Voy.* 142. Indri Macauco, *Penn. Quad.* i. 228.

Icon. *Sonn. Voyage*, t. 8. *Audeb. Hist.—Ency. Méthod. Supp.* t. 2. f. 5. *Shaw. Zool.* t. 32.

Inhabits Madagascar.

II. INDRIS, Lacépède. Cutting teeth  $\frac{1}{4}$ ; grinders  $\frac{5.5}{5.5}$ ; tail very long.

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125. 1. *L. I. Laniger* (Flocky lemur). Fur yellow.  
Lemur Laniger, *Gmel. Sys. Nat.* i. 44. Indris longicaudatus, *Geoff. Ann. Mus.* xix. 138. Lichanotus laniger. *Illiger, Prod.* 72.

Maki à bourré, *Sonn. Voy.* vii. 142. Maki fauve, *Buff. Supp.* vii. Flocky Lemur, *Shaw. Zool.* i. 99.

Icon. *Sonn. Voy.* ii. t. 89. *Buff. Supp.* vii. t. 35. *Shaw. Zool.* i. t. 34.

Inhabits Madagascar.

III. PROSIMIA, Brisson. Cutting teeth  $\frac{4}{6}$ ; lower horizontal; grinders  $\frac{6.6}{6.6}$ ; tail very long.

125. 1. *L. P. Macaco* (Ruffed Lemur). Fur varied with large regular patches of white and black; tail black; hairs of the cheeks very long.

Lemur Macaco, *Lin. Sys. Nat.* 44.

Vari. *Buff.* xiii. 174. Ruffed Lemur, *Pennant. Quad.* i. 231.

Icon. *Pet. Gaz.* t. 27. f. 5. *Buff.* xiii. t. 27. 6. *Ency. Méth.* t. 20. f. 2. *Audeb. Hist.* f. 5. 6. *Schreb.* t. 49.

Inhabits Madagascar.

Variety b. Fur white and gray brown.

126. 2. *L. P. Ruber* (Black and red Lemur). Fur of a fine reddish chestnut; head, hands, belly, and tail black; with a white spot on the neck.

Lemur ruber, *Perron & Lesueur. Geoff. Ann. Mus.* xix. 159.

Maki roux. *Fr. Cuvier. Mam. Lithog.*

Icon. *Fred. Cuv. Mam. Lithog.* t.—*Griff. Quad.* t. 33.

Inhabits Madagascar.

127. 3. *L. P. Catta* (Ring-tailed Lemur). Fur reddish ash-coloured above; ash-coloured on the limbs, and white below; tail annulated, black and white.

Lemur Catta, *Lin. Sys. Nat.* 45.

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Mococo, *Buff.* xiii. 174. Macauco, *Edw. Glean.* Ring-tailed Lemur, *Shaw. Mus. Lever.* 43. Ring-tailed Macauco, *Pennant. Quad.* i. 130.

Icon. *Buff.* xiii. t. 22. *Ency. Méthod.* t. 20. f. 3. *Audeb. Hist. f.* 4. *Edw. Glean.* t. 197. *Schreb.* t. 41. *Shaw. Zool.* i. t. 35. *Mus. Lever.* t. 11. *F. Cuvier. Mam. Lithog.* t.—*Griff. Quad.* t. 31.

Inhabits Madagascar.

128. 4. *L. Niger.* (Black Lemur). Fur black; with long hairs under the neck.

Lemur niger, *Geoff. Ann. Mus.* xix. 159. *L. Macaco.* Var. *Shaw.* 1. 98.

Black Maucauco, *Edw. Glean.* vii. 217.

Icon. *Edw. Glean.* t. 217.

Inhabits Madagascar.

129. 5. *L. P. Mongooz.* (the Mongooz). Fur yellowish-gray above, white below; the circumference of the eyes and forehead black.

Lemur mongoz, *Lin. Sys. Nat.* 44.

Mongous, *Buff.* xiii. 198. Mongooz, *Edw. Glean.* iii. 216. Woolly Macauco, *Pennant. Quad.*

Icon. *Buff.* xiii. t. 26. *Edw. Glean.* iii. t. 216. *Ency. Méth.* t. 20. f. 1. *Schreb.* t.—*Shaw. Zool.* t. 33.

Inhabits Madagascar.

130. 6. *L. P. Fulvus.* (Yellow Lemur). Fur brown above, and gray below; forehead elevated, and prominent.

Lemur fulvus, *Geoff. Ann. Mus.* xix. 161. *L. Mongoz* var. *Shaw.* 96.

Grand Mongous, *Buff. Supp.* vii. 118.

Icon *Buff.* vii. t. 33. *Geoff. Menag.* t.—

Inhabits Madagascar.

131. 7. *L. P. Albimanus* (White-handed Lemur). Fur gray,—brown above; sides of the neck cinnamon-red; chest and hands white; belly reddish.

SYNOPSIS OF THE

*Lemur albimanus*, Geoff. *Ann. Mus.* xix. 160.

Maki aux pieds blancs, *Briss. Reg. Anim.* 221 Mongous, *Audeb. Hist.*

Icon. *Audeb. Hist. f.* 1

Inhabits Madagascar

132. 8. *L. P. Rufus* (Red Lemur). Fur golden-red above, yellowish-white beneath; sides of the face and chin white, with a black band extended from the face to the occiput.

*Lemur rufus*, Geoff. *Ann. Mus.* xix. 160.

Maki roux, *Audeb. Hist.*

Icon. *Audeb. Hist. f.* 2.

Inhabits Madagascar.

133. 9. *L. P. Collaris* (Collared Lemur). Fur red-brown above, yellow beneath; mane red; face lead-coloured.

*Lemur collaris*, Geoff. *Ann. Mus.* xix. 161.

Maki d'Anjouan. Mongous. Var. *Fred. Cuvier. Mamm?*

Icon. —

Inhabits Madagascar.

The top of the head gray, and the fur yellower, in the female.

*Obs.* M. F. Cuvier considers this a variety of the Mongous.

134. 10. *L. P. Albifrons* (White-fronted Lemur.) Fur reddish-gray above, whitish beneath; forehead of the male white, of the female deep gray; with a black longitudinal line on the upper part of the head.

*Lemur. albifrons.*

*L. Angouan.* Geoff. *Ann. Mus.* xix. 161.

Makis aux pieds fauves. *Brisson. Règ. Anim.* i. 221 ?

Icon. *Audeb. Hist. f.* 3. *F. Cuvier. Mam. t.* —

Inhabits Madagascar.

135. 11. *L. P. Nigrifrons* (Black-fronted Lemur.) Fur above ash-coloured before, and reddish-gray behind; with a

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black band on the forehead; belly and under part of the thighs red.

*Lemur nigrifrons*. *Geoff. Ann. Mus.* xix. 160.

Maki v. 1. *Brisson. Regn. Anim.* 220.

Icon. *Petiver.—Schreb. t.* 42.

Inhabits Madagascar.

136. 12. *L. P. Cinereus* (Ashy Lemur.) Fur above yellowish-gray, beneath dirty white.

*Lemur-cinereus*, *Geoff. Mag. Encycl.*

Petit maki, *Buff. Supp.* vii. Grisset, *Audeb. Hist.*

Icon. *Buff. Supp.* vii. t. 84. *Audeb. Hist. f.* 7.

Inhabits Madagascar.

V. STENOPS, Illiger. *Cutting teeth*  $\frac{3}{4}$ ; *lower horizontal*; *canine*  $\frac{1.1}{1.1}$ ; *grinders*  $\frac{6.6}{5.5}$ ; *limbs thin*; *tail none*.

137. 1. *L. S. Gracilis* (The Slender Loris.) Fur reddish, with a white spot on the forehead.

*Lemur Loris*, *Shaw Zool.* i. 93. *Loris gracilis*, *Geoff. Ann. Mus.* xix. 161. *Loris ceylonicus*, *Fischer. Anat.* 28.

*Loris*, *Buff.* xiii. *Loris Macauco*, *Pennant Quad.* 228.

Icon. *Seba Mus.* i. t. 35. *Buff.* xiii. t. 30. *Audeb. Hist. t.* 2. *Ency. Méthod. t.* 19. f. 4. *Shaw. Zool. t.* 31. *Fischer. Anat. Makis. t.* 7, 8, 9, and 18.

Inhabits the island of Ceylon.

IV. NYCTICEBUS, Geoffroy, *cutting teeth*  $\frac{3 \text{ or } 4}{4}$ ; *canine*  $\frac{1.1}{1.1}$ ; *grinders*  $\frac{6.6}{5.5}$ ; *tail more or less long*; *extremities shortish*—*Nocturnal*.

138. 1. *L. N. Bengalensis* (The Slow Lemur.) Fur red; dorsal line brown; muzzle large; cutting teeth  $\frac{3}{4}$ ; tail very short.

*Lemur tardigradus*, *Lin. Sys. Nat.* 44. *Loris paresseux*, *Cuv. Reg. Anim. t.* 118. *Nycticebus Bengalensis*, *Geoff. Ann. Mus.* xix. 164. *Stenops Bengalensis*, *Illiger, prod.* 73.

*Paresseux pentadactyle du Bengal*, *Vosmaër. Loris du*

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Bengale, *Buff. Supp.* VII. 125. Slow Lemur, *Shaw. Zool.* I. 81. Slow-paced Lemur, *Shaw. Spec. Lin.*

Icon. *Vosmar. t. 6. Buff. Sup.* VII. t. 36. *Ency. Méth. Sup.* t. 2. f. 6. *Audeb. Hist. t. 1.* *Shaw. Spec. Lin. t. 5;* *Zool.* 1. t. 29. *Griff. Quad. t. 34.*

Inhabits Bengal.

139. 2. *L. N. Javanicus* (Javanese Loris.) Fur red; dorsal line deeper; muzzle narrow; cutting teeth  $\frac{3}{4}$ ; tail short. *Nycticebus Javanicus*, *Geoff. Ann. Mus.* XIX. 164.

Icon. —

Inhabits Java.

140. 3. *L. N. Ceylonicus* (Ceylon Loris.) Fur brownish-black; back quite black; cutting teeth —

*Nycticebus Ceylonicus*, *Geoff. Ann. Mus.* XIX. 1. 64.

*Cercopithecus Zeylonicus*, *Seba. Mus.* I. 75.

Icon. *Seba. l. c. t. 47. f. 1.*

Inhabits Ceylon.

*Obs.* These two species are only known by Geoffroy's description.

V. GALAGO, Geoffroy. cutting teeth  $\frac{2\frac{1}{2}}{6}$ ; lower horizontal; canine  $\frac{1.1}{1.1}$ ; grinders  $\frac{2.6}{5.5}$ ; ears very large; hinder legs long; tail very long.

141. 1. *L. G. Madagascariensis* (Little Galago.) Fur red; ears half as long as the head; tail much longer than the body, covered with short hairs; cutting teeth  $\frac{3}{4}$ .

*Lemur murinus*, *Cimelia Physica.* 25. *Lemur pusillus*, *Audeb. Hist.* Galago Madagascariensis, *Geoff. Ann. Mus.* XIX. 166.

Little Lemur, *Brown Illus. Zool.* 108? Rat de Madagascar, *Buff. Suppl.* VII. 149. Murine Maucauco and Little Maucauco, *Pennant Quad.* I. 232.

Icon. *Buff. Supp.* VII. t. 20. *Audeb. Hist. t. — Brown. Illus. Zool. t. 44.* *Miller, Cim. Phys. t. 13.*

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Inhabits Madagascar.

142. 2. *L. G. crassicaudatus* (Great Galago.) Fur red gray ; ears two-thirds of the length of the head ; tail very tufted ; cutting teeth 4.

*Galago crassicaudatus*, *Geoff. Ann. Mus.* xix. 166. *Ortho-licnus Galago*, *Illiger, prod.* 74.

Le Grand galago, *Cuv. Reg. Anim.* 1.

Icon. *Cuvier, R. Ann.* iv. t. 1. f. 1. *Desm. Nov. Dict. Hist. Nat.* xiii. t. E. 31.

Inhabits —

143. 3. *L. G. Guiniensis* (Potto.) Fur red, ash-coloured when very young ; tail half the length of the body.

Lemur Potto, *Gmelin. Sys. Nat.* 42. *Nycticebus potto*, *Geoff. Ann. Mus.* xix. 165. *Galago guinensis*, *Desm. Mam.* 104.

Potto, *Bosman Guin.* ii. 30.

Icon. *Bosman. l. c. t.* 4.

Inhabits Guinea.

*Obs.* Like *N. Bengalensis*, but it has a tail in Bosman's figure, which is the only one of the animal.

144. 4. *L. G. Demidoffi*, (Demidoff's Galago). Fur red brown ; ears shorter than the head, tail longer than the body ; reddish, end tufted ; cutting teeth 3.

Lemur minutus, *Cuv. Tab. element* 101. *Galago Demidoffi*, *Fischer, Act. Moscou*, i. 24. *Geoff. Ann. Mus.* xix. 166.

Icon. —

Inhabits Senegal? Size of the common rat ; muzzle blackish.

145. 5. *L. G. Senegalensis*, (Senegal Galago). Fur red gray, beneath white, ears longer than the head ; tail longer than the body, red, end tufted ; cutting teeth 4.

Lemur Galago, *Schreb. Lemur Galago, Shaw, Zool.* 1. 108. *Galago Geoffroyii Fischer. Act. Moscou*, i. 25. *G. Senegalensis. Geoff. Mém. sur Makis.* 20.

## SYNOPSIS OF THE

Galago. *Adanson Senegal*. Whitish Lemur, *Shaw. l. c.*  
Icon. *Geoff. Mem. sur Makis, t. 1. Ency. Meth. Suppl. t*  
*2. f. 7. Schreb. t.—*  
Inhabits Senegal.

VI. CHEIROGALEUS, *Geoffroy*. Teeth—? ears short, oval;  
whiskers large; tail long, tufted, cylindrical, reconvolute;  
hair short.

146. † 1. *L. C. Major* (Large Cheirogaleus). Fur deep  
brown, particularly between the eyes; length eleven inches.

147. † 2. *L. C. Medius* (Middle Cheirogaleus.) Fur  
lighter; eyes surrounded with black rings, length eight  
inches.

148. † 3. *L. C. Minor* (Small Cheirogaleus.) Very like  
the former, but pale, and only seven inches long.

This sub-genus, containing three species, was established  
by Geoffroy, from drawings of Commerson. Geoffroy sug-  
gests that Pennant knew the last, and confounded it with  
his *Madagascar Rat, Galago Madagascariensis*.

VII. TARSIVS. (Storr). Cutting teeth  $\frac{4}{4}$ , unequal, canine  $\frac{1-1}{1-1}$ ,  
small; grinders  $\frac{6-6}{6-6}$ ; ears large, naked; hinder legs very long;  
tarsi long, tail long.

149. 1. *L. T. Spectrum*. Fur reddish, ears half as long  
as the head.

*Didelphis Macrotarsus*. *Gmel. Sys. Nat.* 109. Lemur  
*Spectrum, Pallas Gires*, 274. Lemur Tarsier, *Shaw,*  
*Zool.* i. 105. *Tarsius Daubentonii. & T. Pallassii. Geoff.*  
*Mag. Ency.* *T. Spectrum, Geoff. Ann. Mus.* xix. 168.  
*T. Macrotarsus, Illiger. prod.* 74.

Tarsier, *Buff.* xiii. 87. Tarsier Maucauco. *Penn. Quad.*  
i. 231. Woolly Gerboa, *Penn. Quad.* 298.

Icon. *Buff.* xiii. t. 9. *Audeb. Hist. Makis, t. 1. Ency.*  
*Method. t. 22. f. 5. Shaw, Zool.* 1. t. 35.

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Inhabits Amboyna and East India Islands.

150. 2. *L. T. Fuscomanus* (Yellow-handed Tarsier.) Fur clear brown, beneath grayish white; ears twice as long as the head.

*Tarsius Fischerii* Desm. *Dict. Hist. Nat. ed. 1.*—Tarsier *Fuscomanus*. *Fisch. Anat. Maki. Geoff. Ann. Mus. xix.* 198.

Icon. *Fischer. l. c. t. 3. 4. Ency. Méthod. Suppl. t. 2. f. 8.*

Inhabits Madagascar.

151. 3. *L. T. Bankanus*. Fur brown, ears, rounded, horizontal, much shorter than the head; tail very thin, cutting teeth  $\frac{2}{3}$ .

Tarsier. *Bancanus*. *Horsfield, Java. fasc. 2.*

Icon. *Horsfield, Java, t.* Teeth and skull.

Inhabits Borneo, one of the East Indian Islands.

*Obs.* According to some Naturalists these species are said all to be only varieties of ages.

VIII. CHEIROMYS, Cuvier. *Cutting teeth*  $\frac{2}{3}$ , strong; *canine*  $\frac{0.0}{0.0}$ , leaving a space; *grinders*  $\frac{4.4}{3.3}$ ; *fore legs short, with the middle finger very long and thin; hind leg long; tail long, tufted; teats two, inguinal.*

152. 1. *L. C. Madagascariensis* (Aye, Aye). Fur brown, coarse; tail black.

*Lemur psylodactylus*. *Schreb. Suppl.*—*Shaw, Zool. 1.* 109.

*Sciurus Madagascarensis*, *Gmelin. Sys. Nat.* *Cheiromys*

*Madagascariensis*, *Geoff. Ann. Mus. Daubentonii. Geoff.*

*Mem. Decad. Phil. et Litt. v.* 28.

Aye Aye. *Sonnerat Voy. aux Ind. 11.* 142. Aye Aye

Squirrel, *Pennant, 11.* 142. Long-fingered Lemur, *Shaw,*

*Zool. 1.* 109.

Icon. *Sonnerat Voy. 61.* 88. *Buff. Suppl. 71.* 68. *Geof.*

*Mem. t.*—*Schreb. t.*—*Shaw, Zool. 1. t. 34.*—*Skul. Cuvier.*

*Reg. Animal, t. 3.*

Inhabits Madagascar.



## SPECIES OF MAMMALIA.

### ORDER III.—CARNASSIERS.

**TEETH** of three sorts, incisives, canines, and cheek teeth, more or less of a trenchant or carnivorous character. Articulation of the lower jaw crosswise, so as to prevent any other than a vertical motion. Orbits not separated from the temporal fossæ. Zygomatic arch wide and elevated. Thumb of the anterior extremities never opposable to the other fingers or toes. Stomach simple, membranaceous. Intestines short.

*Eats* more or less of animal and vegetable matter in the different species, but never grass or leaves.

*Habits* various. More or less savage, as their physical traits are more or less of a carnivorous character.

*Inhabits* nearly all the habitable parts of the globe.

This order is divided into four families, viz.

- |                 |  |                |
|-----------------|--|----------------|
| 1. CHEIROPTERA. |  | 3. CARNIVORA.  |
| 2. INSECTIVORA. |  | 4. MARSUPIATA. |

#### Family I.—CHEIROPTERA.

Fingers of the anterior extremities connected by a membrane, which spreads from the anterior to the posterior extremities, and in many of the species also connects the latter to each other, forming altogether an apparatus more or less effective for flight. Incisives various in number. Canines more or less strong. Cheek teeth, in general, having their crowns furnished with several acute points; but in the first group of the first genus a single regular furrow or indentation passes along the whole series, both sides of each tooth approaching the figure of the transverse section of a cone, a little convex, notched on the upper edge from right to left. Mammæ, in general, two, pectoral.

## SYNOPSIS OF THE

### Genus I.—VESPERTILIONIDÆ\*, BATS, generally.

Anterior fingers excessively elongated, and the membrane between them spread over a large surface, thereby enabling the animal to keep up a continued and rapid flight.

\* \* With frugivorous cheek teeth.

Sub-genus I. PTEROPUS. Brisson. *Incisive teeth*  $\frac{1}{2}$ , conical in shape; *canine*  $\frac{1}{1}$ ; *cheek-teeth*  $\frac{2}{2}$ , presenting a surface neither flat nor aculeate, each tooth having two roof-shaped ridges, forming a longitudinal furrow between them, extending along the whole series. No membranaceous appendage to the nose. Tail short, or wanting. Interfemoral membrane sloped off. The index finger has a third phalanx and a nail. Tongue papillary. Habits nocturnal, gregarious. Regimen frugivorous.

#### § 1. Without a tail.

153. 1. *P. Edulis*, (the great Black Pteropus, or Eatable Bat.) Black, with the upper part of the neck ochreous red; back covered with black and white hairs intermixed; length of body one foot, expanse of wings five feet.

*Pteropus Edulis*, Peron and Lesueur. *Geoff. Ann. du Mus d'Hist. Nat. t. xv. p. 90.* *Pteropus Javanicus*, Desmarest. *Ency. Méthodique, sp. 136,* and *Horsfield's Zoological Researches, No. iv.*

Kalong of the *Javanese*. Malanon Bourou of the *Malays*. Icon. *Horsfield's Zool. Researches, No. iv.*

Inhabits Java.

Var. a. With a collar of lighter brown round the neck, and a general mixture of brown hairs with the black.

*Obs.* The external characters of this species are considerably subject to vary, and it seems probable that it exists

\* The Greek termination is here employed to distinguish the whole genus of Bats collectively from the sub-genus, *Vespertilio*.

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in various parts of India, more or less diversified in its colour.

154. 2. *P. Edwardsii* (Rousette of Edwards.) Red; back chestnut brown.

*Vespertilio Vampyrus*, *Linn.* Great Bat of Madagascar, *Edwards.*

Icon. *Edwards's Birds*, f. 180.

Inhabits Madagascar.

155. 3. *P. Vulgaris* (Common Rousette.) Under parts black, except about the pubis where the colour is red; back inclining to red; covered, particularly on the under parts, with very thick hair. Length of body about ten inches. Expanse of wings three feet and upwards.

*Vespertilio Ingens*, *Clus. Exotic. Tab. p. 94.* *V. Vampyrus*, *Linn.* *Pteropus Vulgaris*, *Geoff. Ann. du Mus. t. xv.* Chien Volant, *Daubenton, Mém. de l'Acad. Roy. des Sciences*, 1759. *Rousette Brisson, Règne Anim. 216.*

Icon. *Buff. t. x. pl. 14.*

Inhabits the Isle of France and Bourbon.

Var. a. *Ann. Mus. t. vii. p. 227.* Brightish red and yellow.

156. 4. *P. Rubicollis* (the Red-collared Rousette.) Gray-brown; red round the neck. Ears short. Length of body about eight inches; expanse of wings about two feet.

*Pteropus Fuscus*, *Brisson, Règne Anim. p. 217.* *Pteropus Rubicollis*, *Geoff. Ann. Mus. xv. p. 93.*

*Roulette*, *Buffon, t. x.*

Icon. *Buffon, t. x. pl. 17.*

Inhabits the Isle of France.

157. 5. *P. Griseus* (the Gray Rousette.) Head and neck

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bright red, the rest reddish gray. Length of body seven inches; expanse of wings one foot eight inches.

*Pteropus Griseus*, *Geoff. Ann. Mus.* xv. p. 94.

Icon. *Geoffroy, Ann. Mus.* xv. pl. 6.

Inhabits the Island of Timor.

158. 6. *P. Leschenaultii* (the Spotted Rousette.) Ashy yellow above, varied with white beneath; the membrane near the body spotted white, ranged on a parallel line, with similar spots between the neck and the arms.

*Pteropus Leschenaultii*, *Desmarest, Ency. Méthod. Mammalogie*, sp. 142.

Icon. —

Inhabits the environs of Pondicherry.

159. 7. *P. Rostratus* (the Lowo Assu, or Dog Bat of Java.) Body of an uniform grayish Isabella colour, deeper on the top of the head; muzzle elongated. Length of body three inches and a half; expanse of wings about eleven inches.

*Pteropus Rostratus*, *Horsfield, Zoological Researches*, No. III. *Macroglossus*, *F. Cuvier, Dents des Mammifères*, p. 40?

Icon. *Ib.*

Inhabits Java.

*Obs.* M. F. Cuvier (*Dents des Mammifères*) says, that the *Pteropus Rostratus* of Horsfield, which he identifies with *Pteropus minimus* of Geoffroy, has the cheek teeth  $\frac{4}{4}$ , and he therefore makes a distinct genus of it, under the name of *Macroglossus*. We cannot but conclude that Dr. Horsfield has correctly stated the teeth of his *Rostratus*, and therefore that the *Macroglossus* of M. F. Cuvier, from a head brought to France by M. Duvaucel, is distinct from the former.

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§ II. With a tail.

160. 8. *P. Stramineus* (Lesser Ternate Bat.) Reddish yellow ; neck red ; tail very short ; length of body upwards of five inches ; expanse of wings two feet.

*Pteropus Stramineus*, *Geoff. Ann. Mus.* xv. p. 95.

Lesser Ternate Bat, *Pennant, Synop.* Chien Volant, *Seba, Thes.* 1.

Icon. *Pennant, Synop. tab.* 31, *f.* 1. *Seba, Thes. tab.* 57, *f.* 1 and 2.

Inhabits Timor.

Var. a. With the fur of the back erect. Inhabits Ternate.

161. 9. *P. Ægyptiacus* (Egyptian Rousette.) Head shorter and larger than the others of this division. Fur gray-brown, deepest on the back, of a soft silky texture. Body rather larger than the last, but expanse of wings one foot eight inches.

*Pteropus Ægyptiacus*, *Geoff. Mém. de l'Institut. d'Égypte*, and *Ann. Mus. tom.* xv. p. 96.

Icon.

Inhabits Egypt.

*Obs.* This species is found suspended to the ancient buildings of Egypt, in the manner of the Common Bat.

162. 10. *P. Amplexicaudatus* (Long-tailed Rousette.) Reddish gray. Tail longer than others of this division, extending half beyond the interfemoral membrane. Length of body between four and five inches. Expanse of wings about one foot six inches.

Rousette Amplexicaude, *Geoff. Ann. du Mus. t.* xv.

Icon. *Geoffroy, Ann. Mus. pl.* 4.

Inhabits Timor.

163. 11. *P. Marginatus* (the Bordered Rousette.) Olive

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brown, with a white border round the ears. Body about three inches long ; expanse of wings about a foot.

*Cynopterus Marginatus*, F. Cuvier, *Dents des Mammifères*, p. 39.

Rousette à oreilles bordées, *Geoff. Ann. du Mus. t. xxv. p. 97.*

Icon. *Ibid. pl. 5.*

Inhabits Bengal.

*Obs.* M. F. Cuvier (*Dents des Mammifères*) edits a new genus under the name *Cynoptères*, from a head imported by M. Duvaucel, with the cheek teeth  $\frac{4}{3}$ . M. Cuvier identifies this with *P. Marginatus*, which M. Geoffroy had treated, from the number and character of the teeth to be a *Pteropus*.

164. 12. *P. Minimus* (the Kiodote.) Fur bright red, and woolly. Tongue extensible, two inches in length, thick, and covered with horny papillæ, and the point turned backwards. About the size of *P. Marginatus*.

*Pteropus*, *Desmarest, Ency. Method. Mammalogie, sp. 147.*  
Rousette Kiodote, *Geoffroy, Ann. du Mus. tom. xv. p. 97.*

Icon. —

Inhabits Java.

*Obs.* We have already noticed that this is identified by M. F. Cuvier with *P. Rostratus*, and is treated by him as generically distinct.

165. 13. *P. Palliatus* (the Mantled Rousette.) Covered with silky straw-coloured hair. The membrane of the wings attached to the dorsal line, and having the appearance of a mantle. Length of body about four inches ; expanse of wings one foot fourteen inches. Length of tail seven inches.

*Pteropus palliatus*, *Geoff. Ann. du Mus. xv. p. 99*

Icon. —

Inhabits India.

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*Obs.* This species, says Desmarest, when better known, will probably form a new genus, intermediate between Pteropus and Cephalotes.

II. CEPHALOTES. Geoffroy. Dentition as stated by M. Geoffroy: *Incisive teeth*  $\frac{3}{3}$ , in the upper jaw perfectly insulated and distant from each other, in the lower almost close; *canine*  $\frac{1}{1}$ ; *cheek teeth*  $\frac{4}{4}$ , in general worn down, the posterior with large upper surface, without tubercles or ridges. According to M. F. Cuvier, the teeth are: *Incisors*  $\frac{3}{3}$ ; *canines*  $\frac{1}{1}$ ; *cheek teeth*  $\frac{4}{4}$ . No membranaceous appendage to the nose. *Index finger* of one known species with a nail, of the other without. *Tail* very short. *Interfemoral membrane* sloped off; *membrane of the wings* attached to the dorsal line.

166. 1. *C. Peronii* (Peron's Cephalote.) Fur in some brown, in others red. Wanting a nail on the index finger. Body six inches long; expanse of wings about two feet two inches. Tail nearly an inch long.

*Cephalotes Peronii*, Geoff. *Ann. du Mus. t. xv. p.*

Icon. *Geoffroy, Ann. Mus. xv.*

Inhabits the Isle of Timor.

167. 2. *C. Pallasii* (Pallas's Cephalote.) Fur cinereous gray above, pale white beneath, and undulated on the belly. Nostrils prolonged into a tube, very distant and open. The index finger provided with a nail. Body about four inches long; wings one foot four inches wide. Tail less than an inch long.

*Cephalotes Pallasii*, Geoff. *Ann. du Mus. t. xv. Vesper-tilio Cephalotes*, Pallas, *Spic. Zool. fasc. III. Harpyia*, Illiger, *Prodromus Anim. Cephalote*, Buffon, *Supp. tom. III.*

Icon. *Pallas, l. c. tab. 1 and 2. Buffon, do. tab. 52.*

Inhabits the Moluccas.

*Obs.* Pallas states that his individual had but two upper

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incisors and none in the lower jaw, whence Illiger has treated it as a genus, under the name *Harpysia*. Geoffroy inclines to the opinion that the individual in question had them originally, but that they were lost.

\* \* \* Bats, properly speaking, with insectivorous cheek teeth.

† Middle finger with three bony articulations, the other fingers with two.

III. **MOLOSSUS**. Geoffroy. *Incisive teeth*  $\frac{3}{2}$ , *in the upper jaw bifid, converging, and separated from the canine teeth; in the lower very small, and crowded together, each having two small points; canine*  $\frac{1}{1}$ ; *cheek teeth*  $\frac{4}{2}$ , *large, furnished with several sharp points. Head and muzzle very large. Nostrils open. Ears large, united at their base, and provided with a smaller secondary tragus. No membranaceous appendage to the nose. Interfemoral membrane narrow, and cut rectangular. Tail long.*

168. 1. *M. Longicaudatus* (Bulldog Bat.) Fur ashy yellow. A sort of band or rising of the skin passes from the end of the muzzle to the forehead. Length of body under two inches. Tail nearly as long.

*Molossus Longicaudatus*, Geoff. *Ann. du Mus. tom. vi. p. 155.* *Vespertilio Molossus*, Gm.

Mulot Volant, *Daub. Buffon, tom. x. Bulldog Bat, Pen. Quad. 11. p. 13.*

Icon. *Buffon, t. x. tab. 19, f. 2. Schreber, tab. 59.*

Inhabits Martinique.

*Obs.* Desmarest is of opinion that Geoffroy is wrong in identifying this *M. Longicaudatus* with the Mulot Volant of Daubenton.

169. 2. *M. Rufus* (the Red Molossus.) Fur deep red colour above, lighter underneath; muzzle very thick and

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short. Length of body above three inches; expanse of wings eighteen. Length of tail under two.

*Molossus Rufus*, *Geoff. Ann. du Mus. tom. vi. p. 155.*

Icon. —

Habitat unknown.

170. 3. *M. Ater* (the Black Molossus.) Black, with a silvery tinge on the back. Rather less than *M. Rufus*.

*Molossus Ater*, *Geoff. Ann. du Mus. tom. vi. 155.*

Icon. —

Habitat unknown.

171. 4. *M. Obscurus* (the Brown Black Bat of d'Azara.) Blackish brown above, dark beneath; each hair white at its root. Length of body between three and four inches; expanse of wings about a foot. Tail an inch and a half long.

*Molossus Obscurus*, *Geoff. Ann. du Mus. tom. vi. 155.*

The dark Bat or Ninth Bat of d'Azara, *Quad. du Paraguay, tom. II. 288.*

Icon. —

Inhabits Paraguay.

*Obs.* Desmarest doubts the identity of the species of Geoffroy with that of d'Azara.

172. 5. *M. Fusciventer* (the Brown Belly Bat.) Cinereous brown above, cinereous beneath, except the belly, which is brown in the middle of it. Body about two inches long.

*Vespertilio molossus, var. β, Gm. Molossus Fusciventer, Geoff. Ann. Mus. vi. 155.* Second Mulot Volant of *Daubenton's Buffon, t. x.*

Icon. *Buff. t. x. 19.*

Habitat unknown.

*Obs.* Very similar to *M. Longicaudatus*, but distinguished by the brown mark on the belly.

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173. 6. *M. Castaneus* (Chesnut-coloured Molossus Bat.)  
Chesnut above, whitish beneath; a band from the nose to the forehead as in *M. Longicaudatus*. Length of body about five inches; expanse of wings about one foot one inch. Tail two inches.

*Molossus Castaneus*, *Geoff. Ann. Mus. tom. vi. 155.*  
Chesnut Bat, or Sixth Bat of *d'Azara, Quad. du Paraguay, tom. II. 282.*

Icon. —

Inhabits Paraguay.

174. 7. *M. Laticaudatus* (Broad-tailed Molossus Bat.)  
Dark brown above, lighter beneath; the tail surrounded by an extension of the interfemoral membrane; upper lip marked with vertical ridges; tongue appearing double; ears joined at their base. About the size of *M. Castaneus*.

*Molossus Laticaudatus*, *Geoff. Ann. Mus. tom. vi. 156.*  
Dark Bat, or Eighth Bat of *d'Azara, Quad. du Paraguay.*

Icon. —

Inhabits Paraguay.

175. 8. *M. Crassicaudatus* (Great-tailed Molossus Bat.)  
Cinamon colour, lighter beneath; interfemoral membrane enveloping half the tail. Body between three and four inches long: expanse of wings eleven inches. Length of tail above an inch.

*Molossus Crassicaudatus*, *Geoff. Ann. du Mus. tom. vi. 156.*  
Cinnamon Bat, or tenth Bat of *d'Azara, Quad. du Paraguay.*

Icon. —

Inhabits Paraguay.

176. 9. *M. Amplexicaudatus* (Guyane Molossus Bat.)  
Blackish, but lighter underneath; interfemoral membrane larger than in the preceding species, and entirely embracing the tail.

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*Molossus Amplexicaudatus*, *Geoff. Ann. Mus. tom. vi.*

156. *Buffon, Sup. tom. vii. 294.*

Icon. *Buffon, Sup. vii. pl. 75.*

Inhabits Cayenne.

177. 10. *M. Acuticaudatus* (Sharp-tailed *Molossus*.)

Black-brown; interfemoral membrane large, enveloping the tail except just the end. Length of body under two inches. Tail about the same length.

*Molossus Acuticaudatus*, *Desmarest, Ency. Method. Art. Mammalogie, sp. 160.*

Icon. —

Inhabits Brazil.

178. 11. *M. Ursinus* (Ursine Bulldog Bat.) Black body, and jaws robust. Ears falling over the forehead.

*Molossus ursinus*, *Spix, Sim. Braz. 59.*

Icon. *Spix, Sim. Braz. t. 35. f. 4.*

Inhabits Para, Brazil.

179. 12. *M. Nasutus* (Proboscis Bulldog Bat.) Nose lengthened. Ears distant over the forehead. Body above brown-black, below brown. Tail nearly half free beyond the membrane.

*Molossus Nasutus*, *Spix, Sim. Braz. 59.*

Icon. *Spix, Sim. Braz. t. 35, f. 7.*

Inhabits sides of the river St. Francis, Brazil.

Probably a new subgenus.

180. 13. *M. Fumarius* (Smoky Bulldog Bat.) Body blackish brown; face, ears, and wings very black.

*Molossus Fumarius*, *Spix, Sim. Braz. 59.*

Icon. *Spix, Sim. Braz. t. 35, f. 5, 6.*

Inhabits Brazil.

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IV. NYCTINOMUS. Geoffroy. *Incisive teeth*  $\frac{3}{2}$ , conical and contiguous in the upper jaw, small in the lower; canine  $\frac{1}{1}$ ; cheek teeth  $\frac{4}{2}$ , furnished with sharp tubercles = 28. Nose flat, and on a level with the lips, which are deeply cleft or wrinkled. Ears large, and united with exterior tragus. Tail long, extending in part beyond the interfemoral membrane. No appendage to the nose. Wings very large. Hind feet covered with long hair.

181. 1. *N. Ægyptiacus* (Egyptian Nyctinome.) Red above, brown beneath; upper lips much wrinkled. Interfemoral membrane enveloping half the tail, and destitute of muscular bands. Length of body about three inches.

Nyctinome d'Égypte, Geoff. *Mem. de l'Institut de l'Égypte, Hist. Nat. tom. 11. 28.*

Icon. Geoff. *Egypt. pl. 2, No. 2.*

Inhabits Egypt.

182. 2. *N. Bengalensis* (Bengal Nyctinome.) Tail thick. Upper lips having several folds. Interfemoral membrane with muscular bands\*. About the size of *N. Ægyptiacus*.

Vespertilio Plicatus, Buchanan, *Voyage to India. Transactions of the Lin. Soc. v. 263.* Nyctinomus Bengalensis, Geoff. *Ægypt. His. Nat. tom. 11. 130.*

Icon. *Lin. Soc. Transactions, vol. v. t. 13.*

Inhabits Bengal.

Obs. Buchanan describes but two incisives in each jaw.

183. 3. *N. Acetabulosus* (Port Louis Nyctinome.) Brown-

\* Mr. Gray observes, from a specimen in spirits in the British Museum, which agrees with Buchanan's description, that the interfemoral membrane is destitute of muscular band, but that it is plaited on each side of the tail, which gives it the appearance represented in Buchanan's plate, which has been mistaken for muscular bands by Geoffroy; consequently that the first describer's name is most characteristic.

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black. Interfemoral membrane enveloping two-thirds of the tail. Smaller than the other two species.

Vespertilio Acetabulosus, *Herman, Obs. Zool. p. 19.*

Nyctinomus Acetabulosus, *Ency. Méthod. Art. Mammalogie, sp. 263.* Nyctinomus Mauritianus, *Geoff. Egypt. Hist. Nat. II. 130.* *Horsfield's Java, No. 5.*

Icon. —

Inhabits the environs of Port Louis, in the Island of Mascareigne.

184. 4. *N. Dilatus* (Dilated Nyctinome Bat.) Blackish brown, paler underneath. Wings dilated. Tail slender, attached half way down to the interfemoral membrane, which is furnished with a few muscular bands.

*Nyctinomus Dilatus, Horsfield's Java, No. 5.*

Icon. —

*Horsfield's Java.*

185. 5. *N. Tenuis* (Lowo-churut of Java.) Blackish brown. Wings of great length, and very narrow. Tail slender, the latter half free beyond the interfemoral membrane; edge of the interfemoral membrane folded, and furnished with muscular fibres.

*Nyctinomus Tenuis, Horsfield, Zool. Researches in Java, No. 5.*

Icon. *Horsfield's Java.*

Inhabits Java.

186. 6. *N. Braziliensis* (Brazilian Nyctinome.) Generally of a cinereous brown colour, lighter on the lower parts by varying also from yellow hair to black hair, in different individuals. Upper lip not so deeply notched as in the Egyptian species. Ears with folds or wrinkles.

*Nyctinomus Braziliensis, Isidore Geoffroy St. Hilaire,*

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*Annales des Sciences Naturelles* for April, 1824, and *Zoological Journal*, No. III. p. 233.

Icon. *Ann. des Sci.* 1824. *Zool. Journal*, No. III. pl. 11.  
Habitat Brazil.

187. 7. *N. ? Murinus* (Murine Nyctinome.) Body blackish above, brown underneath; wings, ears, and head black. Interfemoral membrane destitute of muscular bands. Tail about two-thirds exerted. Length of body two inches and a half; of tail an inch; expanse of wings eight inches.

Nyctinomus *Murinus*, *Gray, MSS.* from a specimen in the British Museum, the teeth of which cannot be examined.

Icon. —

Inhabits Jamaica? according to Redman.

*Obs.* If the habitat is correctly stated, this is the second species found out of the old continent.

V. CHEIROMELES. Horsfield. *Incisive teeth*  $\frac{3}{3}$ ; *canine*  $\frac{11}{11}$ ; *cheek teeth*  $\frac{4}{4}$ . *Face conical. Ears distant and spreading; operculum short, semicordate blunt. Interfemoral membrane short. Tail exerted. Thumb distinct; claw flat, fringed on the edge with a series of bristles.*

188. 1. *C. Torquatus* (Collared Cheiromeles.) Neck covered with longish hairs; back naked and dotted.

*Cheiromeles Torquatus*, *Horsfield, Zool. of Java*, No. VII.

Icon. *Horsfield Java*, No. VII., and dissection of head.

Inhabits Indian Archipelago.

VI. STENODERMA. Geoffroy. *Incisive teeth*  $\frac{4}{4}$ , according to Geoffroy,  $\frac{3}{3}$  according to Cuvier; *Canine*  $\frac{1}{1}$ ; *cheek teeth*  $\frac{4}{4}$  = 28. *Ears moderate, lateral and distinct. Interfemoral membrane merely rudimentary. Nose simple. Tail none.*

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189. 1. *S. Rufa* (the Red Stenoderme.) Bright chestnut colour. Ears small, lateral, and isolated without oreillon. Tail none. Length of body about three inches; expanse of wings under a foot.

Stenoderme roux, *Geoff. Mém. de l'Institut de l'Egypte, Hist. Nat. tom. 11.*

Icon. —

Inhabits.

VII. NOCTILIO. Geoffroy. *Incisive teeth  $\frac{4}{4}$ , the two upper intermediate teeth larger than the others, the lower incisors placed before the canine teeth; canine  $\frac{11}{11}$ , very strong; cheek teeth  $\frac{44}{44}$ =26, furnished with sharp tubercles. Ears small, lateral and insulated. Interfemoral membrane large. Tail extending a little beyond the membrane. Muzzle short, thick, cleft, and furnished with warts or fleshy tubercles. Nose without appendage. Claws of hind feet very large.*

190. 1. *N. Leporinus* (the Peruvian or Hare-lipped Noctilio.) Fur of an uniform reddish yellow; as big as a Rat.

Vespertilio Leporinus, *Gm. 1. 47.* Noctilio Americana, *Linn. S. No. 1. 88.* *Geoff. Noctilio Unicolor, Collect. du Mus. d'Hist. Nat.*

Peruvian Bat, *Pennant. Chauve-Souris de la Vallée d'Ylo, Feuillee Obs. 1. 623.* Reddish Bat of *d'Azara Quad. du Paraguay, tom. 11. 280.*

Icon. *Shaw's Zoology, t. 1. p. 1. pl. 41. Schreb. f. 60.*

Inhabits Brazil, Paraguay, and Peru?

Var.  $\beta$ . With a whitish band down the back. Body above four inches long; expanse of wings eighteen inches. Noctilio Dorsatus, *Geoff. Pteropus Leporinus, Erzleben.*

Var.  $\gamma$ . Back reddish, belly white. Peruvian Bat, var.  $\beta$ , *Pennant. Noctilio à ventre blanc, Geoff. Collect. du Mus. d'Hist. Nat. de Paris.*

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191. 2. *N. Rufus* (Red Bulldog Bat.) Body above and below red; the four legs and ears nearly naked, reddish.

Noctilio Rufus, *Spix, Sim. Braz.* 57.

Icon. *Spix, Sim. Braz. f.* 35, f. 1.

Inhabits Brazil.

192. 3. *N. Albiventer* (White-bellied Bulldog Bat.) Body above fuscous brown, beneath whitish; with a whitish line down the centre of the back.

Noctilio Albiventer, *Spix, Sim. Braz.* 58. Not the Albiventer of Geoffroy.

Icon. *Spix, Sim. Braz. f.* 35, f. 2, 3.

Inhabits the banks of the River St. Francis, Brazils.

VIII. PHYLLOSTOMA. Geoffroy. *Incisive teeth*  $\frac{4}{4}$ , pressed close between the canine teeth, the intermediate being the largest; *canine teeth*  $\frac{1}{1}$ ; *check teeth*  $\frac{3}{3} = 32$ . The nose supporting two membraneous crests, one like a leaf, and the other like a horse-shoe. Ears large, naked, not united. Oreillon internal. Tail and interfemoral membrane varying in the several species. Tongue furnished with sharp horny prickles.

\*.\* Tail distinct, shorter than the extent of the interfemoral membrane.

193. 1. *P. Crenulatum* (Indented Phyllostome Bat.) The foliaceous nasal appendage forming a long triangle with the edges jagged or indented, appended to the horse-shoe membrane; under lip furnished with warts. End of the tail freed from the surrounding membrane. Length of body between two and three inches; expanse of wings about fourteen inches.

Phyllostoma Crenulatum, *Geoff. Ann. Mus. tom.* xv. p. 183.

Icon. *Ann. Mus. xv. pl.* 10.

Habitat unknown.

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194. 2. *P. Elongatum* (the Long-leafed Phyllostome Bat.) Nasal leaf not jagged at the edge, but smooth, larger, and longer than in the other species. Extremity of tail free from the membrane. About the size of the last.

*P. Elongatum*, *Geoff. Ann. du Mus. tom. xv. p. 182.*

Icon. *Ann. Mus. xv. pl. 9.*

Habitat unknown.

195. 3. *P. Hastatum* (Spear-leaf Phyllostome, or Javelin Bat.) Brownish red colour above, yellowish brown on the belly. Nasal leaf like a spear-head, small at the bottom and top, and swelled out in the middle; horse-shoe appendage very large. A range of warts in the form of the letter V on the under lip. Tail short, altogether enclosed in the membrane, which is large. Length of body four inches; expanse of wings about one foot nine inches.

*Vespertilio Hastatus*, *Gmel. i. 47.* *Vespertilio Perspicillatus*, *Schreb. Phyllostoma Hastatum*, *Geoff. Ann. Mus. xv. 177.*

Fer-de-lance, *Buffon, tom. 13.*

Icon. *Schreb. pl. 46, A. Buffon, XIII. pl. 33. Ann. Mus. d'Hist. Nat. tom. xv. pl. 11.*

Inhabits Guyana.

196. 4. *P. Planirostra* (Flat-nosed Phyllostome Bat.) Head thick, depressed above; side of the nose tubercular; front of the nasal leaf free, pendulous; lips crenulated on the edges; chin short, flattish. Length of the body three inches and three-quarters.

*Phyllostoma Planirostra*, *Spix, Sim. Braz. 66.*

Icon. *Spix, Sim. Braz. f. 36, f. 1.*

Inhab. Bahiæ, Brazil.

\* \* Without a tail.

197. 5. *P. Perspicillatum* (Spectacle Bat.) Nasal leaf

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short, sloped near its termination. Two white streaks from the nostrils to the ears; blackish-brown above, clear brown beneath. About the size of the last.

*Vespertilio Perspicillatus*, *Lin. V. Americanus Vulgaris*, *Seba, Thes. .i. Phyllostoma perspicillatum*, *Geoff. Ann. Mus. t. xv. p. 176.*

*Le Grand Fer-de-lance*, *Buff. Sup. t. vii.*

*Icon. Seba, Thes. i. pl. 55. Buffon, Sup. vii. pl. 74.*

*Habitat* Guyana, Paraguay?

*Obs.* The first Bat of d'Azara is probably a variety of this.

198. 6. *P. Lineatum* (Streaked Phyllostome Bat.) Brown, lighter underneath, with one white streak from the occiput to the os coccygis, one from each nostril to the ear, and one also from each corner of the mouth to the ear. Length of body about three inches, expanse of wings fifteen inches.

*Phyllostoma Lineatum*, *Geoff. Ann. Mus. t. xv. 180.*

Second Bat of d'Azara, *Quadrupeds of Paraguay*, II. 271.

*Icon.* —

*Habitat* Paraguay.

*Obs.* M. d'Azara's enumeration of the teeth does not accord precisely with those proper to this sub-division.

199. 7. *P. Rotundum* (Round-leaved Phyllostome Bat.) Reddish-brown, with the nasal leaf circular at its extremity. Size of the last.

*Phyllostoma Rotundum*, *Geoff. Ann. Mus. tom. xv. 181.*

The third Bat of d'Azara, *Quadrupeds of Paraguay*, II. 273.

*Icon.* —

*Inhabits* Paraguay.

*Obs.* This species runs on the ground with more ease than its congeners, and is said, like the *Glossophagi*, to suck blood.

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200. 8. *P. Liliun* (the Lily-leaved Phyllostome Bat.)  
 Reddish-brown, lighter underneath; the nasal appendage  
 large, narrow at the base, and erect, in form of a lily-leaf.  
 About the size of *P. Lineatum*.

*Phyllostoma Liliun*, *Geoff. Ann. Mus. tom. xv.*

Fourth Bat of *d'Azara*, *Quadrupeds of Paraguay*.

Inhabits Paraguay.

201. 9. *P. Spectrum* (Spectre or true Vampire Bat.)  
 Brownish-red colour above; reddish-yellow underneath;  
 nasal membrane long and high; jaws elongated. Length  
 of body about six inches.

*Vespertilio Spectrum*, *Linn. Canis Volans maxima au-  
 rita*, *Seba, Thes. 1. Andira Guaca, seu Vespertilio Cor-  
 nutum*, *Piso. Phyllostoma Spectrum*, *Geoff. Ann. Mus. tom.  
 xv. 174. Vampyrus spectrum*, *Leach, Lin. Trans. xlii. 80.*

Spectre Bat, *Pennant's Quad. ii. 308.*

*Icon. Ann. Mus. tom. xv. pl. 11. Piso Braz. 230. Schreb.  
 f. 45. Seba, Thes. 1. pl. 56. Nouveau Dict. d'Hist. Nat.  
 pl. m. 28. f. 3.*

Inhabits New Spain.

M. Auguste St. Hilaire briefly refers to three other speci-  
 es of this division in the French Museum.

IX. VAMPYRUS\*. *Spix. Incisive teeth 4, conical, the two*

\* *Vampyrus*, it is understood, was long ago appropriated by M. Geoffroy  
 (in a MS. communication to Dr. Leach) as a generic name to *V. Spec-  
 trum* of Linnæus; but Spix, in his splendid work on the animals of Brazil,  
 now publishing, has adopted it for three species there described, the *Cirrho-  
 sus*, *Soricinus*, and *Bidens*. These, it will be observed, differ in the cha-  
 racter of their dentition, as *V. Spectrum*, though differing in the number  
 of the cheek teeth from the *Phyllostomata* in general, has been commonly  
 arranged in that genus. Mr. Gray proposes to treat *V. Spectrum* of  
 Linnæus as generically distinct from *Phyllostoma*, under the name of  
*Vampyrus*, as originally applied to it by Geoffroy, and to divide the three  
 species of Spix's genus *Vampyrus* above mentioned into two genera, the  
 one under the name *Istiophorus*, including *Cirrhosus* and *Soricinus*, and  
 the other under that of *Tonatis* including *Bidens* only.

## SYNOPSIS OF THE

*intermediate in the upper jaw being largest; canine teeth  $\frac{1}{1}$ ; cheek teeth  $\frac{4}{4}$ , the first with one tubercle, and the remainder with three. Mouth rather obtuse; lower jaw verrucose. Tail short, involved in the membrane, except just at the apex.*

202. 1. *V. Cirrhosus* (Bearded Vampyre of Spix.) Head oblong; nasal leaf pendulous; lips and chin bearded. Expanse of wings four inches and a half.

Vampyrus Cirrhosus, *Spix, Sim. Braz.* 64.

Icon. *Spix, Sim. Brazil. f.* 36.

Inhabits Brazil.

203. 2. *V. Soricinus* (Soricine Vampyre of Spix.) Body less robust than the last; mouse-colour on the back, brownish-gray underneath; chin smooth.

Vampyrus Soricinus, *Spix, Brazil.* 65.

Icon. *Spix, Brazil. f.* 36, f. 2, 6.

Inhabits Brazil.

204. 3. *V. Bidens* (Two-toothed Vampyre of Spix.) But two incisors in the lower jaw; blackish-brown above, mouse-coloured underneath.

Vampyrus Bidens, *Spix, Sim. Brazil.* 65.

X. GLOSSOPHAGA. Geoffroy. *Incisive teeth  $\frac{1}{1}$ , ranged regularly; canine,  $\frac{1}{1}$ ; cheek-teeth,  $\frac{3}{3}$ . The tongue very long and extensible, acting as an organ of suction. Nose carrying a small crest, in shape like a lance head. Interfermoral membrane and tail little or none. Sanguisugous by means of the tongue.*

205. 1. *G. Soricina* (Leaf Bat of Pennant.) Ashy-brown above, bright-brown underneath; muzzle long; nose surmounted with a small spear-shaped appendage; no tail; body about two inches long; expanse of wings about ten inches.

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Vespertilio Sorcinus, *Pallas, Spic. Zool. Phyllostoma Sorcinum, Geoff. Ann. Mus. xv. and Glossophaga Sorcina, ejusd. Mém. du Mus. d'Hist. Nat. tom. iv.*

La Feuille, *Vicq. d'Azyr Syst. des Anim. tom. III. Leaf Bat, Penn. Quad. II. p. 309. Jamaica Bat, Edwards.*

Icon. *Pallas, Spic, Zool. fasc. III. pl. 3 and 4. Schreb. tab. 7. Edwards, pl. 201. Geoff. Ann. Mus. tom. xv. pl. 11.*

Inhabits Surinam, Cayenne, &c.

206. 2. *G. Amplexicaudata* (Knobbed-tail Glossophag Bat.) Blackish-brown; interfemoral membrane large; a short tail, terminated with a nodosity.

*Glossophaga Amplexicaudata, Geoff. Mém. du Mus. d'Hist. Nat. tom. iv.*

Icon. *Geoff. Mém. du Mus. iv. f. 18, A.*

Inhabits Brazil, the neighbourhood of Rio de Janeiro, &c.

207. 3. *G. Caudifer* (Tailed Glossophag Bat.) Blackish-brown; interfemoral membrane short, with a tail extending beyond it.

*Glossophaga Caudifer, Geoff. Mém. du Mus. tom. iv.*

Icon. *Geoff. pl. 17.*

Inhabits Brazil.

208. 4. *G. Ecaudata* (Tail-less Glossophag Bat.) Dark-brown; interfemoral membrane short; no tail.

*Glossophaga Ecaudata, Geoff. Ann. du Mus. d'Hist. Nat. tom. iv. 418.*

Icon. *Geoff. Ann. du Mus. pl. 18 B.*

Inhabits as the last.

XI. MORMOOPS. Leach. *Incisive teeth 4, the two intermediate in the upper jaw largest; canines 11; cheek teeth 44. Ears large, close, furnished with auricles. Nasal appendage one, erect, confluent with the ears. Index finger two joints,*

## SYNOPSIS OF THE

*middle finger four, the rest three. Tail enveloped in membrane, except the last joint.*

209. 1. *M. Blainvillii* (Blainville's Mormoops Bat.) Nasal leaf plaited; ears above bilobed; labial processes divided.

Mormoops Blainvillii, *Leach, Lin. Trans.* XIII. 76.

Icon. *Lin. Trans.* XIII. f. 7, from Museum of Mr. Brooks.

Inhabits Jamaica.

XII. MEDATEUS. Leach. *Incisive teeth*  $\frac{4}{4}$ , *the two intermediate in the upper jaw longest; canine*  $\frac{1}{1}$ ; *cheek teeth*  $\frac{4}{3}$ . *Nasal appendages two, one vertical, the other lunate and horizontal. Tail none. Lips furnished with a series of warts.*

210. 1. *M. Lewisii* (Lewis's Medateus Bat.) Blackish; nasal leaf vertical, spear-shaped; ears rounded. Expanse of wings seventeen inches.

Medateus Lewisii, *Leach, Linn. Trans.* XIII. 81.

Icon. —

Inhabits. —

$\frac{1}{1}$  Index finger with one bony articulation, the other fingers with two each.

XIII. MEGADERMA. Geoffroy. *Incisive teeth*  $\frac{4}{4}$ ; *canine teeth*  $\frac{1}{1}$ ; *triangular in the upper jaw, inclining backward in the lower cheek-teeth*  $\frac{4}{3}$  = 26. *Ears very large, and united; interior ears much developed. Three appendages to the nose, one erect, one foliaceous or horizontal, and the third like a horse-shoe. Tail none. Interfemoral membrane square. Third finger of the hand without the first phalanx.*

211. 1. *M. Spasma* (Cordated Bat of Pennant.) Reddish, brighter on the head; the erect appendage to the nose moderate in size, and heart-shaped, the foliaceous appendage

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of the hke shape, but very large. *Tragus semicordate*.  
Body about four inches long.

*Vespertilio Spasma*, *Lin.* 1. 47. *Glis Volans Ternatanus*,  
*Seba*, *Thes. tom.* 1. *Megaderma Spasma*, *Geoff. Ann. Mus.*  
*tom.* xv. 195.

Icon. *Seba*, *Thes. pl.* 56. f. 1. *Geoff. Ann. du Mus. pl.* 12.  
*Schreber*, f. 48. *Shaw*, *Gen. Zool.* 1. f. 42.

Inhabits the Isle Ternate.

212. 2. *M. Lyra* (Lyre Leaf Megaderme Bat.) Red on the  
back, yellow underneath; with the nasal appendages so dis-  
posed as to assume the shape of a lyre. Body three inches  
long; expanse of wings fourteen inches.

*Megaderma Lyra*, *Geoff. Ann. Mus. tom.* xv. 190-198.

Icon. *Ann. Mus.* xv. pl. 12.

Habitat unknown.

213. 3. *M. Frons* (Foliaceous Megaderme Bat of Dau-  
benton.) Cinereous, with a slight tinge of yellow; folia-  
ceous appendages two, one horizontal, and the other ver-  
tical, resembling a leaf. Body nearly three inches long.

*Megaderma Frons*, *Geoff. Ann. Mus. tom.* xv.

*La Feuille*, *Daub. Mém. de l'Académie des Sciences, An.*  
1759.

Inhabits Senegal.

214. 4. *M. Trifolium* (the Loro of Java.) Mouse-colour,  
with the inner auricle trifoliated. Body three inches long;  
expanse of wings, about a foot.

*Megaderma Trifolium*, *Geoff. Ann. Mus. tom.* xv.

Icon. *Geoff. Ann. du Mus. pl.* 12.

Inhabits Java.

X. RHINOLPHUS. Geoffroy. *Incisive teeth*  $\frac{2}{2}$ , the upper  
incisors very small, and not permanent; canine,  $\frac{1}{1}$ ; cheek-

## SYNOPSIS OF THE

*teeth,  $\frac{4}{3}$ , furnished with sharp points, = 30. Nose furnished with a crest, shaped like a horse-shoe, and surmounted with a leaf. Ears distinct. Interfemoral membrane large. Two pectoral mammæ, and two warts on the pubes, having the appearance of mammæ, but destitute of lactiferous glands. Tail long, free.*

215. 1. *R. Ferrum Equinum* (Horse-shoe Rhinolophus Bat.) Ash colour, mixed with red above; yellowish-gray beneath; membrane black; ears long and pointed; the anterior nasal membrane like a horse-shoe, the posterior assimilated to a lance head; the length of body about three inches; expanse of wings sixteen inches.

*Vespertilio Ferrum Equinum*, var. A. *Lin.* *Noctilio Ferrum Equinum*, *Kuhl, Deutsch. Fledermaus.* *Rhinolophus Major*, and *R. Unihastatus*, *Geoff. Collection du Mus. &c. Ann. Mus. tom. xx.* *Vespertilio Hippocrepis.* *Herman, 257. Obs. Zool.*

Grand Fer-à-Cheval, *Daubenton, Mém. de l'Acad. 1759.*

*Icon. Buffon, tom. VIII. pl. 20. fig. 1 and 2.* Head, *Horsfield's Java, No. 6.*

Inhabits Europe.

*Obs.* This and the succeeding, have generally been treated, especially lately, by Dr. Kuhl, as mere varieties. Geoffroy St. Hilaire, however, considers them as distinct, both by the nasal membrane, and the form of the ears.

216. 2. *R. Ferrum Equinum Minor* (the Lesser Horse-shoe Bat.) Similar to the last, but the appendage forming a double spear head, and less in dimensions.

*Vespertilio Ferrum Equinum*, var. B. *Lin.* *V. Hipposideros*, *Bechstein, Leach, Zoological Miscellany.* *V. Minutus*, *Montagu, Linnæan Transactions, ix. 163.* *Rhinolophus Bihastatus*, *Geoff. Ann. Mus. xx. 295.*

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Icon. *Leach, Zool. Misc. tom. III. p. 121. Buffon, tom. VIII. pl. 17. f. 2. Geoffroy, Ann. Mus. tom. xx. pl. 5.*

Inhabits Europe, including England.

217. 3. *R. Tridens* (Trident Rhinoloph Bat.) Nasal appendage simple, erect, and tridented; body about two inches long; expanse of wings, ten inches.

*Rhinolophus Tridens, Geoff. Disc. de l'Egypte, tom. II. and Ann. Mus. tom. xx. 260.*

Icon. *Geoffroy's Egypt, tom. II. pl. 2.*

Inhabits Egypt.

218. 4. *R. Speoris* (Pitnosed Rhinoloph Bat.) Reddish-gray; nasal leaf simple, rounded; with a purse or cavity on the forehead.

*Vespertilio Speoris, Schneider. Rhinolophus Marsupialis, Geoff. Cour. Public. 1805.*

*Rhinolophe Cruminifere, Peron and Lesueur, Voyage to Australasia. Pitnosed Bat, Shaw, Zool. I.*

Icon. *Peron and Lesueur, Voy. Aust. Atlas, pl. 35.*

Inhabits the Isle of Timor.

219. 5. *R. Diadema* (Diadem Rhinoloph Bat.) Brighter red than the other species; nasal appendage disposed like a diadem; tail as long as the thighs; no frontal cavity; body about four inches long.

*Rhinolophus Diadema, Geoff. Ann. Mus. tom. xx.*

Icon. *Ann. Mus. pl. 5, the head; pl. 6, the animal entire.*

Inhabits the Isle of Timor.

*Obs.* The *R. Commersonii*, described by M. Geoffroy, in the *Ann. Mus. tom. xx.* differs from *R. Diadema* principally in having the tail a third shorter, and the foliaceous appendage about a third less; the interfemoral membrane terminates by a re-entering angle. It has been seen and noticed only by Commerson, and its specific distinctness seems doubtful.

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220. 6. *R. Affinis*. Yellowish-brown above, yellow underneath, deeper on the throat and breast; tail shorter than the legs; cartilaginous septum of the nose crooked; ears large, bent at the outer side, with a large accessory lobe at their base, size of Horse-shoe Bat.

Rhinolophus Affinis, *Horsfield's Java*.

Icon. —

Inhabits Java.

221 7. *R. Minor*. Lead colour, or silvery above, gray underneath; septum, tail, and ears, like the last; expanse of wings nine inches.

Rhinolophus Minor, *Horsfield's Java*.

Icon. —

Inhabits Java.

222. 8. *R. Nobilis*. Pure brown above, varied with gray underneath; the nasal membrane extended across the nose, in the form of a shelf; tail as long as the legs; expanse of wings nineteen inches and a half.

Rhinolophus Nobilis, *Horsfield's Java*.

Icon. —

Inhabits Java.

223. 9. *R. Larvatus*. Deep brown above, with a golden lustre, more intense posteriorly; membrane blackish brown, with a yellowish tint, varying according to the disposition of the light; expanse of wings twelve inches and a half.

Rhinolophus Larvatus, *Horsfield's Java*.

Icon. —

Inhabits Java.

224. 10. *R. Vulgaris*. Brown above, uniform gray beneath; tail a little longer than the feet; upper nasal membrane stretched transversely; ears patulous, with a hairy

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lobule at the base ; expanse of wings twelve inches and a half.

*Rhinolophus Vulgaris*, *Horsf. Zool. Java, No. vi.*

Icon. —

Inhabits Java.

225. 11. *R. Deformis*. Brown above, gray underneath ; skull elongated, and compressed ; upper nasal membrane transverse ; large, erect, approximated ears ; expanse of wings twelve inches.

*Rhinolophus Deformis*, *Horsf. Zool. Java, No. vi.*

Icon. —

Inhabits Java.

226. 12. *R. Insignis*. Dark-brown above ; tail a little longer than the feet, with an elongated frontal sinus between the skin and the skull ; mouth contracted, ascending transversely ; upper nasal membrane transverse, and partially concave ; ears large and patulous, with the extremity nearly circular.

*Rhinolophus Insignis*, *Horsf. Zool. Java, No. vi.*

Icon. —

Inhabits Java.

XIV. NYCTERIS. Geoffroy. *Incisive teeth*  $\frac{1}{2}$ , lobed ; canine  $\frac{1}{1}$  ; cheek-teeth  $\frac{1}{1}$ , with sharp tubercles, = 30. Nostrils covered with a cartilaginous and moveable operculum. Forehead with deep longitudinal groove. Interfemoral membrane larger than the body ; comprehending the tail, which is terminated in the form of the letter T ; with a pouch on each side of the mouth, communicating to a large membranaceous sac, formed by the skin of the body, according to M. Geoffroy.

227. 1. *N. Hispidus* (the Rough-haired Nycteris Bat.)  
Reddish brown above ; under parts, head, except the crown,

SYNOPSIS OF THE

throat, breast, and belly, yellowish-white; ears large, tragus simple; length of body, an inch and a half; expanse of wings, eight or nine inches.

Vespertilio Hispidus, *Gm. Syst. Nat.* Nycteris Daubentonii, *Geoff. Egypt.* 11. 387.

Compagnol Volant, *Daub. Mém. de l'Acad. des Sciences, An.* 1759. Autre Chauve-souris, *Buffon*, x.

Icon. *Buff.* tom. x. pl. 20. f. 1 & 2.

Inhabits —

228. 2. *N. Geoffroyii*, (Geoffroy's Nycteris.) Gray-brown above, lighter underneath; ears very large, tragus spiral; lower lip having a large wart at its extremity, situated between two lengthened furrows, in form of the letter V.

Nycteris Geoffroyii, *Desm. Mam.* 127. Nycteris Thebaida, *Geoff. Egypt, tom.* 11.

Icon. *Geoff. Egypt.* 11. pl. 1. fig. 2. and *Skull, f. 4. f.* 111.

Inhabits Egypt, and probably Senegal.

229. 3. *N. Javanica* (Nycteris Bat, of Java.) Bright-red on the upper part of the body, reddish ash-colour underneath.

Nycteris Javanica, *Geoff. Egypt, Hist. Nat. tom.* 11.

Icon. —

Inhabits Java.

XV. RHINOPOMA. Geoffroy. *Incisive teeth*  $\frac{2}{2}$ , the upper incisors separated from each other; canine teeth  $\frac{1}{1}$ ; cheek-teeth  $\frac{4}{4}$ ; nose long, truncated, and surmounted with a small leaf, nostril operculated; ears large, united, and hanging over the face; inner ears; forehead large, concave; inter-femoral membrane narrow, and cut square; tail long, extending beyond the membrane.

230. 1. *R. Microphylla* (Small-leaved Rhinopome Bat.)

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Ash coloured; tail very long and thin; nostrils capable of being closed and opened at the will of the animal, as in the Seals.

Vespertilio Microphyllus, *Brunnich, Description of the Copenhagen Museum.* Rhinopoma Microphylla, *Desm. Mam.* 129.

Chauve-Souris d'Egypte, *Bâlon, de la Nature des Oiseau,* book II. ch. 19.

Icon. *Brunnich, l. c.* vi. p. 50. f. 1, 2, 3, and 4.

Inhabits the Pyramids of Egypt.

231. 2. *R. Caroliniensis* (Rhinopome Bat of Carolina.) Brown, with a tail long, but thicker than in the preceding species.

*Rhinopoma Caroliniensis*, *Geoff. Col. Mus. Desmarest, Nouveau Dict. d'Hist. Nat. tom. xxix. p. 258.*

Inhabits Carolina, according to M. Brongniart, the possessor of the individual described by Desmarest.

*Obs.* M. Geoffroy is of opinion that this is not a true *Rhinopoma*.

XVI. TAPHOZOUS. Geoffroy. *Incisive teeth*  $\frac{2}{2}$ ; *canine*  $\frac{1}{1}$ ; *cheek-teeth*  $\frac{4}{4}$ ; *a furrow on the nose, as in the two preceding divisions, but not furnished with a laminous appendage; ears moderate, separated from each other; no external lesser ears; interfemoral membrane large, tail not so long as the membrane, and exerted on its upper side.*

232. 1. *T. Senegalensis* (the Taphozous Bat of Senegal.) Brown above, mixed with ash-colour on the under parts.

*Taphozous Senegalensis*, *Geoff. Descrip. Egypt. Hist. Nat.* II. 127.

Loret Volant, *Daubenton, Mém. de l'Acad. des Sci. Année* 1759.

SYNOPSIS OF THE

Icon. —

Inhabits Senegal.

233. 2. *T. Mauritanus* (Taphozous Bat of the Mauritius.)  
Brownish red colour above, inclining to red underneath;  
nose more pointed than in the preceding; tail shorter than  
the thighs; inner ears, with a sinewy edge.

Taphozous Mauritanus, *Geoff. Descrip. Egypt.* II. 127.

Icon. —

Inhabits the Isle of France.

234. 3. *T. Perforatus* (the Perforated Taphozous Bat.)  
Red-gray above, cinereous beneath, but the lower part of  
each hair white; inner ears in form of a hatchet, and ter-  
minated by a rounded edge.

Taphozous Perforatus, *Geoff. Descrip. Egypt.* II. 127.

Icon. *Geoffroy, l. c. pl. 3. n. 1. Skeleton and head, f. 4.  
f. 4. 4. 4.*

Inhabits the ancient buildings of Egypt.

*Obs.* M. Desmarest thinks it probable that this and the  
*T. Senegalensis* are the same.

235. 4. *T. Lepturus* (Slender-tailed Taphozous Bat.) Gray,  
paler underneath; membrane folding so as to form a sort  
of pocket.

Taphozous Lepturus, *Geoff. Descrip. Egypt.* II. 126.  
*Vespertilio Lepturus, Schreb. I. 173. V. Marsupialis,  
Muller. Naturfoscher, Supp. 19. Saccopteryx Lepturus,  
Illiger, Prodromus.*

Pouched Bat and Slender-tailed Bat, *Pennant, Quad.* 312  
and 315.

Icon. *Schreb. Saught. 1. tab. 57.*

Inhabits Surinam.

*Obs.* M. Geoffroy thinks this species is indigenous in  
India, and not at Surinam.

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XVII. MYOPTERIS. Geoffroy. *Incisive teeth*  $\frac{3}{2}$ , those below bilobed; canine  $\frac{1}{1}$ ; cheek-teeth  $\frac{4}{4}$ ; nose without leaf, membrane, or furrow; muzzle short and thick.

236. 1. *M. Daubentonii* (Daubenton's Myopteris Bat.) Top of the head and back brown; the under parts pale white, with a slight tinge of yellow.

*Myopteris Daubentonii*, Geoff. *Deasip. Egypt.* II. 113. Rat Volant, Daubenton, *Mém. de l'Acad. des Science, Ann.* 1759.

Icon. —

Habitat unknown.

XVIII. CELÆNO. Leach. *Incisive teeth*  $\frac{3}{2}$ , the upper acuminate and simple, the lower formed, as it were, of four columns; cheek-teeth  $\frac{4}{4}$ ; the anterior teeth, in both jaws, acuminate, the three posterior acutely tuberculated.

237. 1. *Celæno Brooksiana* (Brooks's Celæno Bat.) Back ferruginous; belly and shoulders yellowish; membrane black; ears acuminate, distinct, the anterior margin rounded, the posterior straight; oreillon very small; tail doubtful.

*Celæno Brooksiana*, Leach, *Lin. Trans. tom. XIII. p. 70.*

Icon. —

Habitat unknown. Mus. Mr. Brooks.

XIX. AËLLO. Leach. *Incisors*  $\frac{2}{2}$ ; cheek-teeth  $\frac{4}{2}$ , the two upper anterior acuminate, the third bifid, and the fourth with three edges; in the lower jaw, the three anterior acuminate, the three posterior bifid.

238. 1. *A. Cuvieri* (Cuvier's Aëllo Bat.) Isabella ferruginous-colour; wings dark-brown; ears short, approximated, broad; no oreillon; tail not reaching beyond the interfemoral membrane.

SYNOPSIS OF THE

Aëlo Cuvieri, *Leach, Lin. Trans. tom. XIII. p. 71.*

Icon. —

Habitat unknown. Museum of Mr. Brooks.

XX. SCOTOPHILUS. Leach. *Incisive teeth  $\frac{3}{4}$ ; in the upper jaw the two lateral teeth shorter; cheek-teeth  $\frac{3}{8}$ , furnished with acuminated processes.*

239. 1. *S. Kuhlii* (the Scotophilus Bat of Kuhl.) Ferruginous, with the ears, nose, and wings, brown; ears distinct; oreillon small; tail reaching to the end of the membrane.

*Scotophilus Kuhlii, Leach, Lin. Trans. tom. XIII. pl. 1. p. 72.*

Icon. —

Habitat. — ? Mus. of Mr. Brooks, and British Museum.

XXI. ARTIBEUS. Leach. *Incisive teeth  $\frac{4}{5}$ , the two intermediate in the upper jaw the largest; in the lower jaw, truncated, the two intermediate the largest, reeded in front; cheek-teeth  $\frac{2}{10}$ ; the hinder teeth small.*

240. 1. *A. Jamaicensis* (Jamaica Artibeus Bat.) Dark-brown above, mouse-coloured underneath; the ears, nasal appendages, and membranes, dark-brown, with two nasal appendages, one horizontal, the other vertical and acuminated, marked with a streak anteriorly; no tail.

*Artibeus Jamaicensis, Leach, Lin. Trans. tom. XIII. pl. 1. p. 75.*

Icon. —

Habitat Jamaica. British Museum.

XXII. DIPHYLLA. Spix. *Incisive teeth  $\frac{3}{4}$ , the upper middle largest, apex six pointed; canine teeth  $\frac{1}{11}$ , scarcely exerted; cheek-teeth  $\frac{4}{11}$ ? or  $\frac{3}{8}$ ? short apex crenulated; lips*

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*smooth; nose with two short, erect, truncated leaves, placed close together, and not elongated on the sides; the hinder legs nearly as long as the arms; tail and interfemoral membrane deficient.*

241. 1. *D. Ecaudata* (Tail-less Diphylla Bat.) Body hairy-woolly; back fuscous-brown; head and abdomen beneath, brownish-gray; wings blackish, nearly naked; face near the ears nearly naked.

*Diphylla Ecaudata, Spix, Sim. Braz. 68.*

*Icon. Spix, Sim. Braz. 136. f. 7.*

*Inhab. Brazils.*

*Obs.* This sub-genus is very peculiar for its two leaves, from whence its name. Dr. Spix describes the cheek-teeth eight above, and eight below, but he does not state whether he means eight or four on each side; in some places, where he describes them in the same way, he evidently means the former, as his context illustrates, and in others, the latter.

XXIII. MONOPHYLLUS. Leach. *Incisive teeth 4, the two intermediate the largest; canine teeth 11; cheek-teeth 44, the two first, in the upper jaw, distant, the rest tuberculated on both edges; the second and third, in the lower jaw, with a space between them.*

242. 1. *M. Redmani* (Redman's Monophyllus Bat.) Brown above, mouse-colour beneath; all the membranes, ears, and nasal appendage brown. But one nasal appendage erect, and acute; ears round; beard elongated.

*Monophyllus Redmani, Leach, Lin. Trans. tom. XIII. pl. 1. p. 76.*

*Icon. —*

*Habitat. Jamaica.*

SYNOPSIS OF THE

XXIV. DYSOPES. F. Cuv. *Incisive teeth* 3, *upper close, elongate, elliptical*; *canine* 11; *cheek-teeth* 44.

243. 1. *D. Mops*.

*Dysopes Mops*, F. Cuv. *Dents de Mamm.* 49.

Icon. —

Inhab. India.

M. F. Cuvier has given no further characters of this sub-genus.

XXV. NYCTOPHILUS. Leach. *Incisive teeth* 3, *the upper elongated, conical, and short, the under equal; with three cutting-edge, jagged, canine teeth* 11; *cheek-teeth* 44; *the first, in the upper jaw, acute, and with one tubercle; the second and third with four tubercles, and the fourth with three. In the lower jaw, the first is acute and conical, the other three tuberculated.*

244. 1. *N. Geoffroyi* (the Nyctophilus Bat of Geoffroy.)  
Back dirty-brown, under parts whitish; ears broad; membrane blackish; tail as long as the interfemoral membrane; two nasal appendages, erect, the posterior the longest.

*Nyctophilus Geoffroyi*, Leach, *Lin. Trans. tom. XIII. pl. 1. p. 78.*

Icon. —

Inhabits

XXVI. THYROPTERA. Spix. *Teeth* —? *body slender, small; nose simple; wings very narrow, running down to the tarsus; thumb of the hand armed below with a rather concave patella; interfemoral membrane expanded, not extending beyond the feet; tail long, exerted beyond the membrane.*

245. 1. *T. Tricolor* (Three-coloured Thyroptera.) Body

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above fuscous brown, beneath pure white; wings and legs pure black.

Thyroptera Tricolor, *Spix, Sim. Braz.* 61.

Icon. *Spix, Sim. Braz. t.* 36. *f.* 69.

Inhab. Shores of the Amazon, Brazils.

XXVII. PROBOSCIDEA. *Spix.* *Incisive teeth*  $\frac{3}{3}$ , *upper very small, distant, diverging, lower lobed, placed in a semi-circle; canine teeth*  $\frac{11}{11}$ ; *cheek*  $\frac{5\frac{1}{2}}{5\frac{1}{2}}$ , *the front one small, and the rest with many tubercles; wings narrow; tail long, half involved in the interfemoral membrane.*

246. 1. *P. Saxatilis* (Rock Proboscidea.) Body, above, variegated with gray and brown; beneath, ash mouse-colour; wings and feet fuscous brown.

Proboscidea Saxatilis, *Spix, Sim. Braz.* 62.

Icon. *Spix, Sim. Braz. t.* 35. *f.* 8.

Inhab. rocky places on the shores of St. Francis, in Brazil.

247. 2. *P. Rivalis* (River Proboscidea.) Body smaller; above fuscous brown, beneath pale brown.

Proboscidea Rivalis, *Spix, Sim. Braz.* 62.

Icon. —

Inhab. Shores of the Amazon, Brazils.

XXVIII. VESPERTILIO. *Lin.* *Incisive teeth*  $\frac{3}{3}$ , *the upper teeth separated in pairs, cylindrical, and pointed, the lower very close with two cutting lobes directed forward; canine teeth*  $\frac{11}{11}$ ; *cheek teeth*  $\frac{4\frac{1}{2}}{4\frac{1}{2}}$ ,  $\frac{3\frac{1}{2}}{3\frac{1}{2}}$ ,  $\frac{4\frac{1}{2}}{4\frac{1}{2}}$ , or  $\frac{4\frac{1}{2}}{4\frac{1}{2}}$ ; *the anterior cheek teeth simply conical, the posterior having several sharp points or prominences. The nose simple, without membranaceous appendage, ridge, or furrow. Ears lateral and distinct, internal ears visible. Index finger with but one phalanx, the middle with three, the annular and little finger with two.*

*Tail not exceeding the interfemoral membrane. Sebaceous glands under the skin of the face, assuming different forms and dimensions in the different species.*

248. 1. *V. Murinus* (the Common Bat.) Reddish brown above, deeper according to the age of the individual, grayish beneath. Face nearly naked; forehead very hairy; nose prominent, exceeding the under lip; nostrils opening laterally; eyes large; ears naked, inclined backwards, separate, with the points turning forward. Length of body about four inches; expanse of wings nearly eighteen inches.

*Vespertilio murinus*, *Linnaeus*, *Sys. Nat.* i. 47. *V. Myotis*, *Bechstein and Kuhl*, *Deut. Flederm. sp.* 4, from an aged individual. *V. Major Vulgaris*, *Klein*, *Quad.* 61. *La Chauve-souris*, *Buff. t.* viii.

Common Bat, *Pennant*, *Quad.* ii. 119. Short-eared English Bat, *Edwards's Birds*, 201.

*Icon. Buff.* viii. pl. 20. *Ann. Mus. t.* viii. pl. 47 and 48. *Schreb. tab.* 51. *Ency. Méthod. f.* 33. f. 2. *Edwards's Birds*, f. 201. f. 2. *Pennant's Brit. Zool.* i.

Inhabits Europe, and probably the eastern parts of Asia.

249. 2. *V. Serotinus* (the Serotine Bat.) Back red-brown colour, brighter in the females. Membrane black. Ears oval, but approaching a triangle; inner ears pointed. Length of body under three inches; expanse of wings about fourteen inches.

*Vespertilio Serotinus*, *Gmel. Sys. Nat.* i. 41. *Vespertilio Noctula*, *Geoff. Ann. Mus.* viii. 193. *Blasse Fledermaus*, *Speck-fledermaus*, and *Spatling of the Germans*. *La Serotine*, *Daub. Buff. t.* viii.

*Icon. Buff. l. c.* pl. 18. *Schreb. tab.* 53. *Geoff. Ann. du Mus.* viii. pl. 47 and 48. *Daub. Mém. Acad. Sci.* 1759, f. 2. f. 1.

Habitat. Europe and Great Britain

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250. 3. *V. Noctula* (the Noctule Bat.) Body yellow, with the membranes brown-black. Ears like those of the Serotine, but rather less in proportion to the head. Length of body about three inches; expanse of wings about sixteen inches.

*Vespertilio Noctula*, *Herman's Obs. Zool.* 17. *Gmelin, Sys. Nat.* i. 48. *V. Lasiopterus*, *Schreb.* *V. Proterus*, *Kuhl, Deutch Flederm.* 33. *V. Serotinus*, *Geoff. Ann. Mus.* viii.

Noctule Bat, *Pennant's Quad.* 369. La Noctule, *Daubenton, Mém. Acad. Sci.* 1759, 380. Great Bat, *Pennant's Brit. Zool.* i.

Icon. *Schreb. Saugth, tab.* 58. *Daub. Mém. de l'Acad. &c.* 1759, *tab.* 15. *f.* 1. Young, *F. Cuv. Mam. No.* 38, *t.* 3.

Inhabits the whole of Europe, but especially Germany.

*Obs.* The Noctule and the Serotine have been very much confounded. Dr. Kuhl has given the distinctive characters of the two at different ages.

251. 4. *V. Pipistrellus* (the Pipistrelle.) Back blackish brown, under parts inclining to yellow. Ears shaped like those of the preceding; inner ears rounded at their termination. Length of body little more than an inch; expanse of wings about seven inches.

*Vespertilio Pipistrellus*, *Lin. Schreb. Geoff. Kuhl.*

La Pipistrelle, *Daub. Mém. de l'Acad. &c.* 1759. The Pipistrelle, *Pen. Quad.* ii. 318.

Icon. *Daubenton, l. c. fig.* 3. *Buff. t.* viii. *pl.* 18. *f.* 2. *Schreb. tab.* 54. *Geoff. Ann. Mus. t.* viii. *pl.* 47 and 48.

Inhabits various parts of Europe.

Var. a. With the points of the hairs ash-coloured; found in Egypt by M. Geoffroy.

Icon. *Geoff. Descrip. d'Egypte, f.* 1. *f.* 3. *Skull, f.* 4. *f.* 585.

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252. 5. *V. Pictus* (the Kirivoula, or Striped Bat.) Back of a bright yellowish red colour, yellow underneath; fingers along the wings bright yellow; membrane brown red. Length of body about two inches; expanse of wings about eight inches.

*Vespertilio Ternatanus*, *Seba, Thes. V. Pictus, Gm. Pallas, Geoff. V. Kirivoula, Boddaert, Elench. Anim.*

Striped Bat. *Pennant. Muscardin Volant, Daub. Mem. de l'Acad. 1759.*

*Icon. Ann. du Mus. t. VIII. pl. 48. Buff. t. x. pl. 20. Seba, Thes. tab. 56, fig. 23.*

Inhabits the East Indies, especially Ceylon, where it is called Kirivoula.

253. 6. *V. Lasiurus* (Rough-tailed Bat.) Colour varied between yellowish gray and bright red; tail thick; ears oval and short. Length of body about two inches; expanse of wings about ten.

*Vespertilio Lasiurus, Gm.*

Rough-tailed Bat, *Pennant, Shaw.*

*Icon. Ann. Mus. t. VIII. pl. 47. Schreb. tab. 62, B.*

Inhabits Cayenne.

254. 7. *V. Nigrita* (Senegal Bat.) Yellow-brown above, ashy brown underneath. Ears smaller than in most of the *Vespertiliones*. Length of body about three inches; expanse of wings about fifteen.

*Vespertilio Nigrita, Gmel.*

Marmotte Volante, *Daub. Mém. de l'Acad. 1759. Chauve-souris Etrangère, Buff. t. x. Senegal Bat, Pennant, Quad. 281.*

*Icon. Buff. l. c. pl. 18. Schreb. Saugt. tab. 58. Ann. Mus. t. VIII. pl. 47.*

Inhabits Senegal.

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255. 8. *V. Nasutus* (Great Serotine Bat.) Red-brown colour on the back, bright yellow on the flanks, pale yellow on the belly. Muzzle long and pointed.

*Vespertilio Nasutus*, *Shaw. Gen. Zool. t. i. 142.*

Grande Serotine de la Guyane, *Buff. Supp. t. vii. Great Serotine, Pennant, Quad. t. ii. 318.*

Icon. *Buff. l. c. pl. 73.*

Inhabits Guyane.

256. 9. *V. Pygmæus* (Pigmy Vespertilio Bat.) Brown, deeper on the back and head than on the under part; muzzle short and obtuse; ears shorter than the head, broad at the base, rounded, tragus linear. Expanse of wings about five inches.

*Vespertilio Pygmæa*, *Leach, Zool. Journal, iv. 589.*

Icon. *Zool. Journal, iv. f. 22.*

Inhabits Devonshire.

*Obs.* Nearly allied to *V. Pipistrellus*.

257. 10. *V. Braziliensis* (Brazil Vespertilio Bat of Spix.) Black wings.

*Vespertilio Braziliensis*, *Spix, Brazil, 63.*

Icon. *Spix, Brazil, t. 36. f. 8.*

Inhabits Brazil.

258. 11. *V. Hilarii* (Vespertilio Bat of Isidore St. Hilaire.) Ears small and triangular; tail as long as fore-arm; interfemoral membrane naked.

*Vespertilio Hilarii*, *Isidore Geoffroy St. Hilaire, Ann. des Sciences Nat. iii. 440.*

Icon. —

Inhabits Brazil.

259. 12. *V. Polytrix* (Indented Vespertilio.) Ears small, notched at the external margin; tail as long as fore-arm;

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interfemoral membrane with scattered hairs on the upper side; face hairy.

*Vespertilio Polythrix*, *Isidore Geoffroy St. Hilaire, Ann. des Sciences Nat.* III. 440.

Icon. —

Inhabits Brazil.

260. 13. *V. Lævis* (Smooth *Vespertilio*.) Ears long; tail as long as the body; face partly naked.

*Vespertilio Lævis*, *Isidore Geoff. St. Hilaire, Ann. Sci. Nat.* III. 445.

Icon. —

Inhabits Brazil.

261. 14. *V. Temminckii* (Temminck's *Vespertilio* Bat.) Head cuneate, top and sides flat; ears shorter than the head, oblong, rounded; tragus elongate, falcate. Fur silky, hair very short, olive-brown, beneath dirty yellow, sides pale rufous. Incisive teeth  $\frac{3}{4}$ .

*Vespertilio Temminckii*, *Horsf. Java, No. 8.*

Icon. *Horsfield's Java, No. 8.*

Inhabits Java.

262. 15. *V. Adversus*. Head wedge-shaped, high behind; muzzle, snout, broad; ears erect, tragus linear. Fur rather woolly, hairs long, above shining gray-brown, underneath whitish ash-coloured. Incisive teeth  $\frac{3}{4}$ ; canine  $\frac{11}{11}$ ; cheek teeth  $\frac{3}{3}$ .

*Vespertilio adversus*, *Horsfield's Java, No. 8.*

Icon. —

Inhabits Java.

263. 16. *V. Hardwickii* (Hardwicke's Bat.) Head globose, tumid; muzzle short, depressed, lower cutting teeth simple. Ears very broad, lobes round, produced concave;

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tragus linear, lanceolate, erect. Fur woolly, very soft, hairs very long, basis woolly; above brown ash-coloured, underneath dirty gray. Incisive teeth  $\frac{3}{3}$ ; canine  $\frac{11}{11}$ ; cheek teeth  $\frac{44}{44}$ .

*Vespertilio Hardwickii*, *Horsfield's Java*, No. 8.

Icon. —

Inhabits Java.

264. 17. *V. Tralatitius* (Transposed *Vespertilio*.) Head wedge-shaped, above broad, face bristly. Ears large, flat, broad; tragus linear, erect, blunt. Fore-arm long. Fur soft, sooty black. Incisive teeth  $\frac{3}{3}$ ; canine  $\frac{11}{11}$ ; cheek teeth  $\frac{44}{44}$ . Body three inches; expanse of wings ten inches.

*Vespertilio Tralatitius*, *Horsf. Java*, No. 8.

Lowo-Manir, *Javaneesse*.

Icon. —

Inhabits Java.

265. 18. *V. Imbricatus* (Tiled Bat.) Head and snout short, broad. Ears broad, obtuse; tragus short, semilunar. Fur shining fulvous brown; eyes and upper side of ears covered with thick fur. Incisive teeth  $\frac{3}{3}$ ; canine teeth  $\frac{11}{11}$ ; cheek teeth  $\frac{44}{44}$ .

*Vespertilio Imbricatus*, *Horsfield's Java*, No. 8.

Icon. —

Inhabits Java.

266. 19. *V. Carolinensis* (Carolina *Vespertilio* of Geoffroy.) Brown-red above, yellow underneath. Ears oblong, tragus semicordate.

*Geoff. Ann. Mus. t. viii. pl. 47.*

Icon. *Geoff. l. c. viii. 47.*

Inhabits South Carolina.

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267. 20. *V. Discolor* (Dingy Vespertilio.) Hairs of the back brown, with the points white; under parts pale white. *Vespertilio discolor*, *Natterer*.

Icon. *Kuhl, Fledermaus*, 43.

Inhabits Europe.

268. 21. *V. Emarginatus* (Bordered-eared Vespertilio.) Reddish gray above, ash-coloured underneath.

*Vespertilio Emarginatus*, *Geoff. Ann. Mus. t. VIII. pl. 46* and 48.

Icon. —

Inhabits Great Britain and the north of France.

269. 22. *V. Mysticinus* (Red-brown Vespertilio of Leisler.) Hairs of the back brown, tipped with brown-red; some hairs on the upper lip in form of whiskers.

*Vespertilio Mysticinus*, *Leisler, Kuhl, Deut. Flederm.* 58.

Icon. —

Inhabits Europe.

270. 23. *V. Borbonicus* (Bourbon Vespertilio.) Red above, white underneath.

*Vespertilio Borbonicus*, *Geoff. Ann. Mus. t. VIII. pl. 46*.

Icon. —

Inhabits Isle of France.

271. 24. *V. Brasiliensis* (Brazilian Vespertilio of Desmarest.) Dark brown, each hair tipped with chestnut; membrane chestnut and black.

*Vespertilio Brasiliensis*, *Desmarest, Nouveau Dict. d'Hist. Nat. t. xxxv*.

Icon. —

Inhabits Brazil.

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272. 25. *V. Bechsteinii* (Bechstein's Vespertilio.) Red-gray above, white underneath.

*Vespertilio Bechsteinii*, *Kuhl, Deutsch Flederm.*

Icon. *Kuhl, Deutsch Flederm. pl. 22.*

Inhabits

273. 26. *V. Nattererii* (Natterer's Vespertilio.) Yellow-gray above, white underneath. Membrane dark gray, interfemoral membrane in festoons.

*Vespertilio Nattererii*, *Kuhl, Deut. Flederm. pl. 25.*

Icon. *l. c. f. 23.*

Inhabits Europe, England.

274. 27. *V. Leisleri* (Leisler's Vespertilio.) Hair long, deep brown, but tipped with red-brown colour; lower sides of the membranes along the arms very hairy.

*Vespertilio Leisleri*, *Kuhl, Deutsch Flederm.* *V. Dasicarpus*, *Leisler.*

Icon. —

Inhabits Europe.

275. 28. *V. Schreibersii* (Schreiber's Vespertilio.) Ashy gray above, paler beneath, sometimes mixed with yellowish white.

*Vespertilio Schreibersii*, *Kuhl, Deutsch Flederm.*

Icon. —

Inhabits Europe.

276. 29. *V. Kuhlii* (Kuhl's Vespertilio.) Bright brown-red above, yellow beneath.

*Vespertilio Kuhlii*, *Kuhl, Deutsch Flederm.* Discovered by Natterer at Trieste.

Icon. —

Inhabits Europe.

SYNOPSIS OF THE

277. 30. *V. Daubentonii* (Daubenton's Vespertilio.) Gray-red above, white beneath.

Vespertilio Daubentonii, Kuhl, *Deutsch Flederm.* 51.

Icon. Kuhl, *l. c. t.* 25, *f.* 2.

Inhabits Europe.

The three following American species from d'Azara are referred by Geoffroy to the Vespertiliones. Desmarest inclines to the opinion that they belong rather to the divisions established by M. Rafinesque, which he has named Hypercodon and Nycticeius, but without sufficiently pointing out their distinctive characters.

278. 31. *V. Villosissimus* (Shaggy Vespertilio.) Pale brown; ears like those of a Rat. The seventh Bat of Azara's *Quad. of Paraguay*, Geoff. *Ann. du Mus. t.* VIII.

279. 32. *V. Ruber* (Red Vespertilio.) Red on the upper parts, yellow underneath; ears like the preceding. Eleventh Bat of Azara's *Quad. of Paraguay*. Geoff. *Ann. Mus. t.* VIII.

280. 33. *V. Albescens* (Silvery or Black Vespertilio.) Nearly black, with white points on the back; ears like the preceding. Twelfth Bat of Azara, *Quad. of Paraguay*. Geoff. *Ann. Mus. t.* VIII. *pl.* 18.

Azara describes a variety of this with more white about the lower part.

XXV. PLECOtus. Geoff. *Incisives*  $\frac{4}{8}$ ; *canines*  $\frac{11}{11}$ ; *cheek teeth*  $\frac{5}{5}$ . *Ears larger than the head, and united at their base. In other respects, agrees with Vespertilio.*

281. 1. *P. Auritus* (the Long-eared Bat.) Gray, darker above than underneath. Length of body nearly two inches; expanse of wings eleven or twelve inches.

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*Vespertilio Auritus*, *Lin.*

L'Oreillard, *Daub. Mem. de l'Acad. des Sciences*, 1759.

Long-eared Bat of *English naturalists*.

Icon. *Daubenton*, l. c. tab. 1, f. 2. *Buffon*, t. VIII. pl. 17.

*Schreiber*, tab. 50. *Edward's Birds*, t. 201, f. 3. *Pennant*. *Shaw*.

Inhabits Europe, common in England.

Var. a. Of Egypt; less than the common species; rather redder; last vertebra of the tail detached from the membrane.

Icon. *Geoff. Desc. d'Egypte*, t. 2. f. 3.

Var. b. Of Austria; bigger than our variety, colour deeper.

282. 2. *P. Barbastellus* (the Barbastel.) Deep brown, with the point of each hair yellow; membrane black. About as big as the *Auritus*.

*Vespertilio Barbastellus*, *Gm.* 1, 40.

La Barbastelle, *Daub. Mém. de l'Acad.* 1759. *Pennant's Quadrupeds*, II. 319.

Icon. *Daub. l. c. pl. 2. f. 3.* *Buffon*, t. VIII. f. 19. *Schreb. tab. 55.* *Geoff. Ann. du Mus. t. VIII, pl. 46.*

Inhabits France and Germany, but rarely met with, particularly in the former country.

283. 3. *P. Maugei* (Porto Rico Bat.) Blackish brown above, clear brown beneath, posterior part of the body white, membranes gray. Rather larger than the *Barbastel*.

*Vespertilio Maugei*, *Desmarest, Nouveau Dict. d'Hist. Nat. t: xxxv.*

Inhabits the island of Porto Rico; discovered there by *Maugé*.

284. 4. *P. Timoriensis* (Timor Bat.) Blackish brown above, ashy brown underneath. About the size of the last.

SYNOPSIS OF THE

*Vespertilio Timoriensis*, *Geoff. Ann. Mus. t. VIII.*  
Icon. *Geoff. Ann. Mus. pl. 47.*  
Inhabits the Island of Timor.

285. 5. *P. Velatus* (Veiled-eared Bat.) Chestnut above; grayish-brown beneath; tail as long as the body, entirely involved; ears long, with two longitudinal plaits, hanging over the face; auricule, elongate, naked; face, partly naked; expanse of wings thirteen inches and a half.

*Plecotus Velatus*, *Isid. Geoff. Ann. Sci. Nat. III. 446.*

Icon. —

Inhabits

M. Rafinesque has proposed three more sub-genera of Bats; but the French naturalists, not having examined the species, do not as yet admit them. His sub-genera are named: 1. *ATALAPHA*, without incisive teeth\*, including the *V. NOVABORASCENSIS* of Gm. and Pennant, and a second species he names *A. Sicilienne*.

His second sub-genera, *HYPEXODON*, has no incisors in the upper jaw, and six in the lower. It includes but one species, the *Mustache Hypexanthus*.

His third subgenus, *NYCTICEIUS*, has two incisors above, separated by a great interval, and six below. It includes the *Black Shoulder Bat*, and the *netted Bat*.

Rafinesque also describes the *Blue Wing Bat*, the *Black Back Bat*, the *Sparred Bat*, the *Monk Bat*, the *Black-faced Bat*, and the *Big-eared Bat*, but without placing them decidedly in either subdivision of the genus †.

\* It is known that these teeth occasionally fall out in the *Vespertilionidæ*, which renders this character more doubtful.

† We cannot conclude this long list of species of the *Vespertilionidæ* without, in a more particular manner, reminding the reader that we by no means vouch for the propriety of the specific distinctness of each. This, in most cases, must be left entirely to their original describers.

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Genus II. GALEOPITHECUS, PALLAS.

Incisive teeth  $\frac{3}{3}$ , the two intermediate, in the upper jaw, smaller than the others; the edges of the lower incisors indented. Canine teeth  $\frac{11}{11}$ , small, but very sharp at the point; cheek teeth  $\frac{44}{44}$ , the anterior similar to the canine teeth, the posterior furnished with several points; the membrane envelops the neck, extremities, fingers, and the tail; fingers of the hands not longer than those of the feet; nails slender and semicircular; mammæ two, pectoral.

286. 1. *G. Rufus* (the Colugo.) Fur red, lighter on the belly and internal sides of the limbs; no spots; length of body about a foot.

Lemur Volans, *Linn. Sys. Nat.* i. 45. Galeopithecus, Pallas, *Act. Acad. Sc. Peters.* 1780. 280.

Flying Macauco, *Penn.* 1, 234. Flying Colugo, *Shaw*, 1, 116. Galeopithèque Roux, *Geoff. Mag. Encycl. Audebert, Hist. Nat. des Singes.*

Icon.; *Audebert, Hist. des Singes.* Pallas, *Petersburg Transactions*, 1780, copied in *Shaw's Zool.* i. 38. *Pennant, Quad.* i. 50. copied in *Shaw, Zool.* i. 35.

Inhabits the Molucca, Philippine, and Pelew Islands.

287. 2. *G. Variiegatus* (Varied Colugo.) Brown-red, varied on the back, and the sides spotted with white; length of body, about six inches.

Galeopithecus Variiegatus, *Cuv. Tabl. Elem. des Anim.* p. 107. *Audebert, Hist. des Singes, &c.*

Icon. *Audebert, Hist. des Singes, &c. pl. 2, of the Galeopithecici.*

*Obs.* Probably either a young individual of the last preceding, or a variety of it.

288. 3. *G. Ternatensis* (the Ternate Colugo.) Grayish-red; tail slightly spotted, smaller than the preceding.

## SYNOPSIS OF THE

*Felis Volans Ternatea*, *Seba, Mus. 1. tab. 58.* Galeopithecus Ternatensis, *Geoff. Mag. Ency.*

*Obs.* Known only by Seba's short description, and is probably a variety of *G. Rufus*.

### FAMILY II.—INSECTIVORA.

Cheek-teeth furnished with various sharp points; canines, in some species, very long, in others short; in the latter case, called lateral incisors or false cheek-teeth; incisors also, varying both in number and length; teats ventral, or ventral and pectoral; legs short; mode of locomotion always plantigrade; all the feet pentadactylous, except in one species\*.

\* \* First tribe, with two long incisors in front, followed by other lateral incisors or false canines, not longer than the cheek-teeth.

### Genus I. ERINACEUS.

Incisive teeth  $\frac{3}{3}$ ; the intermediate teeth, in the upper jaw, very long, separated from each other, cylindrical, and directed forward; canine teeth  $\frac{1}{1}$ , shorter than the cheek-teeth; cheek-teeth  $\frac{4}{4}$ ; body capable of a spherical shape at the will of the animal, protected, as to the upper parts, by prickles, the under parts furnished with coarse hair; nails constructed for digging; tail short or wanting; teats ten, six pectoral, and four ventral.

289. 1. *E. Europæus* (the Common Hedgehog.) Ears short; prickles very sharp, about an inch long, set in clusters, diverging in their directions, and crossing each other, with the points white; the hair of the under part of a dirty-white colour.

*Erinaceus Europæus*, *Linn.*

\* The *Chrysochore*, which has but three toes on the anterior feet.

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Le Herisson, *Buff. tom.* VIII. Common Hedgehog, *Pennant, Quad.* 316.

Icon. *Schreb. tab.* 162. *Buffon, t. 8. pl. 6. var. A. Pennant, Quad. tab.* 28. *f.* 3.

Inhabits all the temperate parts of Europe.

*Obs.* Var. A., with shorter nose; spines less extended; hair of a deep-red. The E. Sibiricus of Erxleben appears also to be a variety of this.

200. 2. *E. Auritus* (Long-eared Hedgehog.) Ears two-thirds the length of the head; a little less than the common species.

*Erinaceus Auritus, Pallas, Nov. Com. Petrop. tom.* XIV. Herisson, d'Egypte. *Geoff. Egypt.*

Icon. *Pallas, l. c. tab.* 21. *fig.* 4. *Schreber, tab.* 163.

Inhabits North-western Asia and Egypt.

*Obs.* In Seba, *Thes. tab.* 51., is a figure of *Porcus Aculeatus*, Pendant-eared or Malacca Hedgehog; and in the same work, *tab.* 49, is another of the E. *Inauris*, Earless or American Hedgehog; but their correct classification, in this order, is doubtful.

Genus II. *Sorex*.

Incisive teeth  $\frac{3}{3}$ , in the upper jaw, indented at their base; in the lower, proceeding horizontally from their alveoli, and turned upwards towards their points, where they are sometimes of a brown colour; lateral incisors, or false canines  $\frac{1}{1}$  conical, small, shorter than the cheek-teeth; cheek-teeth  $\frac{4}{4}$ ; muzzle and nose much elongated, the latter moveable; ears and eyes small; tail varying in length, round, compressed or four-sided; pentadactylous; nails, crooked, short, curved, and pointed; teats six or eight, both pectoral and ventral; sebaceous gland, on each flank, exuding a scented unction.

SYNOPSIS OF THE

291. 1. *S. Araneus*, (Common Shrew, vulgarly called the Shrew Mouse.) Mouse-coloured, lighter underneath; tail sub-quadrated, not quite so long as the body; ears large and naked; incisors altogether white?

*Sorex Araneus*, *L.* VIII. *La Musaraigne*, *Buff.* tom. VIII.

Icon. *Daubenton*, *Mém. de l'Acad. des Sciences*, 1756. pl. 5. *Buffon*, as above, pl. 10. f. 1. *Geoff. Ann. du Mus.* t. 17. pl. 2. f. 2. *Schreb. tab.* 160.

Inhabits Europe.

*Obs.* The Shrew is subject to considerable superficial variety.

292. 2. *S. Fodiens* (the Water Shrew.) Black above, white beneath; ends of the incisors brown; tail square; ears capable of being hermetically closed, by means of three valves.

*Sorex Fodiens*, *Pallas.* *Sorex Carinatus*, *Hermann, Obs. Zool.* 46. *Sorex Daubentonii*, *Erzleb.* *Musaraigne d'eau*, *Daubenton, Mém. de l'Acad. des Sciences*, 1756. *Le Greber, Vic. d'Azyr. Syst. Anatom.* tom. III. 35.

Icon. *Schreber.* *Daubenton*, l. c. pl. 5. fig. 2. *Buffon*, tom. VIII. pl. 10.

Inhabits Europe.

293. 3. *S. Tetragonurus* (Square-tailed Shrew.) Ears short; blackish above, ashy-brown underneath; tail long, and perfectly square.

*Sorex Tetragonurus*, *Herman. Obs. Zool. Geoff. Ann. Mus.* t. 17. pl. 2. f. 3.

Icon. —

Inhabits France.

294. 4. *S. Constrictus* (Flat-tailed Shrew.) Dark ash-colour; tail flat at its insertion, and at its extremity, but round in the middle; ears hid in the fur.

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*Sorex Constrictus*, *Herman. Obs. Zool. Geoff. Ann. Mus. t. 17. S. Cunicularius*, *Bechstein*, *Musaraigne Plaron. Vicq. d'Azyr.*

Icon. *Ann. Mus.* xvii. f. 3.

Inhabits

295. 5. *S. Lineatus* (Streaked Shrew.) Brownish-black, lighter underneath; throat ash-coloured; a white streak from the forehead to the nostril, and a spot on each ear; tail round.

*Sorex Lineatus*, *Geoff. Ann. Mus. t. 17.*

Icon. —

Inhabits France.

296. 6. *S. Remifer* (Oared Shrew.) Larger than the preceding species; blackish-brown above, lighter underneath; throat ash-coloured; tail square at its insertion, but flattened towards the point.

*Sorex Remifer*, *Geoff. Ann. Mus. t. 17. pl. 2. f. 1.*

Icon. *Geoff. l. c. 12. f. 1.*

Inhabits France.

297. 7. *S. Leucodon* (White-toothed Shrew.) Back brown; belly and flanks white; tail slightly quadrated.

*Sorex Leucodon*, *Hermann, Obs. Zool. 49.*

Icon. —

Inhabits the vicinity of Strasbourg.

298. 8. *S. Indicus* (Indian Shrew.) Larger than the European species. Fur short, gray-brown, tinted red above; tail round, half the length of the body.

*Sorex Indicus*, *Geoff. Ann. Mus. tom. 1. and t. 17. 309.*

Icon. *Geoff. Ann. Mus. tom. 1. pl. 15. f. 1. Buffon. Sup. tom. 7. pl. 71.*

Inhabits India, especially Pondicherry and Tranquebar.

299. 9. *S. Capensis* (Cape Shrew.) Ash-coloured, with

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a tint of yellow ; tail red, round, and half the length of the body.

*Sorex Araneus Maximus*, *Petiver*. *Sorex Capensis*, *Geoff. Ann. Mus. t. 17. 184.*

Icon. *Petiver, t. 23. f. 9. Valentin. Mus. II. 2.*

Inhabits the Cape of Good Hope.

300. 10. *S. Myosurus* (Rat-tailed Shrew.) Entirely white ; tail round, denuded ; muzzle, thick.

*Sorex Myosurus*, *Pallas, Act. Petrop. 1781. tom. II. Musaraigne à queue de Rat, Desmarest, Ency. Méthod. Art. Mammalogie, sp. 242.*

Icon. *Pallas, l. c. pl. 4. f. 1. Geoff. Ann. Mus. t. 17. pl. 3. f. 2 and 3.*

*Obs.* Pallas describes the male of a brown-black, but M. Geoffroy refers his individual to another species ; the female, according to the former naturalist, quite white, which seems to be the result of albinism. The distinction, as a species, therefore, is uncertain.

301. 11. *S. Collaris* (the Collared Shrew.) Black, with a white collar round the neck.

*Sorex Collaris*, *Geoff. Mém. Mus. 1. 309.*

Icon. —

Inhabits the Islands at the mouth of the Meuse.

302. 12. *S. Etruscus* (Tuscan Shrew.) Ashy-gray ; white underneath ; ears round ; large tail, subquadrate.

*Sorex Etruscus*, *Savi, Nuo. Giornal. 1. 60.*

Icon. —

Inhabits Tuscany.

Others have been also named as distinct, as the *S. Murinus* of Gmelin, probably the *S. Indicus* ; the *S. Minimus* of Pallas, the *S. Cæcutiens* of Laxman, the *S. Minutus* or *Pymæus* of the same ; the *S. Exilis*, said to be the smallest

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of quadrupeds, and the *S. Pusillus* of Gmelin, probably a Desman, the distinctive pretensions of which seem very doubtful.

It may be useful to notice here that the *S. Aquaticus* is now arranged in a distinct subdivision, *viz.*, the Scalope; the *S. Cristatus*, in like manner, is now the Condylure; the *S. Brasiliensis*, the *Didelphis Tricolor*, the *S. Auratus*, the *Chrysoclore*, and the *S. Moschatus*, the Desman.

Genus III. MYGALE.

Character of the teeth, according to Geoffroy, from the type of the Desman of the Pyrenees. Incisive teeth  $\frac{3}{4}$ , the two upper large, very strong, conical; lower incisors like those of *Sorex*; false canines or lateral incisors  $\frac{1}{4}$ ; cheek-teeth  $\frac{3}{4}$ , the four posterior above, and the three underneath, bristled with points; nostrils pierced at the end of a flexible sort of proboscis; no conque to the ears; tail long, scaly, and laterally compressed; toes palmated.

303. 1. *Mygale Moscovitica* (the Desman.) Brown above, white underneath.

*Mygale Moscovitica*, *Geoff. Ann. Mus.* xvii. 192. *Mus Aquaticus Exoticus*, *Clusius Exot.* *Castor Moschatus*, L. *Sorex Moschatus*, *Pallas.* *Sorex Moschoviticus*, *Charleton Exot.* *Mus Aquatilis*, *Aldrovandus.* *Glis Moschiferus*, *Klein.*

Desman, *Buffon*, t. 10. Musk Shrew, *Pennant*, *Shaw.* *Icon. Buffon*, t. 10. pl. 2. *Schreber*, tab. 159.

Inhabits Southern Russia.

304. 2. *M. Pyrenaica* (Desman of the Pyrenees.) Brown above, gray underneath; tail longer than the body, cylindrical for the greater part of its length, and laterally compressed toward its extremity.

*Geoff. Ann. Mus.* t. 17. 193.

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Icon. *Geoff. Ann. Mus. pl. 4. f. 1.*

Inhabits the vicinity of Tarbes, at the foot of the Pyrenees.

GENUS IV. TUPAIA.

Incisive teeth  $\frac{3}{3}$ ; canine  $\frac{11}{11}$ ; cheek-teeth  $\frac{11}{11}$ ; body elongate; head triangular, attenuated, blunt; eyes large; ears large; tail very long; teats four, ventral. Diurnal. Inhabits trees.

305. 1. *T. Tana* (the Tupaia Tana.) Head long; muzzle pointed; fur above, reddish-brown, speckled with black beneath, and an oblique red line on each shoulder.

*Tupaia Tanaia Tana*, *Raffles. Lin. Trans.* XIII. 257.

*Tupaia Tana*, *Sumatratresse.*

Icon. *Horsfield, Zool. Java.* No. III. and head and teeth.

Inhabits Sumatra. *Mus. Col. Surg.*

306. 2. *T. Javanica* (the Javanese Tupaia.) Head long; muzzle slightly pointed; tail very long; fur above brown, speckled with gray, with a grayish-white oblique line on the shoulder.

*Tupaia Javanica*, *Raffles. Lin. Trans.* XIII. 267. *Sorex Glis*, *Diard. Asiatic Researches*, x. *Glisorex* Desmarest, *Mam. Sup. Bangsring Javanese.*

Icon. *Horsfield's Java*, No. 3.

Inhabits Java.

307. 3. *T. Ferruginea* (the Ferruginous Tupaia.) Muzzle slightly pointed; fur ferruginous.

*Tupaia Ferruginea*, *Raffles. Lin. Tr.* XIII. 277. *Clodabates Ferruginea*, *F. Cuvier, Mam. Lithog.*

Icon. Head and teeth, *Horsfield's Java*, No. 3.

Inhabits Java.

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### Genus V. SCALOPS.

Upper incisors two, very long and large, followed by three lateral incisors or conical, or canine teeth, leaving a void space between them and the two incisors; cheek-teeth  $\frac{3}{3}$ , with several points; in the lower jaw, are two very small central incisors, with a larger incisor on each side; lower conical teeth increasing successively toward the cheek-teeth; muzzle elongated and cartilaginous; no external ears; anterior toes large, united as far as the third phalanx, armed with long, strong, and flat nails, constructed for digging.

308. 1. *S. Canadensis* (the Canadian Scalops, or Shrew Mole.) Fur gray-brown; eyes hidden within the fur; nose long, terminated by a button-shaped cartilage.

*Sorex Aquaticus*, L. *Talpa Fusca*, Pennant. *Quad.* 314. *Musaraigne Taupe*, Cuv. *Tab. Element des Anim.*

Icon. *Schreber*, *tab.* 158.

Inhabits from Canada to Virginia, in the United States.

### VI. CHRYSOGLORIS.

Incisors  $\frac{4}{4}$  in the upper jaw, strong and sharp, the intermediate lower incisors very small; conical teeth  $\frac{3}{3}$ , small; cheek-teeth  $\frac{4}{4}$ , of the insectivorous character; anterior extremities with only three toes, armed with strong nails, assimilated to those of the Mole; hinder extremities with five toes; eyes very small; external ears wanting; muzzle terminated with a cartilaginous appendage.

309. 1. *C. Capensis* (the Cape Chrysochlore.) Fur brown, but giving, in certain angles of light, a brilliant metallic green and copper colour; hind toes five.

*Chrysochloris Capensis*, *Desm. Ency. Méthod.* 156. *Aspalax*, *Seba.* *Talpa Sibirica Aurea*, *Brisson.* *Talpa Asiatica*, *Gm.*

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Musaraigne Dorée, *Cuvier, Table Element. des Anim. Icon. Seba, Thes. 1. tab. 52. Schreber, tab. 157.*

Inhabits the Cape of Good Hope.

*Obs.* Seba states the habitat of this animal to be Siberia, but it is now known to be an African species.

The Red Mole of Seba, *Thes. t. 52. f. 2.* Gmelin, Pennant, &c., and the Long-tailed Mole of Penn. Arctic Zoology, are thought, by the Baron Cuvier, to be proper to this sub-division; but see his note on the Chrysochlore in the text.

\* \* \* Second Tribe of Insectivorous Mammalia, with several incisors smaller than the canine teeth, like the Quadrumana, &c.

### Genus VII. TALPA.

Incisors  $\frac{3}{3}$ , small and vertical in the upper jaw, forming an arch, and a little inclining in the lower; canine  $\frac{1}{1}$ , triangular; cheek teeth  $\frac{1}{1}$ , the three anterior in the upper, and the two in the lower jaw smaller than the rest; head elongated, terminated with a sort of boutoir; eyes very small; no external ears; pentadactylous; fore feet very large, turned, with the lower edge trenchant; toes united to the nails, which are strong, and slightly arched; hinder feet weak.

310. 1. *T. Europæa* (the Mole.) Glossy cinereous black, like velvet; tail scaly like a rat's; limbs short.

*Talpa Europæa*, L. I. 81. *T. Vulgaris*, *Brisson.*

La Taupe, *Buffon, tom. VIII. Mole, Pen. Brit. Zool. 52. Icon. Buffon, VIII. pl. 12.*

Inhabits nearly all Europe, but not Ireland or Greece.

There are several varieties of the Mole pointed out by naturalists, as the Spotted Mole; *T. Variegata* of Brisson; *T. Maculata* of Klein; the Yellow Mole of Pennant; and the Albinose, or White Mole.

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Genus IX. CENTENES.

Incisors  $\frac{2}{2}$  or  $\frac{3}{3}$ ; canine  $\frac{1}{1}$ , similar to the cheek-teeth  $\frac{4}{4}$ , the first very small, the rest pointed; muzzle pointed; ears scarcely visible; body low, covered with spines, but not capable of being formed into a ball. Toes five; tail none.

311. 1. *C. Semispinosus* (the Tendrac.) Covered with stiff spines on the upper part of the body, with annular varieties of colour; silky hairs on the under parts; four incisors in the lower jaw only. Larger than the Common Hedgehog.

*Erinaceus Ecaudatus*, L. E. *Ecanthurus*, *Boddaert Elem. Anim.* 129. *Setiger Ecaudatus*, *Geoff. Col. du Mus. Tendrac, Buff. tom. XII.* Tenrec, *Cuvier, Table Elementaire des Animaux, et Règne Animal.*

Icon. *Buff.* as above, *pl. 57.*

Inhabits Madagascar.

312. 2. *C. Setosus* (The Tanrec.) Spines long and flexible; six incisors in each jaw. Larger than the preceding.

*Erinaceus Setosus*, L. E. *Tanrec*, *Boddaert, Elem. Anim.* 129. *Tendrac Setiger Inauris*, *Geoff. Coll. du Mus. Cuv. Tab. Elementaire des Animaux, et Règne Animal.*

Icon. *Buffon*, *XII. pl. 56.*

Inhabits Madagascar, and now the Isle of France.

313. 3. *C. Semispinosus* (Radiated Tenrec\*.) Covered with silky hairs and flexible spines intermixed, radiated yellow and black.

*Erinaceus Ecaudatus*, L. E. *Tanrec*, *Boddaert, Elem. Anim.* 129. E. *Semi-spinosus*, *Cuv. Tab. Elementaire des Animaux, et Règne Animal.* *Setiger Variegatus*, *Geoff. Coll. Mus. d'Hist. Nat.*

\* There is some confusion as to the synonymes of these three species.

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Jeune Tanrec, *Buff. Supp. tom. III.* 214. Eteocles Semi-spenosus, *Gray, Med. Repos.* 1821.

Icon. *Buffon, pl. 37. Schreber. t. 165.*

Inhabits Madagascar.

Genus VII. CONDYLURA\*.

Incisor teeth 4, the two intermediate in the upper jaw larger than the rest, which are conical in shape; canine teeth 4; cheek teeth 4; muzzle very long, extremity ciliated; ears, none; external eyes small; feet pentadactylous; nails before famed for digging, those behind weak and small.

314. 1. *C. Cristata* †, (Radiated Condylure.) Nostrils surrounded by a circle of membranaceous processes, radiating from a centre; tail short.

Sorex Cristatus. *Lin. 1. Condylura Cristata, Desmarest, Journal de Physique,* 1819.

Radiated Mole, *Pen. Quad.* 313. Taupe de Canada, *Delafaille, Buff. VI.*

Icon. *Pen. Quad. t. 28. f. 4. Delafaille, Essai sur la Taupe,* 1769. *Buff. II. t. 37.*

Inhabits Canada.

315. 2. *C. Longicaudata*, (Long-tailed Condylure.) No nasal processes; tail half the length of the body.

Talpa Longicaudata, *Erxleb. Sys. Anim. 1. 118. Condylura? Longicaudata, Desmarest, Mam.* 158.

Long-tailed Mole, *Pen. Quad.* 314.

Icon. *Pen. Quad. t. 18. f. 2.*

Inhabits North America.

\* Delafaille's figure erroneously represents the tail as knobbed; from which character, Illiger named the genus *nodulos*, and *obesa* cauda.

† Its insertion in this genus is conditional.

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FAMILY III.—CARNIVORA.

Six incisors in each jaw ; cheek-teeth never furnished with sharp points, as in the family of Insectivora, but either trenchant or tuberculous, or both ; the species more or less carnivorous, in proportion to the trenchant or tuberculous character of these teeth ; canines long and strong.

Tribe I. PLANTIGRADES.

Beasts of prey that bring the whole sole of the foot from toe to heel to the ground in walking.

Genus I. URSUS.

Cheek-teeth proper  $\frac{3}{2}$ , large and entirely tuberculous, with  $\frac{3}{2}$  or  $\frac{2}{2}$  false molars, very small, which come late, and soon fall out ; body thick, and covered with thick hair ; ears largish, slightly acuminate ; toes five, furnished with strong curved claws, fitted for digging ; tail short ; mammæ six, two pectoral and four ventral.

316. 1. *U. Arctos* (Common European Bear.) Brown ; forehead convex above the eyes ; muzzle truncated.

*Ursus Arctos*, L.

Ours, *Buff. tom.* VIII. The Brown or Common Bear of the English.

Icon. *Buff. tom.* VIII. pl. 31. *Perrault*, tab. 9. *F. Cuvier*, *Mam. Lithog. f.* *Baron Cuvier*, *Menag. Mus.*

Inhabits the highest mountains and largest forests of Europe, and the temperate and southern parts of Asia.

317. 2. *U. Niger Europæus* (European Black Bear.) Brownish-black ; nose red ; muzzle reddish yellow brown ; cranium flat.

Black Bear of Europe. *Baron Cuvier*, *Ossemens Fossiles*, IV. 316.

SYNOPSIS OF THE

Icon. —

Inhabits Europe.

*Obs.* There appear to be many varieties of the Common Bear, from white through different shades of brown to black, and such have been frequently treated as distinct.

318. 3. *U. Niger Americanus* (Black Bear of America.) Forehead and nose nearly on one inclined line; fur shining black.

*Ursus Americanus*, *Pallas, Spic. Zool.*

Ours d'Amérique, *Cuv. Menag. du Mus.* Black Bear, *Pen. Quad.* 11.

Icon. *Cuv. l. c.*

Inhabits North America.

*Obs.* The Yellow or Cinnamon Bear of various degrees of intensity, proper to America, are all considered by the Baron as varieties of this species.

319. 4. *U. Maritimus* (Arctic Bear.) Head elongated; skull flat; fur long, soft and white.

*Ursus Maritimus*, *L. Ursus Albus*, *Brisson.*

Ours Blanc, *Buff. Supp. tom.* 111. Polar Bear, *Pennant's Synopsis*, 192.

Icon. *Buff. Supp.* 111. *pl.* 34. *Pennant, Synopsis*, *pl.* 20. *f.* 1. *Pallas, Spic. Zool.* xiv. *f.* 1.

Inhabits the coast of the Polar Sea, principally in America.

320. 5. *U. Candescens* (the Grisly Bear.) Fur long, cinereous gray, very thick, especially about the neck.

*Ursus Ferox*, *Lewis and Clark, Journey to the Missouri. Warden, Description of the United States.* *Ursus Candescens*, *Hamilton Smith.* *Ursus Cinereus*, *Desm. Mam.* 164. *Ursus Horribilis*, *Ord.*

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Grisly Bear, *Lewis and Clark, Journey to the Missouri.*  
Gray Bear, *Hearn's Voyage. Warden's United States.*

Icon. —

Inhabits North America, especially the vicinity of the Missouri.

321. 6. *U. Labiatus* (Long-lipped Bear.) Brown-black, long rough hair; lips long and extensible.

*Bradypus Ursinus*, *Shaw, Gen. Zool. vol. 1. Ursus Labiatus*, *Blainville, Nov. Bull. de la Société Philom. 1817.*  
*Prochilus Ursinus*, *Illiger. Melursus*, *Meyr. Ursus Longirostris*, *Teidman.*

Ursiform Sloth, *Pennant.*

Icon. *Shaw, l. c. pl. 4. Catton's Anim.*

Inhabits the mountainous districts of India.

322. 7. *U. Malayanus* (Malay Bear.) Black, with a large heart-shaped patch of yellowish white on the throat. Fur short and smooth.

*Ursus Malayanus*, *Raffles, Lin. Trans. xii. p. 1. Horsfield's Zool. Java, No. 4.*

Icon. *Horsfield, l. c.*

Inhabits India.

323. 8. *U. Thibetanus* (the Thibet Bear.) Black, under jaw white, pectoral patch forked, and continued to the middle of the belly.

*Ursus Tibethianus*, *Baron Cuvier and F. Cuvier, Mam. Lithog.*

Icon. *F. Cuvier, l. c.*

Inhabits Thibet.

Genus PROCRON.

Canine teeth large and compressed on each side; cheek teeth 48, the three first pointed, the three posterior tuberculous; body slightish; muzzle pointed; ears small; tail

## SYNOPSIS OF THE

long and pointed; standing on the heel of the hinder legs, but walking on the toes; six teats, ventral.

324. 1. *P. Lotor* (the Raccoon.) Fur grayish slate-coloured; muzzle white, with a brown streak across the eyes; tail annulated, dark-slate colour and white.

*Ursus Lotor*, *L.* 1. 70. *Vulpes Americana*, *Charleton*.

Mapach of the *Americans*. Raccoon, *Anglo Americans*, Agouara, Pope d'Azara, *Quad. of Paraguay*.

Icon. *Buffon*, tom. VIII. pl. 43. *Pennant*, II. 2. *Shaw*, 1. 105.

Inhabits South America.

*Obs.* M. Geoffroy has designated two varieties, the Yellow and the Brown-throated Raccoon, and *Buffon* probably another, under the name of *Meles Abba*.

325. 2. *P. Cancrivorus* (Crab Raccoon.) Clear, uniform, cinereous-brown above, yellowish-white underneath; the rings of the tail less distinct than in the other species.

*Ursus Cancrivorus*, *Cuv.* *Règne Anim.* *Procyon Cancrivorus*, *Geoff.*

Raton Crabier, *Buff. Sup.* 6. 236. Chien Crabier, *La-borde*.

Icon. *Buff. Sup.* tom. VI. pl. 32.

Inhabits South America.

## Genus II. *NASUA*.

Teeth similar to those of the preceding sub-genus; body long, thin; nose elongated and moveable; feet semipalmate, armed with strong nails; tail long; teats six, ventral.

326. 1. *N. Rufa* (the Red Coati.) Bright-red; muzzle grayish-black, with three white spots about each eye.

*Nasua rufa*, *Desm. Mam.* 170.

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Quachi Valmont de Bomarre, *Dict. d'Hist. Nat.* Coati Roux, *F. Cuvier, Mam. Lithog.*

Icon. *F. Cuvier, l. c.*

Inhabits South America.

327. 2. *N. Fusca* (the Brown Coati.) Brown or yellowish above, yellowish-gray underneath; three white spots about each eye, as in the preceding species, but with a white streak down the nose in addition.

*Viverra Nascica*, *V. Quasje*, *Gm. i. 64.* *Viverra Rufa*, *Schreb. tab. 118.*

Coati Mondi Marcg. Brasil Coati, *Azara, Anim. de Paraguay.*

Icon. *Perrault, Hist. des Anim. tom. II. pl. 37. Buff. tom. VIII. pl. 47 & 48. Schreb. tab. 118. F. Cuv. Mam. Lithog.*

Inhabits South America.

Genus III. CERCOLEPTES.

POTROS. Illiger. Cheek teeth  $\frac{4}{4}$ , the two first pointed in front, the three posterior tuberculous; body thin; head round; muzzle not elongated; tongue extensible; ears oval; large membranous pentadactylous, toes armed with strong, crooked nails; tail long and prehensile, like that of the Sapajous.

328. 1. *Pottos Caudivolvulus* (the Potto.) Fur silky, bright brownish-yellow.

*Viverra Caudivolvula*, *Schreb. Potot, Buff. sup. tom. III. Yellow Maucoco, Pennant, Quad. Kinkajou, Desm. Mam.*

Icon. *Pennant, Quad. pl. 16. Schreb. tab. 125. Buff. Sup. III. pl. 51.*

Inhabits parts of South America.

Genus IV. MELES.

Cheek-teeth  $\frac{4}{4}$ ; the first very small, the second and

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third pointed, the fourth trenchant on the external side, the fifth tuberculous and large ; the penultimate in the lower jaw the most trenchant of that range. Body thick ; legs low ; muzzle not long ; ears short and round ; eyes small ; tail very short ; a pouch under the tail, containing a fetid secretion.

329. 1. *Meles Vulgaris* (the Common Badger.) Gray-brown above, black underneath ; a longitudinal black band on each side of the head, passing round the eye and ear.

Taxus, or Meles, Ray. *Ursus Meles*, L.

Blaireau Buff. tom. VII. Badger, Pen. *British Zool.*

Icon. Schreb. 142. Buff. Supp. tom. III. pl. 49.

Inhabits Europe.

Obs. The country people pretend to distinguish two varieties, under the names of the Dog-Badger and the Hog-Badger, but they are not authenticated.

330. 2. *M. Labradorica* (American Badger.) Pale yellowish-gray ; belly and throat white, with a longitudinal band on the side of the head, passing above the eye and ear.

*Ursus Labradoricus Gmelin*, *Syst. Nat.* 1102. *Meles Labradorica*, Sabine, *Ross's Voy. App.* 649.

American Badger, Penn. *Quad.* II. 15. Carcajou, Buff. *Supp.* 242.

Icon. Shaw, *Zool.* I. t. 106. Buff. II. f. 49.

Inhabits Hudson's Bay.

## Genus V. GULO.

Cheek teeth 4 ; the three first in the upper, and the four in the lower jaw, small, succeeded by a larger carnivorous or trenchant tooth, and small tuberculous tooth at the back. Body low ; head moderately elongated ; ears short and round ; tail short ; pentadactylous, toes armed with crooked nails.

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331. 1. *Gulo Vulgaris* (the Glutton.) Fur deep brownish-red, darker on the back.

*Ursus Gulo*, *Mustela Gulo*, *Lin. Sys. Nat.* i. 67. *Meles Gulo*, *Boddaert. Gm. Sys. Nat.* i. 104.

Glutton, *Buff. Suppl. tom.* III. 240.

Icon. *Pallas, Spic. Zool.* 14. tab. 2. *Schreb. tab.* 144. *Buff. l. c.*, pl. 48. *Shaw's Zool.* i. t. 104.

Inhabits the coasts of the Arctic Sea.

332. 2. *Gulo Wolverine* (the Wolverine.) Paler than the preceding.

*Ursus Luscus*, *L. Ursus Gulo*, var. *Shaw's Zool.* i. 462. Hudson's Bay Bear of *Brisson*. Quick-hatch, or Wolverine, *Edwards' Birds*.

Icon. *Edwards' Birds*, pl. 108. *Pennant's Quad.* pl. 20. fig. 2. *Shaw's Zool.* i. t. 105.

Inhabits the coasts of the Arctic Sea.

The Baron Cuvier treats the above two as different species; Desmarest merely as varieties.

333. 3. *G. Vittatus* (the Grison.) Black, spotted with white; top of the head and neck gray; white band passing from the forehead to the shoulders; body elongated like the Weasels.

*Viverra Vittata*, *L. Lutra Vittata*, *Wern. Trans.* III. *Fuine de la Guyane et Grison*, *Buff. Sup. tom.* VIII. *Petit Furet*, *Azara, Quad. Paraguay*.

Icon. *Buffon, Sup.* 8. pl. 23 and 25. *F. Cuvier, Mam. Lithog.* *Trail, Wern. Trans.* t. 19. f. 506.

Inhabits South America.

334. 4. *Gulo Barbatus* (Galera or Taira.) Brownish-black, with a white patch covering the under part of the neck and throat; body Weasel formed.

*Mustela Barbara*, *L.*

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*Taira* or *Galera*, *Buff. Supp. t. 7.* The Great Weasel of Azara, *Quad. of Paraguay.* *Galera*, *Brown's Jamaica.* *Cariqueibein*, *Marcgrave*; *la Saricovienne*, *Buff. t. XIII.?*

Icon. *Buff. Supp. tom. VII. pl. 60.* *Brown, Jamaica, pl. 49. f. 1.*

Inhabits parts of South America.

*Obs.* The two last-mentioned species have the cheek teeth  $\frac{3}{3}$ , and may, therefore, be treated as a sub-genus.

II. *RATELLUS.* F. Cuvier. *Cheek teeth*  $\frac{4}{3}$ ; *two false in the upper jaw, and three in the lower.*

335. 1. *G. Ratel* (the Ratel.) Gray above, black underneath, with a longitudinal white line on each side, from the ears to the tail; body thick and heavy.

*Viverra Mellivora*, *Gm. I. 91.* *V. Capensis*, *Gm. 89:*

*Rattel*, *Sparman, Act, Stockholm, 1777.* The Fizzler Weasel, *Pen. Quad.* *Blairau Puant of Laocaille's Travels.* Honey Weasel, *Shaw's Zool. 395.* Cape Weasel, *Id. Zool. 396.* *Hardwick, Lin. Trans. v. IX.?*

Icon. *Schreb. 125.* *Sparman*, as above, *pl. 4. f. 3.*

Inhabits the Cape of Good Hope.

*Obs.* The *Ursus Indicus* of Shaw, Indian Badger of Pennant, are said to be varieties of the Ratel.

The *Atok Gulo Quitensis*, and the *Mapurito* of the Baron Humboldt, have been placed in this sub-genus, on account of their plantigrade motion; but M. Desmarest and other systematic writers, refer these two species to the sub-genus of *Mephitic Weasels*, the species of which may be said to be semi-plantigrade. The *Labrador Glutton*, of Sonini, appears to be a Badger.

336. 2. *G. Orientalis* (the Nyentek of Java.) Glossy reddish brown; white patches about the head and throat; and a long pyramidal white patch from the top of the

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head to the middle of the spine ; rather less than the pole-cat.

*Gulo Orientalis*, *Horsfield's Java*.

Nyentek of the Javanese.

Icon. *Horsfield l. c.*

Inhabits Java.

337. 3. *G. Larvatus* (the Masked Glutton.) Olive-brown and gray, tip of tail and feet black, white patches about the face ; larger than the pole-cat.

*Gulo larvatus*, *Temminck's* and *Hamilton Smith's MSS.*

Icon. nobis.

Inhabits.

338. 4. *G. Ferrugineus* (Ferruginous Glutton.) Chesnut colour, tail black, and feet sepia ; head broad and depressed, eyes near the nostrils, ears far back ; four feet from nose to the end of the tail.

*G. Ferrugineus*, *Hamilton Smith, MSS.*

Icon. nobis.

Habitat. ?

Tribe II. DIGITIGRADES.

Beasts of prey that walk on the toes only.

I. Subdivision of Digitigrades.

With one tubercular tooth behind the great carnivorous tooth in the upper jaw.

Genus *MUSTELA*. Incisors  $\frac{3}{3}$  ; canines  $\frac{11}{11}$  ; cheek teeth  $\frac{33}{33}$ , or  $\frac{44}{44}$  ; head small and oval ; ears short and round ; body long vermiformed ; legs short ; toes five, armed with sharp crooked claws ; no anal pouch, but with a small gland secreting a strong stinking unguent.

I. *PUTORIUS*. Cuvier. *Two false molars above, and three below ; the great carnivorous tooth below without an internal tubercle ; muzzle short ; fetid.*

SYNOPSIS OF THE

339. 1. *P. Vulgaris* (the Polecat.) Fur from the root pale yellow, toward the extremity bright brown; small white spots on the head and muzzle. Length of body one foot five inches; tail six inches.

*Mustela Putorius*, *Lin. Sys. Nat.*

Putois, *Buff. t. VII. Polecat, Pennant's Quad. i. 213.*

Icon. *Schreb. tab. 131. Buff. VII. pl. 24. Ency. Method. t. 82. f. 2. Penn. Brit. Zool.*

Inhabits the temperate parts of Europe.

Var. a. *Furo* (the Ferret.) The fur yellow; eyes red.

*Mustela Furo*, *Lin. Sys. Nat. i.*

Le Furet, *Buff. VII. The Ferret, Penn. Quad. 214.*

Icon. *Schreb. t. 133. Buff. VII. f. 26. Ency. Method. t. 82. f. 2.*

Inhabits Spain and Africa.

*Obs.* It is sometimes variegated with black and brown.

340. 2. *P. Alpinus* (the Alpine Polecat.) The fur sulphur yellow, above brownish; chin white; the canine teeth without any internal tubercle. Length of body and head a foot; tail five inches.

*Mustela Alpina* (vel. *Putorius Alpinus*.) *F. Gebler, Mem. Soc. Imp. des Nat. de Moscou, vi. 213. (1824.)*

Icon. —

Inhabits the Altaica Mountains, near Reddersk.

*Obs.* Shaped like the common Polecat, but smaller, and the head more elongated and acute. The fur is not used in commerce, the hairs being too short.

341. 3. *P. ? Altaica* (the Altaican Weasel.) The tail twice as long as the head, of the same colour.

*Mustela Altaica*, *Pallas Zool. Ross's Ascat. i. 98. F. Gebler, Mem. Nat. Mosc. vi. 213.*

Icon. —

Inhabits Altaica, near Reddersk.

342. 4. *P. Nudipes* (Java Ferret.) Fur brilliant golden yellow; forehead and tip of the tail yellow white; soles of the feet quite naked. Length of the body and head ten inches and a half, tail six inches.

*Mustela Nudipes*, *F. Cuv. Mam. Lithog. N. 32, t. 3.*

Icon. *F. Cuv. Mam. Lithog. N. 32. t. 3.*

Inhabits Java.

343. 5. *P. Sarmatica* (the Perouasca or Sarmatian Weasel.) Fur rich brown, spotted with yellow; throat and belly black.

*Mustela Sarmatica*, *Pallas, Spic. Zool. 14.*

Tiger Iltis, *Pallas, Itiner. j. 175 and 454.* Sarmatian Weasel, *Shaw. Paræiasta, Russians.*

Icon. *Pallas, Spic. Zool. tab. 4. f. 1. Nov. Act. Petrop. xiv. f. 10. Schreber, tab. 132. Ency. Method. t. 82, f. 4.*

Inhabits Poland and Russia Proper.

344. 6. *P. Vulgaris* (the Common Weasel.) Reddish-brown above, white underneath. Length of the body and head six inches; tail an inch and a half.

*M. Vulgaris*, *Lin. Sys. Nat. 1.*

Belette, *Buff. VII. Weasel, Penn. Brit. Zool. 39.*

Icon. *Schreber, tab. 137. A. Buff. VII. pl. 29, f. 1. Pennant's Brit. Zool. fig. Ency. Méthod. t. 84. f. 1. Shaw, Zool. F. Cuv. Mam. Lithog. f. 2.*

Inhabits most of the temperate and the northern parts of the old world, and North America.

Var. a. *Nivalis*. White, with tip of the tail black.

*Mustela Nivalis*, *Lin. Faun. Suec. 7. M. Vulgaris*, *B. Gmelin, Sys. Nat. M. Erminea, B. Bodd.*

Belette des neiges, *Ency.*

Icon. *Ency. Méthod. t. 83. f. 4.*

Var. b.? *Africana*. Body above reddish brown, beneath pale yellow, with a narrow central longitudinal brown band. Length of the body and head ten inches, tail seven.

SYNOPSIS OF THE

*Mustela Africana*, *Desm. Nowv. Dict. Hist. Nat.* xix. 376.

Icon. —

Inhabits Africa.

Obs. M. Desmarest treats this as distinct.

345. 7. *P. Erminea* (the Ermine in Winter, the Stoat in Summer.) Yellow-white beneath, tip of the tail black; back yellow-white in winter, pale chestnut brown in summer. About the size of the Weasel.

*Mustela Erminea*, *Lin. Sys. Nat.* i. *M. Candida*, *Ray. Syn.* *M. Armelina*, *Klein. Quad.*

*In winter*, Ermine, *Pennant. Quad.* L'Hermine, *Buff.* vii.

Icon. —

Inhabits. —

346. 8. *P. Sibirica* (Siberian Weasel.) Pale fulvous, especially on the lower parts; muzzle brown, round the nose white. Same size as the Polecat.

*Mustela Sibirica*, *Pallas, Spic. Zool.* 14.

Chorock, *Sonnini's Buffon*, xxxv. 19.

Icon. *Pallas, Spic. Zool. pl. 4. f. 2.* *Schreber, pl. 135. B.*

Inhabits Siberia.

347. 9. *P. Lutreola* (the Mink.) Blackish brown; upper lip, chin, and under the neck white. Feet semipalmate.

*M. Lutreola*, *Pallas, Spic. Zool.* 14. *Lutra Minor*, *Erxleben, Mém. de Stockholm*, 1739.

Tuhcuri, *Finlanders. Nærs of the Prussians.* Mink of the *Furriers.*

Icon. *Pallas, Spic. Zool. pl. 31.* *Erxleb. Mém. Stock. tab. 11.* *Ency. Méthod. t. 80. f. 1.*

Inhabits Finland very generally, and is found also in all the north-eastern parts of Europe. *Erxleben* refers its habitat also to North America, in which, says *Desmarest*, other similar species are found; but the name *Mink*, as

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used by the Americans, has relation to a species of the Vison.

Var. a. With four longitudinal bands, a spot on each cheek, and the ends of the ears white.

348. 10. *P. Zorilla* (Zorillo.) Fur irregularly variegated with longitudinal black and white bands.

*Viverra Zorilla*, *Gmelin*, *Sys. Nat.* 1.

Blaireau du Cap, *Kolbe*, *Description of the Cape*, 1. 86.

Putois du Cap ou Zoreille, *Buff.* XIII.

Icon. *Buff.* XIII. pl. 41. *Schreber*, tab. 123. *Ency. Méthod.* t. 86. f. 4. *Shaw's Zool.*

Inhabits the Cape of Good Hope.

*Obs.* Buffon and his followers have confounded this species with the American Mephitic Weasels, to which it is much assimilated in appearance.

II. MARTES. *One more false molar in each jaw than in the Putorii, and the lower large carnivorous tooth with a tubercle on the inner side.*

349. 1. *M. Vulgaris* (the Pine Marten.) Brown, with a clear yellow patch under the throat.

*M. Abietinum*, *Ray*, *Syn. Quad.* *Mustela Martes*, *Lin. Sys. Nat.*

La Marte, *Buff.* VII. Pine Martin, *Ray*, *Syn. Quad. Penn. Brit. Zool.*

Icon. *Buffon*, VII. pl. 22. *Schreb.* tab. 130. *Ency. Méthod.* t. 81. f. 4. *Pennant*, *Brit. Zool.* *Shaw*, *Zool.*

Inhabits the northern parts of Europe and Great Britain.

*Obs.* Buffon states, but erroneously, that this species is not British.

350. 2. *M. Foina* (the Fouin or Beech Marten.) Pale brown, with the under part of the throat and neck whitish

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*Mustela Foina*, *Lin. Sys. Nat.*

La Fouine, *Buff. t. vii.* The Marten, *Ray.*

Icon. *Schreb. tab. 129. Buff. vii. pl. 18. Ency. Method. t. 81, f. 1. Shaw. Zool.*

Inhabits Europe and Western Asia.

351. 3. *M. Zibellina* (the Sable.) Fur shining, blackish brown, the head and throat whitish. Feet covered with fur to the ends of the toes.

*Mustela Zibellina*, *Lin. Syst. Nat. Pallas, Spic. Zool. fasc. 14.*

Sable, *Heralds and Furriers.* Sobol, *Russians.* Sabel, *Swedes.* Sable Weasel, *Shaw.*

Icon. *Schreb. tab. 136. Pallas, Spic. Zool. 14. tab. 3. f. 2.*

Inhabits Northern Asia.

352. 4. *M. Vison* (the Vison.) Brown, with the point of the lower jaw white, and the tail brown-black. Length of the head and body fifteen inches.

*Mustela Vison*, *Gm. Syst. Nat.*

Le Vison, *Buff. t. xiii.* Minx of the *Americans?*

Icon. *Buff. xiii. pl. 43. Schreber, tab. 127.*

*Obs.* According to Gmelin and Warden, the feet are semipalmate, but Cuvier says they are not so. It has considerable affinity in colouring and size to *M. Lutreola*; but Cuvier locates the two species in two distinct sub-genera. Desmarest confounds this with the *M. Martes* in his notes.

353. 5. *M. Canadensis* (Pekan.) Head, shoulders, and upper part of the back mixed gray and brown; nose, crupper, tail, and limbs blackish brown; Frequently, but not always, with a white patch on the throat. Length of the body and head eighteen inches, tail ten inches or a foot.

*Mustela Canadensis*, *Gmelin, Syst. Nat.*

Pekan, *Buff. t. xiii.* Pekan Weasel, *Penn. Quad. 331, and 204.*

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Icon. *Buff.* XIII. pl. 42. *Schreb. tab.* 134.

Inhabits Canada and the United States.

354. 6. *M. Pennanti* (the Fisher Weasel.) Fur dark at the base, yellow above, and tipped with black, becoming chestnut instead of yellow on the back; tail black, shining; throat brown, with a few white-tipped hairs; belly and legs dark brown; ears short, lighter at the tips. Length of head and body thirty inches, tail fifteen inches.

*Mustela Pennanti*, *Erzleben, Syst. Mam. sp.* 10. *Mustela Melanorhyncha*, *Bodd. Elench. Anim. sp.* 13.

Fisher Weasel, *Pennant's Quad. No.* 202.

Icon. —

Inhabits North America.

*Obs.* This species, it is said, by Captain *Sabine*, does not feed on fish, but takes its food like the Pine Marten.

355. 7. *M. Rufa* (Chestnut Weasel.) Brownish red colour, deeper above, each hair annulated, brown red, and yellow; tail brown at the extremity.

*Marte Marron*, *Geoff. Collect. du Mus. d'Hist. Nat.* *Mustela Rufa*, *Desm. Mam.* 184.

Icon. —

Habitat unknown.

*Obs.* Probably a variety of the Pekan???

356. 8. *M. Sinuensis* (the Zorra.) Uniform blackish gray; belly and interior of the ears white. Body less vermiformed than in the other species of this subgenus, and more like that of the Kinkajou.

*Mustela Sinuensis*, *Humb. Voy. dans l'Amérique, Mérid. partie Zoologique.* *Marte Zorra*, *Desmarest Ency. Méthod.* sp. 286.

Icon. —?

Inhabits the warm part of New Grenada.

## SYNOPSIS OF THE

357. 9. *M. Leucotis* (White-eared Weasel.) Sepia brown colour; inside of ears white. Twenty inches long.

*Mustela Leucotis*, *Temminck and Hamilton Smith, MSS.*  
Icon. — nobis.

Inhabits.

The *Mustela Cuya* and the *Mustela Quiqui* have also been named by Molina (Chili, 272 and 258), but their specific distinctness seems uncertain, as is also that of the white cheek Weasel of Penn. (*M. Flavigula*, *Bod.* and *M. Quadricolor* of *Shaw* \*.)

III. MEPHITIS. Cuvier. *Cheek teeth*  $\frac{4}{3}$ , two false or small anterior cheek teeth above, and three below; the great carnivorous tooth provided with two tubercles on the inner side, the posterior tooth tuberculous and very long and large. Anterior toes furnished with long digging nails; heel very little raised in walking; the palm and heel hairy.

*Obs.* Following the nomenclature and description of many travellers, zoologists, and systematic describers, there would be nineteen species of the *Mephitis* proper to America to be described, differing principally in colour. The Baron Cuvier (*Ossemens Fossiles, IV.*) inclines, however, to the opinion that all these are but varieties of one species, which varieties, however, are very local, and seem to present a character of permanency.

The following nomenclature, therefore, taken from the Baron's researches and from the *Encyclopédie Méthodique* of Desmarest, treats all the American *Mephites* merely as varieties. The insertion of them, however, here as such,

\* The following species of *Shaw* are referred to other genera:

The *Gray-headed Weasel*, the *Guiana Weasel*, and the *Galeos*; all appear to be varieties of *Gulo Barbatus*; the South American Weasel is the *Gulo Vittatus*; the *Woolly Weasel* (the *M. Guyanensis* of *Lacep.*) is said by Desmarest to be a young *Coati*. The *Musky Weasel* and the *Slender-toed Weasel*, described from drawings, are very obscure.

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must be considered conditional only, as several of them are still thought by able observers to be distinct.

It must be premised, however, that the Zorille of Buffon (*Viverra Zorilla*, Gm.) belongs to the division *Martes*, and that the Coasse of the same writer, at least in the Baron Cuvier's opinion, is established only from an imperfect skin of the Coati.

a. *M. Americana* (American Mephitic Weasel.) Fur soft and shining, marked by white longitudinal bands upon a blackish brown ground ; tail long and furry.

358. 1. *Mustela Americana*, *Desm. Mam.* 186. *Viverra Striata*, *Shaw's Zool.* I. 387. V. *Putorius*, *Gmelin, Syst. Nat.* I. 87. V. *Conepatl*, *Gmelin*, I. 88. V. *Mephitis*, *Gmelin*, I. 88. V. *Chinge*, *Shaw's Zool.* I. 390. V. *Putorius*, *Mutis, Act. Holm.* V. *Marputio*, *Gmelin*, I. 88. *Mephitis Chilensis*, *Geoff.* *Gulo Quitensis*, *Humboldt, Rec. Obs. Zool.* M. *Interupta*, *Raff. Ann. Nat.* 3. *Gulo Marpurito*, *Humboldt, Obs. Zool.* Striated Weasel, *Pennant, Quad.* II. 64. *Conepate*, *Buff.* XIII. 288. *Conepatl*, *Hernand. Mex.* 232. *La Chínche*, *Buff.* XIII. 294. *Skunk, Americans.*

Var. a. *Yagouare* of d'Azara, *Quad. du Paraguay.* Black-brown, brightening with the increased age of the individual, with two white stripes stretching to the tail. Some individuals are without the white stripes ; others have them very obscurely indicated, and others again have the stripes extending along the sides of the tail.

Var. b. *Polecat* of Kalm, *Skunk* of the Americans. Brown-black, with a white stripe down the dorsal line and another on each side of it.

Var. c. The *Zorille* of Gemelli Carreri Voyag. Described only as being black and white, with a very fine tail.

Var. d. The *Mapurita* of Gumilla, *Natural History of the Orenoco*, *Mafutiliqui* of the Indians. Spotted black and white.

Var. e. The *Puant* of Lepage, *Dupratz, Hist. de Ia*

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Louisiane. Male black; female black, bordered with white.

Var. f. The *Orthula* of Mexico, Fernandez, Hist. Nouv. Hisp. Black and white, with yellow in some parts.

Var. g. The *Tepemartla* of the same. Without any yellow; tail annulated black and white.

Var. h. The *Atok* or *Zorra* of Quito, *Gulo Quitensis*, Humboldt. Body marked with two white stripes; tail mixed black and white; tongue aculeated. *Annals of Nature*.

Var. i. The *Ysquepatl* of Hernandez. Marked with several white stripes.

Var. k. The *Polecat* of Catesby's Carolina, tab. 62. Nine white stripes.

Var. l. *Conepate* of Buffon, t. 13. pl. 40. Six white stripes.

The Baron Cuvier thinks that this figure is made up from that of Catesby.

Var. m. The *Conepatl* of Hernandez. Two white stripes on the tail only.

Var. n. The *Mapurito* of Mutis, Act. Holm. 1769, the *Viverra Mapurito* of Gmelin, and *Glouton Mapurito* of Humboldt, Observ. Zool. One white stripe commencing on the forehead, and terminating half down the back. Tail white at its extremity.

Var. o. *Moufette de Chill*, Buff. Sup. t. 7. pl. 57, *M. Chiliensis* Geoff. Dict. des Sciences Nat. pl. 19. fig. 1. Fur brown red, with two white stripes on the sides of the body uniting in the form of a crescent behind the head; tail white and brown.

Var. p. The *Chinche* of Buff. t. 13. pl. 39, *Viverra Mephitis*, Gm. Two white stripes very wide, and large toward their posterior termination; tail with long white hairs, mixed with a few black; forehead with a longitudinal

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white band, joined to that of the back; rest of the body brown, more or less deep, with two small white spots on the shoulders and belly.

Var. q. The *Chinche* of Feuillée, Journal du P. Feuillée, 1714. With two white stripes, terminating on the sides.

Var. r. *Mephitis interrupta*, Rafinesque. Brown, with two short white parallel rays on the head, and eight upon the back, of which four are equal and parallel, and four rectangular, and placed in opposite directions.

Var. s. *Chinga*, Molina. With a band of round white spots on the back.

Var. t. *Mephitic Weasel of Bengal*: Shaw's Gen. Zool. 1st part. Two spots on the head, four white dorsal stripes, and tail furry.

359. 2. *M. Meliceps* (Telagon.). Deep brown, especially on the upper part; forehead marked with a white spot, which is extended into a dorsal line; length of the body and head sixteen inches; tail one inch.

*Mephitis Javanensis*, Desm. Mam. 187. *Myadeus Meliceps*, Horsf. Zool. Resch. vi. Raffles. Telagon, F. Cuvier, Mam. Lithog. 27.

Telagon, Raffles. Lin. Trans. XIII. Telagon, F. Cuv. Mam. Lithog. XXVII.

Icon. Horsf. Zool. Resch. vi., and head. F. Cuvier Mam. Lithog. XXVIII.

Inhabits Java.

Obs. Dr. Horsfield makes a distinct genus of this, under the name *Myadeus*.

III. LUTRA. Ray. Head large, flattish. Ears short. False grinders,  $\frac{3}{3}$ ; the lower great carnivorous tooth, with two points on its outer side; toes webbed, nails crooked. Tail slightly flattened horizontally.

360. 1. *Vulgaris* (the Common Otter.) Brown above;

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whitish underneath; tail more than half as long as the body.

*Lutra Vulgaris*, *Erzleb.* *Mustela Lutra*, *Lin. Sys. Nat.* i. 66.

*La Lutre*, *Buff.* vii. Common Otter, *Shaw. Zool.* 437. Greater Otter, *Pennant, Quad.* ii. 77. Otter, *Penn. Brit. Zool.*

Icon. *Schreb. Saugth. tab.* 126, A. *Buff.* vii. pl. 11. *Pennant, British Zoology.*

Inhabits Europe.

Var. a. *Maculata*, the Spotted Otter, with a great number of little round white spots on the flanks: found near Paris.

361. 2. *L. Brasiliensis* (the Brazilian Otter.)

Brown or yellow, with the throat white or yellowish.

*Lutra Brasiliensis*, *Ray, Syn. Quad. Desm. Mamm.* 188. *Mustela Lutra Brasiliensis*, *Gmelin, Sys. Nat.* *Lutra Brasiliensis*, *Shaw. Zool.* i. 446.

Saricovienne de la Guyane, *Buff. Sup. tom.* vi. Brazilian Otter, *Pennant, Quad.* ii. 79.

Icon. *Ency. Method. Supp. t.* 5. f. 3. *Cuv. Reg. Anim.* iv. t. 4. f. 3.

Inhabits the rivers of both Americas, especially of Guyana.

362. 3. *L. Canadensis*, (Canadian Otter.) Glossy brown; chin and throat dusky white; neck and head long, and the ears closer together than in the *L. Vulgaris*; legs short; tail pointed, and as long as the body.

*Lutra Canadensis*, *Sabine, Franklin, Voy. Ap.* 653. *Mustela Hudsonica*, *Lacépède.*

American Otter, *Sabine. Loutre de Canada, Lacépède.*

Inhabit Copper Mine River.

The Baron Cuvier unites these two varieties, but they are separated by M. F. Cuvier.

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363. 4. *L. Insularis*. (Trinity Otter.) Hairs scattered, polished; body clear chestnut brown; throat and chin yellowish white.

*Lutra Insularis*. *F. Cuv. Dict. Sci. Nat.* xxvii.

Icon.

Inhab. Isle of Trinity.

364. 5. *L. Lataxina* (Carolina Otter.) Hairs long, twisted, wool abundant; above deep brown black; and the cheeks, chin, and throat, pale bluish gray; frontal region of the skull rather concave.

*Lutra Lataxina*, *F. Cuvier, Dict. Sci. Nat.* xxvii.

Icon. —

Inhab. Carolina.

365. 6. *L. Enudris*. Above clear bay, paler beneath; throat and sides of the face nearly white; the curve of the profile of the top of the head slightly but regularly arched, from the occiput to the end of the nose.

*Lutra Enudris*. *F. Cuv. Dict. Sci. Nat.* xxvii.

Icon.

Inhab.

366. 7. *L. Nair* (Pondicherry Otter.) Hair long, deep chestnut; lower part of the neck, throat, and belly, clear reddish white; the cheeks marked under each eye with a reddish brown band.

*Lutra Nair*. *F. Cuv. Dict. Sci. Nat.* xxvii.

Icon.

Inhab. Pondicherry.

367. 8. *L. Inunguis* (Clawless Otter.) Body elevated on its legs; toes large, shortly palmated, clawless; fur soft, chestnut brown, deeper on the buttock, tail, and legs; head and shoulders brownish gray; lips, chin, and lower part of the neck and chest white.

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*Lutra Inunguis*, *F. Cuv. Dict. Sci. Nat.* xxvii.

Icon.

Inhab. Cape of Good Hope.

*Obs.* Deference for the highly respectable zoologist, who has treated these several otters as distinct, obliges us to separate them specifically; otherwise we should have been inclined to say merely, and judging from description alone, that America produces several varieties of the otter.

368. 9. *L. Leptonyx* (Javanese Otter.) Shining fulvous brown; throat dull yellow; tail less than half the body; claws short, blunt, nearly laminar.

*Lutra Leptonyx*, *Horsfield, Java*, vii. *L. Barang. F. Cuv. Dict. Sci. Nat.* xxvii.? *Mustela Lutra*, *Marsden, Sumatra*, 113?

Welingsang, or Wargul, *Javanesse. Angingayer, Malay. Simung, Sumatresse, Raffles. Lin. Trans* xiii. Anzing Ager, *Marsden, Sumatra*, 113. Gryze Otter, *Wurm. Batav. Soc. Trans.* ii. 457.

Icon. *Horsf. Java, t. Marden, Sumatra, t.* 12, 13?

Inhabits Java, Sumatra?

IV. ENHYDRA. Fleming. *Cutting teeth*,  $\frac{4}{2}$ ; *cheek teeth*,  $\frac{14}{3}$ ; *false molares*,  $\frac{2}{3}$ . *Body very long. Hind legs and tail short.*

This subgenus, of Fleming, is intermediate between the otter and the seals, both in the number of its teeth and form of its body and feet. The character of the cutting teeth is from the specimen in the British Museum.

369. 1. *E. Marina* (Sea Otter.) Chestnut brown.

*Mustela Lutris, Lin. Sys. Nat.* i. 66. *Lutra Marina, Erxleb. Enhydra Marina, Fleming, Phil. Zool.*

Sea Otter, *Cook's Voyages. Menzies and Home, Phil. Trans.* 1796. *Lutra Marina, or Sea Otter, Steller. Nov.*

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*Comm. Petrop.* 11. 367. Loutre du Kamtchatka. *Geoff. Col. Mus.*

Icon. *Cook's Voy.* t. 43. *Schreb.* t. 128. *Steller.* l. c. 11. t. 26. *Shaw. Zool.* t. 101. *Ency. Method,* t. 79. f. 3.

Inhab. Bering's Strait and Kamtchatka.

II. SUBDIVISION of the Digtigrades.

With two tubercular teeth behind the great carnivorous tooth in the upper jaw.

Genus CANIS. Lin. Incisors  $\frac{3}{3}$ ; canine  $\frac{1}{1}$ ; cheek-teeth  $\frac{4}{4}$ ; the three first in the upper jaw; and the four in the lower trenchant, but small, and called also false molars. The great carnivorous tooth, above bicuspid, with a small tubercle on the inner side, that below with the posterior lobe altogether tubercular, and two tuberculous teeth behind each of the great carnivorous teeth. Muzzle elongated, (sometimes rather short in the tame varieties;) tongue soft; ears erect, (sometimes pendent in the domestic varieties.) Fore feet pentadactylous; hind feet tetradactylous. Teats both inguinal and ventral.

*Dogs, properly speaking. Pupil of the eyes circular.*

370. 1. *Canis Familiaris* (the Dog.) Tail recurved into an arch; muzzle more or less lengthened. Fur varying in the nature of its hair. Tail generally tipped with white.

*Canis Familiaris, Lyn. Sys. Nat.* 1. 56.

*Canis, Gesner. Quad.* 91.

Le Chein, *Buffon, Hist. Nat.* v. The Dog, *Pennant. Quad. Icon. Lin. Amœn. Acad.* 1v. 43. t. 1. f. 1.

This species is exceedingly subject to vary in the form, colour, and quality of the fur. In arranging the varieties, we have followed the method adopted by M. F. Cuvier.

SECT. I. Head more or less elongated, parietals shelving in an insensible manner towards each other, condyles of

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the lower jaw on the same line with the upper molar teeth.

Var. a. *C. F. Australasica* (the Dingo.) Size and form of the shepherd's dog, with the head resembling that of the Fox. Fur thick, formed of two kinds of hair; the woolly, gray; the silky, yellow or white; upper part of the body, and head and tail deep yellow: lower parts paler; muzzle and inner side of the thighs white; tail with 18 vertebræ.

*C. F. Australasica*, *Desm. Mam.* 191; *Zool.* 277.

Dingo, or Australasian Dog, *Shaw*.

Var. b. *C. F. Sumatrensis*. Countenance of a fox, nose pointed; eyes oblique; ears rounded, very hairy; muzzle foxy brown, much mixed with black; tail pendulous, bushy, reaching nearly to the heel.

*Canis Familiaris Sumatrensis*, *Hardwicke, Lin. Trans.* XIII. 235.

Icon. *Hardwicke, Lin. Trans.* XIII. t. 23. *Shaw, Zool.* I. t. 78.

Inhab. Sumatra.

Very lively, running with its tail extended horizontally, the head high, and the ears straight, courageous and voracious, but very volatile, and scarcely to be rendered tractable.

Var. c. *C. F. Lanarius* (the Mâtin). Head elongated; forehead flat; ears erect at their base, and half drooping; form long and strong without being thick; legs long, nervous, and very strong; tail recurved; hair on the upper part of the body short, and the lower part and tail longer; yellow fox colour, with obliquely disposed parallel interrupted bands on the flanks, sometimes white, gray, brown, or black: length of the body and head thirty-five inches.

*C. F. Lanarius*, *Gmelin, Sys. Nat.*

Mâtin. Buff. v.

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Icon. *Buffon*, v. t. 25. *Ency. Méthod.* t. 103. f. 2.  
*Bewick. Quad.*

Very courageous and intelligent. *Buffon* thinks that this variety, proper to temperate climates, becomes the great Danish dog when transported to the North, and the greyhound when bred in the South. Crossed with the bulldog, the offspring is the mastiff. *C. F. Anglicus* of *F. Cuv.*

Var. d. *C. F. Danicus* (the Great Danish Dog.) Head like that of the *mâtin*; body generally white, marked with numerous small round black spots, but it is sometimes gray, or brown. This variety is remarkable for its acquired attachment to horses.

*C. F. Danicus*, *Desm. Mamm.* 191.

*Danois*, *Buffon*, v. The Dalmatian or Spotted Dog. *Shaw, Zool.* i. 282. The Danish Dog, *Pennant.* Coach Dog.

Icon. *Buffon*, v. t. 26. *Bewick. Quad.*

Var. e. *C. F. Grajus* (the Greyhound.) The greyhound, properly speaking, has several other varieties assimilated to it, all of which form an insulated group distinguished by the elongation of the muzzle beyond all others; the forehead very low, caused by the obliteration of the frontal sinuses, long and slender limbs, general lightness of make, and frequently by the want of the fifth toe, which is developed on the hind feet of the other varieties. To this group belong—

*C. F. Grajus*, *Lin. Sys. Nat.* i. 57.

*Levrier*, *Buffon*, v. The Grey-hound, *Shaw, Zool.* i. 283.

Icon. *Buffon*, v. t. 27. *Ency. Méthod.* t. 98. f. 3. *Bewick. F. Cuv. Mam. Lithog.* xvi.

Sub-var. a. The *Irish Greyhound*, from three to four feet in height; colour white, or cinnamon colour.

Icon. *Lambert, Lin. Trans. Shaw, Zool.* i. t. 77.

*Obs.* Nearly allied, if not identified with *C. Liniarius*.

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Sub-var. b. The *Scotch Greyhound*, large, with the hairs slightly curled and rough; called also the wiry-haired greyhound.

Sub-var. c. The *Russian-Greyhound*. Body very thin, covered with long and thick hair; tail very long and twisted spirally.

Sub-var. d. The *Italian Greyhound*, a diminutive race, with very little hair; white or isabella colour; trembling continually in the low temperature of our climate.

Sub-var. e. *Turkish Greyhound*. Skin naked; suffering like the last from cold.

Buffon, in his hypothetical canine genealogy, deduces this group from the *mâtin* located in the warm climates of this part of the world. The larger greyhounds are used in coursing, but they are destitute of the powers of smell, which distinguish other races, and fit some of them more particularly for the chase.

SECTION II. Head moderately elongated; parietals not approaching each other from their insertion, but rather diverging, so as to enlarge the cerebral cavity and the frontal sinuses.

Var. a. *C. F. Extrarius* (the Spaniel.) Ears large and pendent; tail elevated; fur of different length, in different parts of the body, longer about the ears, under the neck, behind the thighs, and on the tail, than elsewhere; varying in colour, but most commonly white, with brown or black patches. Employed in the chase as a setter, for which it is qualified by its exquisite powers of smell.

*C. F. Extrarius*, *Lyn. Sys. Nat.* 1. 56.

The Spaniel. *English Authors*.

Icon. —

The common spaniel, like the common greyhound, has several analogous breeds, all of which may form a group: of these are—

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Sub-var. a. The *Alpine Spaniel*, very large and beautiful.

Sub-var. b. The *Newfoundland Spaniel*, large, with semi-palmate feet.

Sub-var. c. The *Calabrian Dog*, large, and participating in the distinctions of the Danish dogs and Spaniels from which it springs. Employed in hunting the wolf.

Sub-var. d. The *Little Spaniel*. Head small and round; ears and tail covered with very long hair.

Icon. *Ency. Méthod.* t. 100, f. 3. *Buffon*, v. t. 38, f. 1.

Sub-var. e. The *King Charles Spaniel*, a black variety of the little spaniel.

C. F. Brevipilis, *Gmelin, Syst. Nat. Le Gredin, Buffon*, v.

Icon. *Buffon*, v. t. 19, f. 1.

Sub-var. f. The *Pyrame*, like the preceding, but the black fur relieved with yellow over the eyes on the muzzle, throat, and limbs.

Le *Pyrame*, *Buffon*, v.

Icon. *Buffon*, v. t. 39, f. 2. *Ency. Méthod.* t. 100, f. 2.

Sub-var. g. The *Maltese Dog*, very small; muzzle like that of the little Water Spaniel: fur all over very long and silky; generally white.

*Buffon* conjectures this variety to be the produce of the alliance of the little spaniel and the little water spaniel; the latter also he conceives to be the offspring of the little spaniel and the great water spaniel.

Sub-var. h. The *Lion Dog* differs from the Maltese dog, only in having the hair short on the body and half of the tail; but long on the other parts, particularly the end of the tail, where it forms a tuft.

C. F. Leoninus, *Gmelin, Sys. Nat.*

Le Chien Lion, *Buffon*, v.

Icon. *Buffon*, v. t. 40, f. 2. *Ency. Méthod.* t. 100, f. 5.

*Buffon* attributes the same origin to this as to the preceding, with the genealogical addition of an ancestor with scattered hairs.

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The group of spaniels seem originally to have been located in Spain, whence the name.

Var. b. *C. F. Aquaticus* (the Barbet, or Poodle.) Head large, and round; cerebral cavity larger than in any other variety; frontal sinuses very much developed; ears large and pendent; body thick; tail nearly horizontal; fur long and curly; all over the body generally white, with black patches, or black with white patches.

*C. F. Aquaticus*, *Lin. Sys. Nat.* 1. 57. *Canis Aquaticus Aviarius*, *Gesner*.

Great Water Spaniel, *Shaw, Zool.* 280. Water Dog, *Shaw, Zool.* Grand Barbet, *Buffon, H. N.* v. Caniche, or Chien Canard, *French*.

Icon. *Buffon, H. N.* v. t. 36.

Sub-var. a. The *Little Barbet* is bred, according to *Buffon*, from the great barbet and the little spaniel.

*C. F. Minor*, *Gmelin, S. N.* 1.

Petit Barbet. *Buffon, H. N.* v. Little barbet, or water dog. *Shaw, 1.* 280.

Icon. *Buff.*, *H. N.* v. t. 38. f. 2. *Ency. Méthod.* t. 100. f. 1.

Sub-var. b. The *Griffon* is like the preceding, but the hair is not curled; generally black, with yellow spots over the eyes and on the paws. It appears to have sprung from the barbet and the shepherd's dog.

Le Chien Griffon, *Desm. Mamm.* 193.

Icon.

Var. c. *C. F. Gallicus* (the Harrier?) Muzzle as long, and thicker than that of the *mâtin*; head thick and round; ears large, long, and pendent; limbs strong; tail erect; hair short, or varied with black spots, brown, or yellow, &c.

*C. F. Gallicus*, *Gmelin, S. N.* 1.

Le Chien Courant, *Buffon, H. N.* v.

Icon. *Buffon, V.* t. 32.

Inhabits France.

Peculiar for its fine scent; used in chasing.

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Var. d. *C. F. Avicularius* (the Pointer.) Differs from the preceding only in having the muzzle a little shorter, and not so thick at the end; head thicker; ears shorter, not so large, partly erect, and partly pendent; legs rather longer; and body lighter; and the tail thicker and shorter.

*C. F. Avicularis*, *Lin. Sys. Nat.* 1. 57.

*Canis Pantherinus*, *Aldr. Digit.* 555.

Le Braque, *Buffon, H. N.* v.

Icon. *Buffon, H. N.* v. t. 33. *Ency. Méthod.* t. 103. f. 2.

Sub-var. a. *C. F. Bengalensis* is like the former, but has the colours brighter: it has small black and yellow spots on a white ground.

Le Braque du Bengal. *Buff. H. N.* v.

Icon. *Buffon, H. N.* v. t. 34.

Var. e. *C. F. Vertagus* (the Turnspit.) Head similar to that of the two preceding; ears long and pendent; nose sometimes cleft; tail long; legs short, straight, and thick, generally white, with black and brown patches, or black, with yellow patches.

*C. F. Vertagus*, *Lin. Sys. Nat.* 1. 57.

Le Basset à jambes droites, *Buffon, H. N.* v.

Icon. *Buffon, H. N.* v. t. 35. *Ency. Méthod.* t. 103. f. 3.

Sub-var. a. The *Crooked-legged Turnspit*, has the fore-legs bent outward.

The spaniels and turnspits produce a variety, with elongated body, short legs, and long and silky hair, the *Chien burgos* of Buffon.

Var. f. *C. F. Domesticus* (the Shepherd's Dog.) Head assimilated to that of the *Mâtin*; ears short and erect; tail directed horizontally behind, or curved upward, and sometimes pendent; fur long over all the body, with the exception of the muzzle and outer sides of the limbs; black is the most prevailing colour, oftentimes gray on the throat, chest, and belly, sometimes a yellow spot over the eyes.

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*C. F. Domesticus*, *Lyn. Sys. Nat.*

Chien de Berger, *Buffon*, v. C. de Brie. French Shepherd's Dog. *Shaw*.

Icon. *Buffon*, v. t. 28, *Ency. Méthod.* t. 99, f. 1. *Shaw's Zool.* i. t. 75.

Sub-var. a. The drover's dog, with longer hair more curled, generally of a dingy colour.

Var. g. *C. F. Pomeranus*, (the Wolf Dog.) Ears erect and pointed; head long; muzzle also long and slender; tail high and curled before; fur short on the head, feet, and ears, long and silky over the rest of the body, and particularly the tail; white, gray, black, or yellow.

*C. F. Pomeranus*, *Gmelin*, *S. N.*

Wolf Dog, *Shaw*. Chien Loup. *Buffon*, *His. Nat.* v.

Icon. *Buffon*, v. t. 30. *Ency. Méthod.* t. 99. f. 2.

Var. h. *C. F. Sibiricus*, (Siberian Dog.) Thick hair all over, even on the head and paws; in other respects like the Wolf Dog.

*C. F. Sibiricus*, *Gmelin*; *Sys. Nat.* 1.

Icon. *Ency. Méthod.* t. 99. f. 3.

Var. i. *C. F. Borealis*, (the Esquimaux Dog.) Head similar to that of the wolf dog; tail turned in a circle; ears erect; silky hair, not abundant; woolly hair, on the contrary, excessively thick, very fine and undulated, capable of being plucked off in flocks; colour varied by great patches, irregularly distributed, of white, black, or gray; three black points on each cheek, whence proceed some long hairs.

*C. F. Borealis*, *Desmarest*, *Mam.* 194.

Chien des Esquimaux, *F. Cuv. Mam.*

Icon. *F. Cuv. Mam. Lithog.* t.

Inhabits Baffin's Bay (and perhaps Kamtchatka.)

Var. j. *C. F. Americanus*, (the Alco.) A small head; back arched; tail short and pendent; fur long and yellow on the back, whitish on the tail, according to Fernandes.

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This variety is placed by M. Desmarest in this subdivision, in consequence of the observation of the Baron Humboldt, that it is a variety of the Shepherd's Dog.

C. F. *Americanus*, *Gmelin, Sys. Nat.*

*Michaucanens*, *Fernand. Anim. N. Hisp.* 7. Teshichi, *Fernand. I. c.* 10. Peruvian Dog, or Alco, *Shaw's Zool.* 285.

Inhabits Peru and Mexico.

*Obs.* A specimen similar to Fernandez' description has lately been exhibited in London, as coming from Mexico.

SECTION III. Muzzle more or less truncated, cranium much elevated, frontal sinuses large, condyles of the lower jaw placed above the line of the upper cheek teeth.

Var. a. C.-F. *Molossus* (the Bull-dog.) Muzzle thick, short, and flat; lips thick and pendent; head large, forehead flat, produced by the development of the frontal sinuses elevating the frontal bone above the nose, and reducing the capacity of the brain; ears pendent at their extremity; body thick, strong, and long; fur short; lips, extremity of the muzzle, and outside of the ears black, the rest of the body pale yellow; nostrils frequently cleft.

The black variety of Thibet has the skin excessively loose and plaited.

C. F. *Molossus*, *Lyn. Sys. Nat.*

Le Dogue, *Buffon*, v. The Bull-dog, *Shaw*.

Icon. *Buffon*, v. t. 43. *Ency. Method.* t. 101. f. 3. *Bewick*.

Var. b. C. F. *Anglicus*, (the English Mastiff.) Head assimilated to that of the Bull Dog, but with the ears altogether pendent and never erected; upper lips falling over the lower jaw; end of the tail turned up, frequently having the fifth toe on the hind feet more or less developed. Bred between the Mâtin and the Bull-dog.

C. F. *Anglicus*, *Gmelin, Sys. Nat.*

Chien Dogue de fort Race, *Buffon*, v. The Mastiff, *Shaw*.

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Icon. *Buffon*, v. t. 45. *Ency. Méthod.* t. 101, f. 4.

*F. Cuv. Mem. Lithog.* xviii.

Var. c. *C. F. Fricator*, (the Pug.) The Bull-dog in miniature, with the lip less extensive in thickness, and the tail more curled.

*C. F. Fricator*, *Lyn. Sys. Nat.*

Le Doguin, *Buffon*, v. t. The Pug-dog, *Shaw*.

Var. d. *G. F. Islandicus*, (the Iceland Dog.) Head round; ears partly erect and partly pendent; fur soft and long, especially behind the foreleg and on the tail. Described by Daubenton from a drawing.

*C. F. Islandicus*, *Gmelin, Sys. Nat.*

Le Chien d'Islande, *Buffon, His. Nat.* v.

Icon. *Buffon, His. Nat.* v., t. 31. *Ency. Méthod.* t. 99, f. 4.

Var. e. *C. F. Variegatus*, (the little Danish Dog.) Forehead convex; muzzle thin, pointed; eyes very large; ears half drooping; legs thin; tail recurved; fur thin, spotted with white and black.

*C. F. Variegatus*, *Gmelin, Sys. Nat.*

Le Petit Danois, *Buffon*, v.

Icon. *Buffon*, v. t. 41, f. 1. *Ency. Méthod.* t. 100, f. 6.

*Obs.* When this variety is speckled with black on a white ground, it is called the Harlequin by the French.

Var. f. *C. F. Hybridus*, (the Shock Dog.) Head round; eyes large; ears small, partly erect and partly pendent; tail curved and bent forward; muzzle like that of the pug; fur generally patched black and white.

*C. F. Hybridus*, *Gmelin, S. N.*

Chien Roquet, *Buffon, H. N.*

Icon. *Ency. Méthod.* F. 101, f. 1. *Buffon, H. N. v. F.* 41, f. 2.

*Buffon* attributes this to the little Danish Dog and the pug.

Var. g. *C. F. Britannicus*, (the Black and Tan Terrier) Forehead convex; eyes prominent; muzzle pointed, tail thin, arched horizontally; fur short; ears moderate, half

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erect, deep black, with a yellow spot over the eyes on the muzzle, on the throat and legs.

*Britannicus, Desmarest.*

Icon. —

*Obs.* Desmarest thinks this variety is produced between the little Danish Dog and the Pyrame.

Sub-var. a. The Scotch Terrier, white, with curly stiffish hair.

Var. b. *C. F. Fricator*, (the Artois Dog.) Muzzle excessively short and flat. Produced between the *C. Hybridus* and the Pug.

*C. F. Fricator, β. Gmelin, Sys. Nat.*

*Chien d'Artois, Buffon, v. t. 253.*

*Chien Lillois, Islois, ou quatre vingts of the French.*

Icon. —

Inhabits Flanders.

Var. i. *C. F. Andalusia*, (the Alicant Dog.) With the short muzzle of the *Pug* and the long hair of the *Spaniel*, between which varieties this is produced.

*C. F. Andalusæ, Desm. Mam. 1. 196.*

*Chien d'Alicante, Buffon, v. 254. C. de Cayenne, French.*

Icon. —

Inhabits Alicant.

Var. j. *C. F. Ægyptius*, (the Egyptian Dog.) Head very thick and round; ears erect at the base, large and moveable, and carried horizontally; skin nearly naked, black or dark flesh colour, with large patches of brown.

*C. F. Ægyptius, Gmelin, Sys. Nat.*

*Chien Turc, Buffon, Hist. Nat. Barbary Dog.*

Icon. *Buffon, Hist. Nat. v. t. 42, f. 1. Ency. Method. t. 103, f. 1.*

Inhabits.

Sub-var. a. With a sort of mane behind the head formed of longish stiff hairs.

*C. F. Ægyptius, var. a. Desm. Mam.*

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Chien Turc à crinière, *Buffon, Hist. Nat.* v. .  
Icon. *Buffon, Hist. Nat.* v. t. 42, f. 2.

371. 2. *C. Lupus*, (the Wolf). Head thick and oblong, terminated by a slender muzzle, tail with long hair and pendent; yellowish gray, with a black stripe across the forelegs of the adult; eyes oblique.

*Canis Lupus*, *Lin. Sys. Nat.* 58. *Lupus*, *Gesner, Quad.* 634.  
*Wolf. Penn. Quad.* 4. 248. *Loup*, *Buffon, Hist. Nat.* 7.  
Icon. *Schreb. tab.* 81 & 88. *Buff. pl.* 1. *Ency. Méthod.*  
t. 105, f. 3. t. 104, f. 3, 4. t. 105, f. 1 & 2. *Shaw's Zool.* i. t. 75.  
Inhabits the continent of Europe, and probably North America.

Var. a. *Albida*. Fur white.

*Obs.* Many varieties of this species are mentioned by the American zoologists, and as it seems, like most of the Arctic Mammalia, to vary much in colour, being whiter in high latitudes or in the winter season, not much dependance can be placed on its colour as a specific character.

372. 3. *C. Lycaon*, (Black Wolf). Tail straight; body black, without any white spots.

*Canis Lycaon*, *Gmelin, Sys. Nat.* i. 73.

*Loup Noir*, *Buffon, Hist. Nat.* ix. 362. *Black Wolf*,  
*Shaw's Zool.* i. 297.

Icon. *Buffon, Hist. Nat.* ix. t. 41. *Griffith's Anim. King.*  
Inhabits mountainous parts of Europe.

$\beta$  *Americana*, black, with a white spot on the chest.

*Black Wolf*, *Bartram*.

Inhabits Florida.

The Java Wolf is treated by Desmarest as distinct.

373. 4. *C. Jubatus*, (the Red Wolf.) Uniform brightish red colour, with a short black mane along the spine.

*Canis Jubatus*, *Desmarest, Mam.* i. 198.

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Agouara gouazou, *d'Azara, Quad. du Paraguay.* Loup Rouge, *Cuvier, Reg. Anim.*

Icon. *Cuvier, Regnè Anim. tom. 4. pl. 1. Dict. des Sciences, Nat. v. pl. 17. Ency. Méthod. Sup. t. 6, f. 1.*

*Obs.* Cuvier identifies the *C. Jubatus* with the *C. Mexicanus* of *Gmelin*; but *Desmarest* makes a distinct species of it, which he attributes also to the *Xolsitzaintli* of *Hernandez*, and the *Cuetlachtle*, or *Lupus Indicus* of *Fernandez*.

374. 5. *C. Antarcticus*, (Antarctic Wolf.) Fur reddish; tail at base red, middle black, end white.

*Canis Antarcticus, Shaw's Gen. Zool. i. 331. C. Culpeus Molina.*

Antarctic Fox, *Pennant, Quad. 840. Culpeu, Molina, Hist. Nat. Chili, p. 259. Chili Fox, Shaw, i. 329.*

Icon. *Pennant, Quad. t. 29.*

Inhabits Falkland Islands.

*Obs.* *Desmarest* and *F. Cuvier*, both are inclined to unite the *C. Culpæus*, of *Molina*, and the *C. Antarcticus* of *Shaw*.

375. 6. *C. Cancrivorus*, (the Crab Wolf.) Fur ash-coloured, varied with black above, yellowish white underneath; ears pointed, brown; sides of the neck and behind the ears yellow; the tarse and extremity of the tail blackish; muzzle pointed.

*C. Cancrivorus, Desm. Mam. 199. C. Thous. Gmelin, Sys. Nat.*

Chien des Bois de Cayenne, *Buff. Sup. vii. Koupara, Barrere. Surinam Dog, Pennant, Quad.*

Icon. *Buff. Sup. vii. pl. 38.*

Inhabits Guiana.

376. 7. *C. Aureus*, (the Chacal, or Jackal.) Yellowish gray above, whiter underneath; tail bushy, black at the extremity.

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*Canis Aureus*, *Lin. Sys. Nat.* i. 59. *C. Barbarus*, *Shaw Zool*, t. 311.

*Lupus Aureus*, *Kämpf. Ann. Exot.* 413. Schakal, *Penn. Quad.* 262, and Barbary Schakal, *Pen. Quad.* 260. Jackal and Barbary Jackal, *Shaw*, i. 304 & 311. Le Chackal, *Buff. Sup.* 6, 112. Deab, or Dib, of *Barbary*. Benawi, *Arabs. Nari, Malabar*. Jaqueparel, *Bengal*.

Icon. F. Cuvier, *Mam. Lithog.* II. *Ency. Méthod.* t. 107, f. 3. *Kämpf. Ann. Exot.* t. 407, f. 2. *Buffon, Supp.* VI. t. 16.

Inhabits the warm parts of Africa and Europe, and Southern Asia.

377. 8. *C. Mesomelas*, (the Cape Jackal). Fulvous brown, with a large triangular patch, broad at the shoulders, and terminating in a point near the tail; dotted all over with white specks; flanks red, chest and belly white; tail descending to the ground.

*Canis Mesomelas*, *Gmelin, Sys. Nat.* i. 73.

Cape Schakal, *Pen. Quad.* p. 265. Cape Jackal, *Shaw, Zool.* i. 310.

Icon. *Schreb. tab.* 95. *Griffith, Vest. Anim.* t. *Shaw, Zool.* t. 79. *Ency. Method.* t. 107, f. 4.

Inhabits the Cape of Good Hope.

*Obs.* The Baron we have seen, places this among the Foxes; but the individual whence the drawing here engraved from was taken, was distinguished, as we are assured, by round pupils, and we have therefore placed it, with M. Desmarest, among the Dogs and Wolves, whether as a separate species, or a mere variety of *C. Aureus*.

Baron Cuvier considers the Adive of Buffon (which is copied as the Jackal by Shaw) to be a factitious species, not differing from the *Chacal*; but M. F. Cuvier treats it as having a very great alliance to the *Corsac*.

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378. 9. *C. Anthus* (Senegal Jackal.) Fur gray, sprinkled with yellowish spots; yellowish above, whiter underneath; tail yellow, with a longitudinal black line at its base, and some black hairs at the point.

*Canis Anthus*, *F. Cuvier, Mam. Lithog.*

Chacal du Senegal, *F. Cuvier, Mam. Lithog.*

Icon. *F. Cuvier, Mam. Lithog.* xvii.

Inhabits Senegal.

*Foxes.* Pupils of the eyes long; tail long and bushy.

379. 1. *Vulpes Vulgaris* (the Fox.) Yellow above, white underneath; behind the ears black; tail with long hairs, which are white at its extremity; muzzle pointed; ears erect, acuminate; eyes diagonal.

*Canis Vulpes*, *Syst. Nat.* i. 59.

*Vulpes*, *Gesner. Quad.* 966. The Fox, *Ray. Renard, Buff.* vii. 75.

Icon. *Buffon.* vii. t. 6. *Ency. Method.* t. 106. f. 1. 2.

Var. a. *V. Alopex* has been treated as distinct, but is considered, as we have seen, by the Baron, to be a variety of the Common Fox. It differs in having the fur thicker, and of a deeper red; the additional blackness at the end of the tail, and the blackness of the paws. Found in Alsace and Burgundy.

*C. Alopex*, *Gmelin, Sys. Nat.* i. 74.

Brant Fox, *Shaw. Zool.* i. 321.

*C. Vulpes*, *Desm. Mam.* 202.

Var. b. *Crucigera*, the colour deeper, with a black cruciform mark across the shoulders and down the spine.

*Canis Crucigera*, *Gesner, Quad.* 966.

Cross Fox of *European Naturalists.*

Inhabits the northern parts of the Old and New World.

According to *Linnaeus*, the end of the tail is white; and

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by Desmarest, black; the tip of the tail of the English species is usually white.

380. 2. *C. Cinereo-Argentius* (Tri-coloured Fox.) Upper part of the body gray-black; head yellow-gray; ears and sides of the neck bright-red; throat and cheeks white; under jaw black; belly yellow; tail of the same colour, mixed with black, which prevails exclusively at the end.

*Canis Cinereo-Argentus*, *Gmelin, Sys. Nat.* 1. 74.

Renard Gris, *Brisson, Quad. Der Grisfuch, Schreb. Agouarachy, d'Azara, Quad. du Paraguay.* Fulvous-necked Fox, *Shaw's Zool.* 324.

Icon. *Schreb. tab.* 92. A.

Inhabits the warm and temperate parts of America.

Schreber appears to doubt if it may not be a variety of the *Grey Fox* of Catesby.

381. 3. *C. Argentatus* (Silver Fox.) Black, with some of the hairs tipped with white; extremity of the tail white; forepart of the head and the flanks whitish; sometimes a white spot under the throat; paws covered with short hairs.

*C. Lycaon.* var. *Gmelin. Sys. Nat.* 1. *Canis Argentatus.* *Desm. Mam.* 1. 203.

Renard Noir ou Argenté, *Geoffroy, Collect. du Musé.*  
Renard Argenté, *F. Cuv. Mam. Lithog.*

Icon. *F. Cuvier, Mam. Lithog.* v.

Inhabits America.

*Obs.* Gmelin confounded this with the *Canis Lycaon* or Black Wolf. A similar species is found in Asia, but M. F. Cuvier doubts the identity of the Asiatic and American Black Fox. The American Cross Fox, *C. Decussatus* of Geoff. *Collect. du Mus.*, appears likely to be a mere variety of the *Argentatus*.

382. 4. *C. Lagopus* (Arctic Fox.) Fur very long, thick

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and soft, uniformly brown in summer, white in winter; paws and soles of the feet protected by long hairs.

*Canis Lagopus*, *Lin. Sys. Nat.* i. 59. *Vulpes Cærulescens*, *Lin. Faun. Suec.* 14. t. 13. Isates, *Act. Petrop.* 1760. v. 358. Renard Blue, *Buffon*, XIII. 272.

Icon. *Ency. Méthod.* t. 106. f. 3. t. 107. f. 2. *Bewick, Quad.*

Inhabits the Arctic regions.

383. 5. *C. Corsac* (the Corsac.) Uniform yellow; gray above, lighter underneath; tail very long, touching the ground, and black at the extremity.

*Canis Corsac*, *Gmelin, Sys. Nat.* 1. 74.

*Corsac*, *Guldenstaedt Voyage.* *Isatis, Buffon, Sup.* III. 113, 114. *L'Adive, Buff.* II. ? *Korsaki, Pallas. Neu. Nord. Beytr.* 1. 29. *Corsac Fox, Shaw, Zool.*

Icon. *Buff. Sup.* VI. 17. *Buff.* II. t. cop. *Ency. Méthod.* t. 107. f. 3. *Shaw, Zool.* I. t. 79.

Inhabits the Deserts of Tartary.

*Obs.* This is placed, by the Baron, among the Foxes; by *Desmarest*, it is transferred to the division with circular eye-pupils.

Var. a. *Karagan*. Gray; ears black.

*Canis Karagan*, *Gmelin, Syst. Nat.* I. 74.

*Karagan Fox, Pennant.*

Inhabits Great Tartary.

Most probably a variety of the former.

384. 6. *C. Decussatus* (Cross Fox.) Fur varied, with black-and-whitish above, with a black cross on the shoulders; muzzle, and lower parts of the body and legs black; tip of the tail white.

*Canis Decussatus*, *Geoff. Coll. Mus.—Sabine, Frank. Voy.*

American Cross Fox, *English Furriers.*

SYNOPSIS OF THE

Inhabits North America. (Mus. Brit.)

M. F. Cuvier is inclined to consider it a variety of the *C. Argentatus*.

385. 7. *C. Virginianus* (Gray Fox.) Body entirely silvery gray, with a cast of red about the ears.

*C. Virginianus*, *Gmelin, Syst. Nat.* 1. 74.

Gray Fox, *Catesby, Carolina*, II. 78. Virginian Fox, *Shaw. Zool.* I. 325.

Icon. *Catesby, Carolina*. II. t. 78.

Inhabits warmer parts of North America.

386. 8. *C. Fulvus* (Fulvous Fox.) Fur reddish or fulvous; beneath the neck and belly white; chest gray; front part of the fore legs and feet black, with fulvous toes; top of the tail white.

*Canis Fulvus*, *Desm. Mam.* 1. 303.

Renard de Virginie, *Palisot, Beauv. Bul. Soc. Phil.* Red Fox, *Sabine, Franklin, Voy.* 656.

Icon. *F. Cuv. Mam. Lithog.*

Inhabits North America.

Var. b. *Velong*.

*Canis Velong*. *Say, James, Exped. Rocky Mountains*.

The specimen of this animal, in the British Museum, presented by the Hudson Bay Company, does not well agree with M. F. Cuvier's figure, but better with Desmarest and Say, and Mr. Beauvois' description.

387. 9. *C. Niloticus* (Egyptian Fox.) Body above reddish, beneath gray; behind the ears black; legs fulvous.

*Canis Niloticus aut Ægyptiacus*, *Geoff. Coll. Mus. Par.* *Desm. Mamm.* 204.

Icon. —

Inhabits Egypt.

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The Red Fox of Bartram; the Ceylonese Dog of Pennant, and Shaw, and Vosmaer, and the Bengal, and the Sooty Fox of the same writers, are too doubtful for insertion.

The Dog, the Chacal, and the Fox, are intimately connected, and we could insert several others from drawings with pretensions to a distinct notice, as probable species or permanent varieties.

III. LYCAON. Brooks: *Head short; incisive teeth not forming a regular series, the central one in each jaw being placed more internally than the rest; the body, Hyæna-like, higher before than behind; joints of carpus very weak.*

388. 1. *C. Tricolor* (Burchel's Lycaon.) Ochraeous-yellow, blotched and brindled with black, intermingled with white spots.

*Hyæna! Picta, Temminck, Mem. de Bruxell. Canis Pictus, Desm. Mamm. 1. 538. Lycaon Tricolor, Brook's Mus. Anat. Painted Hyæna, Griffith, Vert. Anim. Loup. Peint. Desm. l. c. Icon. Temminck, l. c. t. Griffith, Vert. Anim. Burchel, Trav. Inhabits Cape of Good Hope.*

The skeleton of this animal agrees exactly with that of the Dog and the Wolf, except in the want of the toe and in the placing of the cutting teeth; the head is also shorter, and, consequently, the teeth closer together; but the formation of the male organ of generation is said to be different from that of the Caninæ, and consequently the mode of copulation different; and it is understood that Mr. Brooks, who possesses a skeleton in his splendid museum, treats it therefore as a genus, under the name Lycaon.

IV. MEGALOTIS. Illiger. *Toes five; ears very large; teeth — ? tail tufted, head long, acute.*

389. 1. *Megalotis Lalandii* (Laland's Fennec.) Gray, the hairs of the dorsal line longer and blacker; tail very tufted, black, gray at its base; feet black.

SYNOPSIS OF THE

*Canis Megalotis*, Cuv. *Ossemens Fossiles, Desm. Mamm.*  
 1. 538. *Megalotes Lalandii*, Hamilton Smith, MSS.  
 Icon. *Nobis*.  
 Inhabit. Cape of Good Hope.

390. 2. *Megalotis Brucei* (Bruce's Fennec.) Dirty-white ;  
 belly whiter ; ears thin, margined with white hairs.

C. Zerda, *Bodd.* *Canis Cerdo*, Gmelin, *Sys. Nat.* 1. 75.  
 C. *Megalotis*. *Fenneccus Brucei*, *Desm. Mam.* 235. *Mega-*  
*lotis*, Illiger.

Animal Anonyme, *Buffon, Sup. Hist. Nat.* VII. 128.  
 (1776.) *Fennec. Bruce*, *Voy.* 1. 154. Zerda? *Sparman,*  
*Voy.* IV. *Pennant, Quad.* 1. 167.

Icon. *Buffon, Supp.* VII. t. 19. *Bruce, Voy.* t. 28. *Spar-*  
*man, Voy.* II. t. 4? *Pennant, Quad.* t. 8. *Shaw, Zool.* t. 80.  
 Inhabits Abyssinia.

VIVERRA. Incisors ƒ ; canines †† ; cheek teeth ††. In the  
 upper jaw, three false molars, a little conical and com-  
 pressed ; a large sharp-cutting carnivorous tooth nearly tri-  
 cuspidous, and two tuberculous teeth ; in the lower jaw there  
 are four false molars, a large carnivorous bicuspidous tooth,  
 and one large tuberculous tooth behind ; head long ; muz-  
 zle pointed ; nostrils pierced on the sides of the nose ;  
 pupils of the eyes capable of contracting themselves almost  
 into a line ; tongue aculeated ; feet pentadactylous ; claws  
 semi-retractile ; anal pouch more or less deep.

I. VIVERRA. Cuv. *Anal pouch very deep, and divided*  
*into two sacks, containing an unctuous, musk-scented secre-*  
*tion ; cheek teeth ††.*

391. 1. *V. Civetta* (the Civet.) Gray, with brown or  
 black stripes and spots ; tail, with four or five annuli,  
 shorter than the body ; a mane along the dorsal line.

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*Viverra Civetta*, *Gmelin, Sys. Nat.* 1. 80.

*Civetta*, *Clusius*.

La Civette, *Buffon, Hist. Nat.* IX. The Civet, *Pennant, Perrault. Hist. des Anim. tab.* 23.

Icon. *Schreb. tab.* 111. *Buff. ix. pl.* 34. *Shaw, Zool.* 1. t. 95. *F. Cuvier, Mam. Lithog.*

Inhabits Africa, especially Abyssinia.

392. 2. *V. Zibetha* (the Zibett.) Gray; legs transversely, spotted with brown; throat white, with two black bands on each side; no mane; tail long, with eight or ten annuli, black and white.

*Viverra Zibetta*, *Gmelin, Sys. Nat.* 1.

Zibet, *Buff. ix. t.* 31. Le Musc, *Lapeyronie, Mem. de l'Academie des Sciences*, 1731. Zibett? *Shaw, Zool.* 1. 389.

Icon. *Schreb. tab.* 112. *Buff. Hist. Nat.* IX. pl. 31. *Ency. Method. t.* 88. f. 2. *Shaw. Zool.* 1. t. 95. *F. Cuvier, Mam. Lithog.*

Inhabits both India and Africa, according to different writers.

393. 3. *Viverra Rasse* (the Rasse.) Yellowish-gray; ears close back, with eight parallel longitudinal blackish lines; neck obscurely banded; feet brown; hair of the body ridged, tail rather attenuated.

*Viverra Rasse, Horsf. Java*, VI.

*Rasse, Javanesse*.

Icon. *Horsf. Java*, VI. t. 2.

Inhabits Java.

Yields the *Dedes* of the Javanese, and the Zibet of the Malays.

II. GENETTA, DESM. *Anal pouch reduced to a mere fold of the skin, containing very little excretion; tail straight; cheek teeth  $\frac{9}{9}$ .*

SYNOPSIS OF THE

394. 1. *Genetta Vulgaris*, (the Genet). Gray, with small round and elongated black spots; tail annulated with black.

*Viverra*, *Genetta*, *Lin. Sys. Nat.* V. *Tigrina*, *Gmelin, Sys. Nat.* V. *Malacensis*, *Gmelin, Sys. Nat.*

*Genette Belon*, *La Genette*, *Buffon, Hist. Nat.* IX. *La Civette de Malacca*, *Sonnerat, Voy. des Indes*, II. *Le Genette du Cap*, *Buff.* VIII. *Chat bizaam*, *Vosmaer*. *Genette de France*, *Buff. Sup.* III. *not the fig.*

Icon. *Shaw, Zool.* I. t. 96. *Schreb. Tab.* 113, *Buff.* VIII. t. 58 and 59, pl. XXXVI. *Sonnerat's Voyage*, pl. 91. *F. Cuv. Mam. Lithog. Cuv. Menag. du Mus. Ency. Method.* t. 88, f. 1 and 3, t. 89, f. 1 and 3.

*Obs.* The above names are applied, by the authors cited, to species as distinct, all of which the Baron refers to the common Genet.

? Var.  $\beta$ . *Pilosello*; *Pennant, Quad.*

Genet Var. ? *Shaw. Zool.* I. 401.

395. 2. *G. Fossa*, (the Fossane.) Fur reddish gray, marked with yellowish brown spots, scattered on the flanks, four longitudinal lines on the back, rings on the tail reddish brown, very obscure.

*Viverra Fossa*, *Gmelin, Sys. Nat.* 91.

*La Fossane*, *Buff.* t. XIII. *Fossane*, *Shaw, Zool.*, p. 402.

*The Fossan*, *Weasel*, *Pennant, Quad.* 75.

Icon. *Buff. Hist. Nat.* III. pl. 20. *Schreb. tab.* 114. *Ency. Method.* t. 89, f. 2. *Shaw, Zool.*, I. t. 96.

Inhabits Madagascar, and, as it is said, both Asia and Africa.

396. 3. *G. Geoffroii* (Geoffroy's Genette.) Fur clear, yellow, marked with brown spots, placed in longitudinal series; end of the nose white; and with a white cross band over the eyes.

*Viverra Fasciata*, *Geoff. MSS. Desm. Mam.* 209, *not Lin.*

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Icon. —

Inhab. —

397. 4. *G. Indica*, (Indian Genet.) Fur yellowish white, with eight longitudinal narrow brown bands.

*Viverra Indica*, *Geoff. Mus. Hist. Nat. Desm. N. Dict. d'Hist. Nat.* VII. 170.

Icon. —

Inhabits India, *Sonnerat*.

*Var.?* Junior? Smaller lines less apparent.

Petite Civette de Java, *Geoff. Mus. Par.*

398. 5. *G. Fasciata*, (Banded Genet.) Fur yellow brown, marked with six brown broad bands.

*Viverra Fasciata*, *Gmelin, Sys. Nat.* 92. V. *Striata*, *Desm. Mam.* 210.

Le Chat Sauvage à bandes noires des Indes, *Sonnerat, Voy.* II. 193. Le Putois rayé des Indes, *Buffon, Hist. Nat. Sup.* VII. Fasciated Weasel, *Shaw, Zool.* I. 405.

Icon. *Sonnerat Voy.* II. t. 90. *Buffon, Sup.* VII. t. 57. *Shaw, Zool.* I. t. 97.

Inhabits Coromandel.

399. 6. *G. Bondar*, (the Bondar.) Fur yellow, hairs tipped with black; dorsal band black, and two narrow parallel bands on each flank; feet and end of the tail black.

*Viverra Bondar*, *Blainville, MSS. Desm. Mam.* 210.

Icon. —

Inhabits Bengal.

*Obs.* Described by *Blainville* from a drawing in the India House.

PROTELES (Isod. Geoff.) *Aspect of the hyæna.* Toes five before and four behind; tail simple.

SYNOPSIS OF THE

400. 1. *Proteles Lalandii* (Lalande's Proteles). Fur gray; small mane; six or seven narrow transverse bands on the flanks, other small bands on the thighs and legs, and end of the tail black.

Viverra? Hyenoides. *G. Cuvier, MSS. Desm. Mam.* 538.  
*Proteles Lalandii, Isad. Geoffroy, Mem. Mus.* 11. 5.

Icon. —

Inhabits Cape of Good Hope.

*Obs.* This interesting animal appears to unite the Hyæna with the Viverra.

VI. MANGUSTA. *Anal pouch very large, with the vent situated at the bottom of it. Cheek-teeth 22; feet pentadactylous.*

401. 1. *M. Ichneumon* (the Ichneumon.) Body dotted equally all over; dirty yellow and slate colour, each hair being annulated alternately with these tints; paws and muzzle black; tail long, and terminated by a diverging tuft.

Viverra Ichneumon, *Lin. Sys. Nat.* p. 84. Herpestes Pharonis, *Desm. Mamm.* 213.

Ichneumon, *Gesner, Quad.* 566. Nems and Pharaoh's rat. *Modern Egyptians, Mangouste, Buffon, XIII.* 150.

Icon. *Schreb. tab.* 116. *Buff. Sup. t. 3. pl.* 26.

*F. Cuvier, Mam. Lithog.—Shaw, Zool.* 1. t. 92.

Inhabits Egypt.

402. 2. *M. Mungos* (the Indian Ichneumon,) similar to the last, but with the tail pointed, and with slightly indicated transverse bands on the body.

V. Ichneumon, B. *Lin. Sys. Nat.* 63. *Mustela Glauca, Lin. Sys. Nat. ed. v. Viverra Mongoz, Gmelin, Sys. Nat.* 184. Herpestes Mungo, *Desm. Mam.* 211.

Mungo, or Mungutia of the Indians.

Icon. *Buff. t. 13. pl.* 19. *A. Kæmpfer Amœnit. Exotic. tab.* 567.

Inhabits India.

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403. 3. *M. Cafra*, (the Caffrarian Ichneumon.) Brownish gray, and uniformly speckled, paws of the same colour, tail pointed.

*Viverra Cafra*, *Gmelin, Sys. Nat.* 85.

*Le Nems*, *Buff. Sup. t.* 3.

*Herpestes Griseus*, *Desmarest, Ency. Méthod.*

*Icon. Buff. l. c. pl.* 27.

Inhabits Southern Africa and India according to M. Geoffroy.

404. 4. *M. Galera*, (the Galera.) Deepish brown, speckled with yellow; tail of equal size, its whole length.

*Mustela Galera*, *Gmelin, Sys. Nat.* i. 95. *Herpestes Galera*. *Desm. Mam.* 212.

*Vansire*, *Buff. t.* 13. *Mangouste Vansire*, *Geoff. Mem. de l'Institut de l'Egypte*. *Vohangshira*, of *Madagascar*. *Galera*, *Shaw*, i. 428. *Madagascar Weasel*, *Pennant*.

*Icon. Buff.* xiii. pl. 21. *Quad.* ii. 51. *Guinea Weasel*, *Pennant*, ii. 53.

Inhabits Madagascar and the Isle of France.

405. 5. *M. Edwardsii* (Edwards' Ichneumon.) Back and tail olive, annulated with brown; muzzle reddish brown; tail pointed.

*Herpestes Edwardsii*, *Geoff. Mem. De l'Egypte, His. Nat.* ii. 138.

Indian Ichneumon? *Edwards' Birds*.

*Icon. Edwards' Birds*, t. 199.

Inhabits East Indies.

406. 6. *M. Javanicus*, (Javanese Ichneumon.) Chestnut brown, spotted with yellowish white; head and legs chestnut; tail equal the whole length.

*Ichneumon Javanicus*, *Geoff. Desc. Egypt*, ii. 138.

*Icon. Horsfield, Zool. Researches*. *Horsfield*, l. c.

Inhab. Java.

SYNOPSIS OF THE

407. 7. *M. Ruber*, (Red Ichneumon.) Fur very bright ferruginous red, especially on the head.

*Ichneumon Ruber*, Geoff. *Mem. Inst. Egypte, His. Nat.* 11. 139.

Icon. —

Inhab. —

408. 8. *M. Major*, (Large Ichneumon.) Chestnut brown, hair chestnut, finely ringed with yellow; tail brown, pointed.

*Ichneumon Major*, Geoff. *Mem. Inst. d'Egypte. His. Nat.* 11. 139.

Icon. —

Inhabits —

VII. *SURICATA*, (Desm.) *Anal pouch very large, with the vent placed at its base & feet tetradactylous; cheek teeth, 44.*

409. 1. *Suricata Capensis*, (the Surikate.) Hairs annulated with brown, white, yellow and black, resulting into a dull brown; nose round; the eyes and ears black; under parts and tail yellowish; nails long, strong and black.

*Viverra Tetradactyla*, Lin. *Viverra Zenick*, Gmelin, *S. N. Suricata capensis*, Desm. *Mem.* 214. *Ryzœna*, Illiger *Prod.*

*Zenick*, *Sonnerat, Voyage to India. Suricate, Buff.* t. 13.

Icon. *Buff. l. c. pl. 7. Schreb. tab. 117. Sonnerat, l. c. pl. 92. Shaw, Zool.—Ency. Méthod. t. 85. f. 4. f. 1.*

Inhabits South Africa.

III. *PARADOXURUS*, (F. Cuvier.) *Anal pouch none, plantigrade, claws half retractile, tail convolute, cheek teeth 44.*

410. 1. *P. Typus*, (Common *Paradoxurus*.) *Body blackish,*

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with some obscure vague longitudinal bands on the flanks; a white spot below the eye; tail black.

*Viverra Nigra*, *Desm. Mam.* 208. *Paradoxurus Typus*, *F. Cuv. Mem. Soc. Phil. May*, 1822. *Viverra Masanga*, *Raffles Trans. Lin. Soc.* xlii., 253.

Genette de France, or Pougouma, *Buffon, Hist. Nat. Sup.* vii. ? Indian Pine Marten, *Pennant?* Musang brilan, *Malay. Lawack, Javanese.*

Icon. *Buffon, Hist. Nat. Sup.* vii. t. 58. *Marsden, Su-matra*, F. ? 212. *Horsfield, Java.*

Inhabits Pondicherry.

411. 2. *P. Prehensilis*, (Prehensile *Paradoxurus*.) Yellow green, with dorsal line the end of the tail, legs, two lines of elongated spots near the back, and many small orbicular spots on each flank, black.

*Viverra Prehensilis*, *Blain. MSS.* *Paradoxurus prehen-silis*, *Desm. Mam. Sup.* 540.

Icon.

Inhab. Bengal.

412. 3. *P. Aureus*, (Golden *Paradoxurus*.) Fur beautiful uniform golden yellow, hair very long.

*Paradoxurus Aureus*, *F. Cuv. Mem. Mus.* v.

Icon.

Inhab. —? *Mus. N. Hist. Paris.*

IV. *ICTERUS*, (*Valenciennes*.) Anal pouch none; plantigrade, claws half retractile, tail convolute, cheek teeth  $\frac{1}{2}$ .

413. 1. *Icterus Albifrons*, (White fronted *Icterus*.) Fur formed of a mixture of long white and black bristles, except

SYNOPSIS OF THE

the head and limbs, where it is short; forehead and muzzle nearly white; tail and legs blackish; a black spot extending from the ear to the side of the nose enclosing the eye.

Viverra? Bentourong, *Raffles, Lin. Trans.* XIII. Paradoxurus Albifrons, *F. Cuv. Mem. Mus.* 540, Icterus Albifrons: *Valenciennes. Ann.*

Bentourong, *Raffles, l. c. Anim. Hist. Nat.* I.

Icon. *Lin. Trans.* XIII. Tab. Valenciennes, *Ann. Sci. Nat.* II. t.—*F. Cuv. Mam. Lithog.—Horsf. Zool. Java, t. F. Cuv. Dents Mam. Teeth.*

Inhabits interior of India.

*Obs.* Varies greatly in colour.

V. PRIONODON, (Horsf.) *Anal pouch none? head elongated; muzzle very pointed; cheek teeth  $\frac{4}{4}$ ; body and limbs slender.*

414. 1. *Prionodon Gracilis* (Slender Delundung.) Fur clear yellow, with four very large transverse brown bands; tail with two very narrow brown bands at its base, and seven broader annuli towards the end, bands and spots on the outer side of the shoulders and thighs.

Viverra? Lesang, *Hardwicke, Trans. Lin. Soc.* XIII. 253. Felis (Prionodonta) gracilis, *Horsf. Zool. Java, I.* Viverra gracilis, *Desm. Mamm.* 539. Prionodon Gracilis, *Horsf. Zool. Java, VII.*

Lesang. *Hardwick. Delundung. Javanese.*

Icon. *Hardw. Lin. Trans.* XIII. t. 24. *Horf. Zool. Java.* I. t. 2.

Inhab. India and Java. *Mus. Brit.* from General Hardwick.

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III. Subdivision of DIGITIGRADES,

Without any tubercular tooth behind the great carnivorous tooth in the lower jaw.

HYÆNA. Incisors  $\frac{3}{4}$  canine  $\frac{1}{2}$ , very strong; cheek teeth  $\frac{4}{5}$ , three conical false molars; one very large, strong, carnivorous tooth, with three cutting edges on the outer side and a small tubercle within, and a little tuberculous tooth behind in the upper jaw; in the lower three false molars, the carnivorous tooth bicuspidous, without an inner tubercle, and no tuberculous tooth behind; jaws powerful, shorter than those of the Dog's but longer than in the Felinæ; tongue aculeated; ears large, tetradactylous; nails not retractile; a glandulous pouch at the anus; teats four.

415. 1. *Hyæna Vulgaris*, (the Striped Hyæna.) Dirty gray, or slate colour, with transverse darker stripes on the flanks and legs; a mane of stiff erect hair down the dorsal line.

*Canis Hyæna*, *Lin. S. N.* *Hyæna vulgaris*, *Desm. Mam.*

Foadh, *Shaw's Travels in Barbary.* Abyssinian Hyæna, *Bruce's Travels.* *Hyæna of the Ancients.*

Icon. *Buff. Sup. pl.* 46. *F. Cuvier, Mam. Lithog. No.* 10. *Pennant, Quad. Kæmph. Ameen. t.* 407, *f.* 4. *Bellon, aquat. t.* 34, *Ency. Méthod. t.* 108, *f.* 1.

Inhabits Barbary, Egypt, Abyssinia, Nubia, Syria, and Persia.

*Obs.* Bruce's *Canis Hyænomelas* does not appear to differ specifically from the common Hyæna, but is probably a larger variety.

416. 2. *Hyæna Crocuta*, (the Spotted Hyæna.) Dingy

whitish gray, yellow with round brown spots on the flanks and thighs; mane like the preceding.

*Canis Crocuta*, Gmelin, S. N. *Hyæna Capensis*, Desm. Mam. 216.

*Hyæna*, Barrow's Cape of Good Hope. Spotted Hyæna. Pen. Quad. Loup Tigre of Kolbe.

Icon. Schreb. pl. 96, B. Pennant, Quad., pl. 17. F. Cuvier, Mam. Lithog. Ency. Method., Supp. t. v. f. A.

Inhabits South Africa.

Var. a. Fur thicker, of a decided gray red colour; under part of the throat and body whitish, with blackish indistinct spots. Cuv. *Ossemens Fossile*, iv. 385.

Obs. There is a specimen in the Museum at Paris described by the Baron Cuvier, *Ossemens Fossiles*, iv. 384; with long hair on the back and flanks, hanging down on each side, of a deep brown colour, with transverse bands on the fore legs and hind feet. The Baron doubts, at present, whether to consider it a variety of *H. Vulgaris*, or a distinct species.

**FELIS.** Incisors  $\frac{2}{3}$ ; canine teeth  $\frac{11}{11}$ ; cheek teeth  $\frac{33}{33}$ , or  $\frac{33}{33}$ ; two false conical and thick in the upper jaw; a large carnivorous tooth, with three lobes and a little tubercle, which is wanting in some of the species; the fourth cheek tooth, in upper jaw, nearly flat, and situated transversely; the two anterior cheek teeth in the lower false; head round; jaws short; tongue aculeated; ears generally short and triangular, in many species with a white spot on the back of them; pupils of the eyes in some circular, in others vertically oval; anterior extremities with five toes, posterior with four; nails retractile.

\* *Large, yellow, spotless Cats.*

417. 1. *F. Leo*, (the Lion.) Yellow, with a tuft at the extremity of the tail. Neck of the male furnished with a long thick mane.

*Felis Leo*, *Lin. and of the Ancients.*

*Le Lion*, *Buff. Hist. Nat. t. 9. Lion of the English.*

Icon. *Schreb. tab. 97, A and B. Buff. l. c. pl. 1 and 2, &c.*

Var. a. Senegal Lion. Fur lighter and brighter. *F. Cuvier. Mam. Lithog.*

Icon. *F. Cuvier, l. c.*

Var. b. South African Lion, with a black mane, and round, thick, bull-dog like head.

Var. c. Asiatic Lion, rather less than the African Lions; mane yellow, and much more scanty.

Inhabits Africa generally, and the southern parts of Asia, though more rarely.

418. 2. *F. Concolor*, (the Puma.) Uniformly yellow, without mane or tuft at the end of the tail.

*Felis Concolor*, *Lin. Tigris fulva, Brisson, Regn. An. 272. Le Cougouar, Buff. Hist. Nat. t. 9. Gouazouara, d'Azara, Anim. des Paraguay. Cougouar, Puma, or American Lion of the English.*

Icon. *Schreb. tab. 104. Buff. l. c. pl. 19, Shaw, Pennant.*

Inhabits the warm and temperate parts of America.

\*\* *Large Cats, with transverse stripes.*

419. 3. *F. Tigris*, (the Tiger.) Yellow above; white underneath; striped on the body with irregular, narrow, black bands; hairs about the cheeks very long.

*Felis Tigris*, *Lin. and of the Ancients.*

*Le Tigre*, *Buff. Hist. Nat. t. 9.*

*Tiger of the English.*

Icon. *Schreb. t. 98. Buff. l. c. pl. 9. F. Cuvier, Mam. Lithog. &c.*

Inhabits Southern and Central Asia.

Var. a. White, with the stripes indicated by a more opaque white.

Icon. *nobis.*

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\*\*\* *Large Cats of the Old World, the body covered with large, irregular patches.*

420. 4. *F. Nebulosa*, (the Clouded Tiger.) Head small; body long, heavy, and cylindrical; legs thick, short, and muscular; tail very thick, long, and annulated; body covered with large, irregular patches, forming enclosures, deeper than the ground colour, but lighter than the edge.

*Felis Nebulosa*, Griffith, *Animal Kingdom*. *Felis Microcelis*, Horsfield, *Zool. Journal*, No. 4.

Tortoiseshell Tiger, Griffith, *l. c.* Remau-daham, *Sumatress*.

Icon. Griffith, *l. c.* and Horsfield, *l. c.*

Inhabits Sumatra, China?

*Obs.* It is not improbable that the individuals here specifically identified, may belong to separate varieties located in Sumatra and China.

\*\*\*\* *Large Cats, with roundish black spots, or clusters.*

421. 5. *Felis Jaguar*, (the Jaguar.) Yellow above, and white about the belly; body marked, with open circles of black, containing a central black dot; the circles disposed in five or six parallel horizontal lines.

*Felis Onça*, Gm. *Tigris Americana*, Bolivar; Yagouarété d'Azara, Quad. of Paraguay; Onza, Marogrove; Panthère femelle, Buff. t. 9.

The Panther of Exhibitors and Furriers.

Icon. D'Azara, *Voyage au Paraguay*, f. F. Cuvier, *Lithog. Geoffroy*, *Ann. Mus.* t. 4. tab. 94.

Inhabits America.

Var. a. Differing from the above in being larger and stouter, the Jaquarété Popé of d'Azara.

Var. b. Brown black, with the spots blacker.

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422. 6. *F. Pardus* (the Panther.) Pale yellow above, with six or seven lines of rose-formed dots, which form clusters of five or six spots on each flank ; tail longer than that of the Jaguar, with the latter part black above, white underneath, having three or four white annuli on the black part\*.

*Felis Pardus*, *Lin.*

*Panthère*, *Cuv. Menag. du Mus.*

*Icon. Cuv. Menag. du Mus. f. Buff. Hist. Nat. t. 9. tab. 11.*

Inhabits Northern Africa.

423. 7. *F. Leopardus* (the Leopard.) Fur bright yellow on the upper part, white underneath, with at least ten ranges of small black clusters of spots on each flank ; lower part of the tail, for about one-third of its length, black above, white underneath, with five or six white annuli on the black part, rather smaller than the Panther.

*Leopard*, *Cuv. Ann. du Mus. t. 14. 148.*

*Icon. Buff. ix. pl. 14. Schreb. pl. 101. Shaw. Zool. Vol. 1. f. 2. pl. 85.*

Inhabits Central Africa, or *Sunda* only, according to the *Baron, Oss. Foss. iv. pl. 426.*

424. 8. *F. Pardus Antiquorum* (Panther of Antiquity.) Spots assimilated to those of the Common Panther, but the ground colour entirely buff yellow ; spotted to end of tail.

\* As Buffon does not distinguish the Jaguar, and has insufficiently characterised the Leopard, it is difficult to distinguish the synonymy with certainty ; but after a minute comparison of the figures, and of the descriptions of Daubenton, I think that his *Panthère mâle*, ix. pl. 11. is our Panther ; that his *Panthère femelle* (*ib. pl. xii. c. Schreb. pl. xcix.* and *Shaw, Gen. Zool. 1. part II. pl. 84.*) is a Jaguar ; and that his *Leopard* (*ib. pl. xiv. c. Schreb. pl. ci.* and *Shaw, pl. 85.*) is in fact our Leopard ; but the character of the tails are ill expressed in these figures. *Cuv. Oss. Fos. t. iv. pl. 425*

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*Felis Pardus Antiquorum*, *Hamilton Smith, MSS.*

Icon. *Nobis.*

Habitat?

*Obs.* The circumstances and peculiarities of these three species have been already noticed, v. 2. 466. at some length. The names Panther and Leopard are sometimes applied by different writers to the two first interchangeably.

425. 9. *F. Jubata* (the Maned Hunting Leopard.) Light yellow, covered with small black round full spots; legs long; a slight mane upon the neck; nails semiretractile.

*Felis Jubata*, *Lin.* *Felis Guttata*, *Herman?*

The Jaguar of *Buff. Sup.* 3. Hunting Leopard, *Pen. Quad.* 1. 284.

Icon. *Schreb. t.* 105. *Buff. Sup.* 3. *pl.* 38. under the name of Jaguar, or Leopard, *Pennant's Quad. t.* 56.

Inhabits Africa.

426. 10. *F. Venatica* (Maneless Hunting Leopard)? Brighter yellow than the last; head smaller, without any appearance of a mane; nails semiretractile; legs longer than the last, and the whole appearance more canine.

Chetah of India?

Icon. *Hamilton Smith's MSS.*

Inhabits India.

427. 11. *F. Uncia* (the Once.) Tail long; body whitish, covered with irregular black simple spots?

*Felis Uncia*, *Gm. Syst. Nat.*

Once, *Buff.*

Icon. *Buff. Nobis.*

Habitat. Persia.

428. 12. *F. Chalybeata* (the Liver-coloured Cat.) Wholly

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grayish liver-colour, with numerous dark brown simple spots; two feet nine inches long, tail darker than the body; annulated, one foot three inches long.

*Felis Chalybeata*, *Hamilton Smith, MSS. from Bullock's Museum.* Not *Chalybeata* of Herman.

Icon. Nobis.

Inhabits Chili.

*Middle-sized Cats, with tail rather long, and generally with Stripes and Spots.*

429. 13. *F. Serval* (the Serval.) Bright fulvous, more or less inclining to gray, and some hues to yellow round the lips; the throat, under part of the body, and inside of the thighs whitish. Spots full, black.

*Felis Serval* and *Capensis*, *Lin.* *Felis Serval*, *Cuv. Oss. Foss.* IV. 433. *Mam. Lithog. No. 1.*

*Chat pard.* *Perrault's Mem. de l'Acad.* III. part 3. t. 13. and *Ib. part* III. t. 3. under the name *Panthère.*

Icon. *Mam. Lithog. No. 1.*

Habitat. Southern Africa.

430. 14. *F. Pardalis* (Ocelot of Linnæus.) Fulvous on the nose, forehead, shoulders, fore-arm, back, rump, and paws; temples ochrey; ground colour of the animal white; on the shoulders and flank four or five long open fulvous spots; rest of the back, rump, and hams, small open spots; tail annulated; tip black; no streak on the forehead.

*Felis Pardalis*, *Linn.*

Ocelot, *Buff. Hist. Nat. t. 13.* Ocelot ♂. or *No. 4, Hamilton Smith, MSS.*

Icon. *Buff. 13. t. 35* and *36.* *Shaw, Gen. Zool. t. 1. f. 88.* Nobis.

Inhabits Mexico.

431. 15. *F. Chibi-gouazou* (the Chibigouazou). Rufous

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on the nose, face, neck, and shoulders; general ground-colour, reddish, with open spots, and patches, bordered with black, with specks within them.

Ocelot  $\alpha$ , or No. 1, *Hamilton Smith, MSS.* F. *Pardalis*, *Lin.* *Felis mites*, *Desm. Mam.* 221.

Chibi-gouazou, *d'Azara Quad. du Paraguay*, 11. 152.  
Mexican Tiger, *Pen.* 1. 288 ?

Icon. Nobis. " "

Habitat. South America.

432. 16. *F. Ocelot*  $\beta$ . (*Ocelot*  $\beta$ . of *Hamilton Smith*.) Like the last, but the spots more numerous, and smaller; large spot on each cheek; no specks within the open patches.

*Felis Ocelot*  $\beta$ , or No. 2, *Hamilton Smith, MSS.*

Icon. Nobis.

Inhabits South America.

133. 17. *F. Ocelot*  $\gamma$ . (*Ocelot*  $\gamma$ . of *Hamilton Smith*.) Ground-colour, ashy mixed, with ochrey, parallel streak from the eye to the ear, with spots within it; tail annulated; tip white.

*Felis Ocelot*  $\gamma$ , or No. 3, *Hamilton Smith, MSS.*

Icon. Nobis.

Inhabits Mexico.

434. 18. *F. Catenata* (the Linked Ocelot.) Ground-colour, reddish yellow; temples ochrey; on the temples, cheeks, throat, belly, and inside of legs white; body marked with long chain-like markings; belly and throat black streaks; tail with imperfect annuli.

*Felis Catenata*, *Hamilton Smith, MSS.*

Icon. Nobis.

Inhabits America.

435. 19. *F. Macrourus* (*Neuwied Cat.*) Ground-colour,

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ochrey gray, streaked with long patches; tail semiannulated, tip black; two streaks from the eye to the jaw; spots on the forehead and cheeks; stands higher than the last-mentioned.

*Felis Macrourus*, Prince Maximilian of Newwied, MSS. and Hamilton Smith, MSS.

Icon. Nobis.

Inhabits Brazil.

436. 20. *F. Chati* (the Chati of F. Cuvier.) Ground-colour brownish-gray; white on the cheeks and under the belly; spots on head and ears as in *F. Chibi-gouazou*; three series of black spots on the neck; spots on the shoulders, formed into an oblique band.

*Felis Wiedii*, Sching's translation of the *Regné Animal?* Chati. *F. Cuvier*, *Mamm. Lithog.* No. 18.

Icon. *F. Cuvier*, *Mamm. Lithog.* No. 18.

Inhabits America.

*Obs.* Desmarest identifies this with *F. Chibi-gouazou*.

437. 21. *F. Colocolo* (the Colocolo of Hamilton Smith.) Head flat and broad; body slender; legs strong; ground-colour whitish-gray; body covered with lengthened streaks of black and tawny; legs from toes to knees dark gray or slate colour.

*Felis Colocolo*, Hamilton Smith, MSS. *F. Colocolo*, Molina?

Icon. Nobis.

Inhabits America.

438. 22. *F. Margay* (the Margay.) Upper part of body yellowish-gray; under part white; four black lines pass from the vertex to the shoulders, and then change into series of long streaks; tail irregularly annulated.

*Felis Tigrina*, Lin.

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Margay, *Buff. Quad.* t. 12.

Icon. *Buffon*, t. xii. 37, *Schreb. tab.* 106.

Inhabits Brazil.

439. 23. *F. Javanensis* (the Kuwuk of Java.) Ground-colour grayish brown; throat, neck, and belly whitish; ears small and distant from the eyes; body slender; four regular series of elongated full spots along the sides, smaller spots towards the belly.

*F. Javanensis*, *Horsfield, Zool. of Java*, No. 1.

Icon. *Horsfield, l. c.*

Inhabits Java.

440. 24. *F. Capensis* (Cape Cat of Forster.) Yellow, with black spots, of different sizes, and bands on the shoulders, back, and fore legs; forehead elevated abruptly from the muzzle.

*Felis Capensis*, *Forster, Phil. Trans.* v. 71. Cape Cat, *Pen. Quad.* 1. 291.

Icon. *Pen. Quad.* 1. pl. 1. *Muller, Cemel. Physica*, t. 39. Nobis.

Inhabits South Africa.

441. 25. *F. Yagouaroundi* (the Yagouaroundi.) Black brown, spotted with pale white.

Yagouaroundi, *d'Azara, Quad. du Paraguay.*

Icon. —

Inhabits South America.

442. 26. *F. Pagers* (the Pagers or Pampa Cat.) Bright gray brown above, with reddish transverse bands on the throat and belly, and dark rings on the paws.

Chat Pampa and Pagers, *d'Azara, Quad. du Paraguay.*

Icon. *Hamilton Smith, MSS.*

Inhabits the continent south of Buenos Ayres.

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443. 27. *F. Eyra* (the Eyra.) Uniformly brightish red; tail more tufted than that of the Domestic Cat; lower jaw and mustachios whitish; and a white spot on each side the nose.

Icon. *Hamilton Smith, MSS. Eyra, d'Azara, Paraguay.*  
Inhabits Paraguay.

444. 28. *F. Nigra* (the Black Cat of America.) Uniformly black.

Chat Nègre of *Azara's; Paraguay.*

Icon. —

Inhabits Paraguay.

445. 29. *F. Undata* (the Waved Cat). Pale gray, with numerous transverse brown or black bands; under part of the body reddish white; lower jaw pure white; inner part of forearm, and humerus, and hind part of the tarsus black; convexity of the ears reddish.

*Felis Undata. Desm. Nov. Dict. de l'Hist. Nat. vi. Young Cuvier, Ossemens Fossiles, iv. 435. adult.*

Chat. Sauvage Indien *Vosmaer, Monog.*

Icon. *Vosmaer, Monog. t. 13.*

Inhabits South Africa. Java?

*Obs. The Felis Obscura of M. F. Cuvier, Dict. des Sciences, Nat. viii. is probably a variety of the above.*

446. 30. *F. Sumatrana* (the Rimau Bulu of the Malays), assimilated to the last, but the spots much more irregular, both in disposition and shape.

*F. Sumatrana, Horsfield, Zool. Java, No. 2.*

Icon. *Horsfield, l. c.*

Inhabits Sumatra.

447. 31. *F. Diardi* (Diard's Java Cat.) Larger than the Kuwuk; ground-colour, yellowish-gray, covered with nu-

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merous full small spots; throat and back with longitudinal bands.

*Felis Diardi*, *Cuvier, Ossemens Fossiles*, 4.

Icon. *Hamilton Smith, MSS.*

Inhabits Java.

448. 32. *F. Nigripes* (the Black-footed Cat.) Tawny, entirely covered with black spots, elongated on the back and neck, under parts of the feet black, tail spotted, not annulated.

*Felis Nigripes*, *Burchell's African Travels, Vol. II.*

Icon. —

Inhabits South Africa.

*Obs.* This may possibly be no other than the booted Lynx of Bruce.

449. 33. *F. Catus Ferox* (the Common Wild Cat). Yellowish gray-brown, with a black dorsal line diverging into four on the neck; sides, flanks, and thighs, covered with obscure transverse bands; tip of the tail black.

*F. Catus*, *Lin.*

Chat Savage, *Buff. Hist. Nat. t. 6. Wild Cat. Pen.*

Icon. *Schreb. t. 107.*

*Habitat.* of the wild variety, the forests of Europe and Asia; of the tame, all the civilized parts of the world.

Var. a. Domestic Cat, differing infinitely in external marks; forehead and cheeks generally preserving a vestige of the stripes proper to the wild variety; intestines rather larger than in the wild variety.

Sub-var. b. Chartreuse Cat (*F. Catus caeruleus*, *Lin. t. 6. pl. 4.*) Fur long and fine, generally of an uniform colour.

Sub-var. c. Spanish Cat (*F. C. Hispanicus* and *F. C. maculatus*, *Bod. t. 6. pl. 3.*) Fur short; feet and lips flesh-colour; the female only, as it is said, spotted with white, bright red, and deep-black patches.

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Sub-var. d. Angora Cat (F. C. Angerousis, *Lin. Buff. t. 6. pl. 5.*) Fur long, soft, and silky; generally white, but sometimes patched; the eyes frequently of different colours.

The New Spain Cat is probably a variety of the common species.

*Lynxes, or middle-sized Cats, with shortish tails, and generally pencilled ears.*

450. 34. *Felis Caracal* (the Caracal.) Uniformly vinous red above, white underneath; tail reaching to the heels; ears strongly pencilled, black on the outside, white within.

Lynx of the Ancients. *Felis Caracal, Lin.*

Caracal à longue queue, *Buff. Sup. III.*

Icon. *Schreb. tab. 110. Buff. t. 9. pl. 24. Sup. III. t. XIV.*

Inhabits the northern parts of Africa, south-eastern parts of Asia, and Bengal.

There appear to be several hereditary, as well as casual varieties of this animal, as the Caracal of Algiers of Bruce, without pencil to the ears, and with longitudinal stripes. The Caracal of Nubia, of the same traveller, with a rounder head, and the ears black on the outside mixed with white; and the Caracal of Bengal, of Edwards, with a longer tail than the ordinary variety.

451. 35. *F. Chaus* (the Booted Lynx.) Uniformly yellowish gray; hind part of the legs black; tail reaching to the heels, annulated with black to its extremity; ears brown without, white within, terminated with a pencil of black hairs.

*Felischaus, Guldenst. Nov. Annum. Petrop. xx. p. 483.*

*Felis Lybicus, Olivier, Voyage en Egypt.*

Booted Lynx, *Bruce, Travels, vol.*

Icon. *Guldenst. as above, pl. 14 and 15. Bruce as above, pl. 30. Olivier, pl. 41.*

Inhabits Abyssinia, Nubia, and the adjoining parts of Asia.

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452. 36. *F. Lynx* (the Lynx.) Reddish-yellow, with small dark brown spots; long pencilled ears, and short tail, black at the extremity.

*Felis Lynx*, *Lin.*

Loup cervier of the French furriers.

Icon. *Schreb. tab.* 109. *Buff. t.* 9. *pl.* 21. *Perrault, Act. des Sc.* III. *p.* 1. *t.* 17.

Inhabits Asia and Africa, and the eastern parts of Europe.

*Obs.* There appear to be at least three varieties in this species, known in Sweden by the names Cat Lynx, Wolf Lynx, and Fox Lynx.

453. 37. *F. Canadensis* (the Canada Lynx.) Covered with fine long hair all over the body, the sides of the face, with longer hair, like the tiger; of a very pale ash colour, with a tint of yellow on the upper parts, whiter underneath.

*Felis Canadensis*, *Geoff.*

Le Lynx du Canada, *Buff. t.* 3.

Icon. *Ib. pl.* 44.

Inhabits Canada.

454. 38. *F. Rufa* (the Red Lynx.) Reddish-yellow, spotted with brown; tail short, white at the extremity.

*Felis Rufa*, *Guldenstaedt.*

Chat cervier of the French furriers.

Icon. *Schreb. tab.* 109. *B.*

Inhabits the United States, but not so far north as the preceding.

M. Rafinesque, in the American Monthly Magazine, has designated as distinct species the following Lynxes:—

*Lynx Fasciatus*, discovered by Lewis and Clarke, and described in their Travels, differing apparently from the Canada Lynx only in being reddish-brown, with blackish

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bands and spots. *Lynx Montanus*, Mountain Cat of the Americans, probably the *Lynx du Mississippi* of *Buff. t. 8*.

Among the more uncertain insufficiently described species may be included :

*F. Manul* of Pallas, *Travels, t. 3*. It seems strongly to resemble the Red Lynx, though it is not spotted. The Mountain Cat of Pennant, which Cuvier refers to the common Lynx. The Tiger Cat of Collinson, *Buff. Sup. t. 3*, which seems to be the Margay. *F. Varia*, of Schreber, which the Baron considers to be a Leopard. *F. Chalybeata*. *Schreber from Herman*. *M. F.* Cuvier refers this to the Serval. *F. Guttata*, of *Herman*, figured by *Schreber*, is stated by *M. F. Cuvier* to be a young Panther.

Barrow speaks of two Cats of the Cape, with numerous black spots on a yellow ground ; one inhabiting the mountains, and the other the plains ; and also of the Cape Leopard, with a mane like a lion, &c.

TRIBE III. AMPHIBIA. Feet short, enveloped in the skin, shaped like fins, and fitted for swimming, those behind horizontal ; cutting teeth variable, mostly  $\frac{4}{4} \frac{4}{4}$ .

### Gen. 1. PHOCA.

Teeth varying greatly in the different species. Incisors,  $\frac{6}{6}$ , or  $\frac{7}{7}$ , or  $\frac{8}{8}$  ; also, varying in form ; canine  $\frac{11}{11}$ , strong conical, slightly curved ; cheek-teeth,  $\frac{7}{7}$  or  $\frac{8}{8}$ , or  $\frac{9}{9}$ , generally similar to the anterior-cheek teeth, or false molars of the carnivora, trenchant, triangular, but more conical and more obtuse ; nose sometimes elongated into a proboscis ; nostrils capable of being completely closed at the will of the animal ; eyes large ; external ears wanting, or merely rudimentary ; pentadactylous, the anterior extremities consisting only of hands, and the posterior only of feet ; fingers enveloped in the skin ; tail short and thick ; teats four, abdominal ; mustachios very strong and numerous.

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Inhabit all the seas, and perhaps Lake Baikal ; live on the sea-shore, and visit the water occasionally, eat fish, mollusca, and algæ.

455. 1. *P. Vitulina* (Common Seal.) Fur yellowish-gray, more or less variegated and spotted with brown, according to its age ; hair abundant ; thick nails, black and strong ; whiskers waved.

*Phoca Vitulina*, *Lin. Sys. Nat.*

Sea Dog. Sea Wolf. Sea Calf, *Pen. Brit. Zool.* Common Seal, *Pennant. Quad. p.* 270. Phoque Commune, *Buffon*, XIII.

Icon. *Pennant, Brit. Zool. Rondelet, Pisc. Marin.* 453. *Buffon*, XIII. t. 45. *Supp. vi. t.* 46. *F. Cuv. Dent. Mam. t.* 38. *Mam. Lithog.* XVI. *Shaw's Zool. 1. t.* 70.

Inhabits the North Sea.

This species is the type of M. F. Cuvier's genus, *Callocephale*.

Var. a. *Bothionica*. Nose larger ; claws longer ; fur deeper.

*Phoca Vitulina Bothionica*, *Lin. Faun. Sue.*

Var. b. *Sebrica*, silvery.

*Phoca Vitulina Sibirica*. *Gmelin. Syst. Nat.*

Inhabits Lakes Oronn and Baikal.

Said by Peron most probably to be an Otter.

Var. c. *Caspica*, variegated with black, yellow, ash-coloured, and white.

*Phoca Vitulina Caspica*. *Gmelin, Syst. Nat.*

Var. d. *Maculata*, adult, spotted ; when young, black above, white beneath.

*Phoca Maculata*, *Bodd.*

456. 2. *P. Leporinus*, (Hare Seal.) Fur yellowish, with a white half collar, forming a cross on the neck ; claws of the fore-feet very strong.

*Phoca leporina*, *Lepechin, Act. Acad. Petrop.*

Phoque commune, *F. Cuv. Mam. Lithog.*

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Icon. *Lepechin*, l. c. t. 8, 9. *F. Cuv. Mam. Lithog.* ix.

Inhabits the North Sea and the White Sea.

*Obs.* According to Desmarest, the cutting teeth of this species are  $\frac{1}{2}$ .

457. 3. *P. Discolor* (Two-coloured Seal.) Fur blackish, marked with torquious yellowish gray lines.

*Calocephale discolor*, *F. Cuv. Mem. Mus.* xi.

Icon. —

Inhabits the North Seas.

458. 4. *P. Lagura* (White-Tailed Seal.) Fur gray, clearer on the sides and belly; back and flanks sometimes variegated with small irregular black spots; whiskers black; tail long, thin, white; claws of the fore-feet long, strong, and compressed.

*Phoca lagura*, *Cuv. Ossemens Fossiles*, v. 206.

Icon. —

Inhab. (Mus. Paris.)

459. 5. *P. Grænländica* (Greenland Seal.) Fur of the adult males whitish, with the forehead and muzzle, and a large subcontiguous lunated blotch on the sides, crossing at the shoulders; claws strong, black; females and young covered with unequal distant angular spots.

*Phoca Grænländica*, *Muller, Pro.* 8. *P. Semilunaris*, *Bodd. P. oceanica*, *Lepechin, Act. Petrop.*

*Svartside*, *Egede*, 46. *Attarsoak*, *Orantz.* 163—169. *Harp Seal*, *Shaw's Zool.*

Icon. *Shaw's Zool.* t. 71. *Egede*, l. c. t. *Lepechin, Act. Petrop.* v. t. 78.

Inhabits the North Sea.

*Lepechin* describes *P. oceanica* as having only  $\frac{1}{2}$  cutting-teeth; but we have followed *M. F. Cuvier* in placing it with *P. Grænländica*.

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460. 6. *P. Fœtida* (Fœtid Seal.) Fur pale brown, variegated with white above, and dirty white beneath; hair rough; claws strong.

*Phoca fœtida*, *Muller, Bod. 8. p. Hispidæ, Schreb. Staught, Halychoerus Griseus, Nilson, His. 1824, 810.*

Phoque nutsoak, *Buffon, Supp. vi. 7. Neitsek, Crantz, 164.*

Icon. *Buffon, Supp. vi. Ency. Méthod. t. 111. f. 2. Crantz. t. 152.*

Inhabits the North Sea.

This species appears to be from the genus *Halychærus* of Nilson.

461. 7. *C. Barbata* (Bearded or Great Seal.) Fur blackish; thumb of the hand shorter than the fingers.

*Phoca Major, Parson's Phil. Trans. XLVII. 121. P. barbata, O. Fab. Grœnland. 18.*

Urksuk, *Crantz. 168. Grand Phoque, Buffon, Hist. N. Supp. vi.*

Icon. *Buffon, Supp. vi. t. 45. Ency. Méthod, t. 3. f. 1. Phil. Trans. XLVII. t. 5.*

Inhabits the North Seas.

*Obs.* Parsons gives a very slight notice of this species, which Buffon identifies with that of Crantz. It is twice the size of the Common Seal; Fabricius identifies his *Barbata* with the Urksuk of Crantz; this species is ten feet long, and is distinguished by the shortness of the thumb.

462. 8. *P. Leptonyx* (Small-clawed Seal.) Claws small, especially those of the hind feet; fur above gray, variegated with yellow; beneath yellowish white; whiskers rigid.

*Phoca Leptonyx, Blainv. MSS. Desm. Mam. 247. Monachus, Flemming, Phil. Zool. iv. 187.*

*F. Cuv. Mem. Mus. iv. 193. Le Phoque à ventre blanc.*

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*Buffon*, *Supp.* vi. Foca a ventre bianco. *Ranzani Men. di Stor. Nat.* i. 102. Cowled or Mediterranean Seal. *Pennant*, *Quad.* vi. 273. Red Seal. *Pennant*, *Quad.* vi. 273. Greek Seal.

Icon. *Buffon*, *Supp.* v. f. 44. *Shaw's Zool.* i. t. 70, 71. *Herman. Oct. Nat. Scut. Bertol.* p. t. 12, 13.

*Inhab.* Adriatic Sea.

Johnstein has published a work on the comparative Anatomy of this Seal. It is the type of M. F. Cuvier's genus *Pelage*.

MIROUNGA\* Gray. Cutting teeth  $\frac{1}{2}$  or  $\frac{2}{3}$ , canine teeth  $\frac{1}{2}$ , cheek teeth short, broad, roots simple; crown striated, nearly flat, external ears none; fur crowned on the nose, elongated into a trunk.

463. 1. *P. Cristatus*, (Crested Sea-Lion.) Top of the forehead furnished with a moveable hood, susceptible of erection, and of covering the eyes and muzzle.

*Phoca cristata*, *Gm. Sys. Nat.* i. *P. Leonina*, *Fab. Faun. Grænl.* *P. Mitrata*, *Camper.*

Klap Migosen. *Egede, Grænländ.* 62? Klap. *Mutz. Egede, Grænländ.* 62? Neitsersoak, *Grænländer*, *Fabricius.*

Icon. *Egede, Grænländ.* 62?

*Inhab.* North Seas, Greenland.

According to Peron several Seals have been confounded with this species. It forms the genus *Stematope* of M. F. Cuvier.

\* The species included in this subgenus are treated by M. Desmarest, *Ency. Méthod.*, as constituting merely a group in the genus *Phoca*, distinguished by the cutaneous appendage to the head, or a sort of trunk to the snout; but as the cheek teeth of all the species appear to be cetaceous, Mr. Gray proposes separating them into a subgenus, which we have adopted.

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464. 2. *M. Proboscidea* (Peron, Sea Elephant, or Proboscis Seal.) Hair very thinly scattered, gray; claws of the fore feet small; the occipital and sagittal ridges very prominent; the mastoid apophysis slightly developed; cutting teeth  $\frac{4}{4}$ .

*Phoca Proboscidea*, *Peron and Leseur, Voyage aux Terres Australes*, vi. 34.

Macrorhine. *F. Cuv. Mem. Mus.* vi. 200. Miouroung, *Native of New Holland*.

*Icon.* Peron and Leseur's Atlas, t. 32. *F. Cuv. Mem. Mus.* vi. t. 3. f. 1. ab. c.

Head. *Desm. Dent. Mam.* t. 39. A. Teeth.

*Ency. Méthod. Sup.* t. 6. f. 4.

Inhabits the Seas of New Holland.

*Obs.* The type of M. F. Cuvier's genus, *Macrorhyna*.

465. 3. *M. Patagonica* (Patagonian Sea-Elephant.) The skull convex, the cerebral cavity more extended, and the nasal region shorter than in the *M. Peronii*; cutting-teeth  $\frac{4}{4}$ .

Phoque des Patagons. *F. Cuv. Mem. Mus.* iv. 203.

*Icon.* *F. Cuv. l. c. t. 14. f. 2.* Skull.

Described by M. F. Cuvier from a skull only of a young specimen.

466. 4. *M. Ansonii* (Anson's Sea-Elephant.) Hair short, clear yellow; feet and tail black; claws of the fore-feet strong. The occipital and sagittal crests slightly developed; the mastoid apophyses not prominent; the cutting-teeth  $\frac{4}{4}$ .

*Phoca Leonina*, *Gmelin, Syst. Nat.* i. 63. *Shaw. Zool.* i. 268. *Phoca Ansonii*, *Desmarest*, 239.

Sea-Lion, *Anson's Voyage*, 122; *Dampier's Voy.* i. 118 ?  
Loup Marine, *Pernetty, Voy. aux Isles Malouines*; *Lion*

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Marine, Phoque a museau ride *Buffon*. Bottle-nosed Seal, *Pennant*, *Quad.* vi. 286.

*Inhab.* Pacific Ocean.

*Obs.* The skull of this species is in the College of Surgeons.

467. 5. *M. Byronii* (Byron's Sea-Elephant.) The occipital and sagittal ridges, and the mastoidal apophyses very prominent; the cutting-teeth  $\frac{3}{4}$ ; the upper ones next the canine, larger than the rest.

*Phoca Byronii*. *Blainville*, *Desm. Mam.* 240.

Sea-Lion. *Byron's Voyage*.

Icon. —

*Inhab.* Island of Tinian.

*Obs.* The skull of this species is also in the College of Surgeons.

The Sea-Lion of Cox's Island of St. Paul, (*Phoca Coxii* *Desm. Nov. Dict. d'Hist. Nat. and Fleurieu Voyage du Capitaine Marchand*, t. 3. 17); the Wolf-Seal, (*Phoca Lupina* of *Melina's Chili*, 260); the long-necked Seal of *Parsons*, *Phil. Trans. Vol. 47. pl. 6*; the speckled Seal of the *Encyclopædia*; the spotted Seal of the same, and the black Seal of the same; the Tiger-Seal of *Krachenninikon*, and the Grumm-selur or King of Seals of *Olassen*; the *Phoca Testudinea* or Tortoise-headed Seal of *Parson's Phil. Trans. Vol. 48*; the Ribbon-Seal of *Pennant*, (*Phoca fasciata*, *Shaw*),—may all be considered as doubtful, and we have therefore merely made a marginal reference to them.

The *Phoca Vitulina*, or Common Seal, *P. Grœnlandica* of *Fabricius*, (*P. Oceanica* of *Lepetchin*); the *P. Leporina* of *Lepetchin*; the *P. Leptonyx* of *Blainville*; the *P. Monachus* of *Herman*; the *P. Cristata* of *Gmelin*; the *P. Ansonii*; and the *P. Lagura* (with the exception, as to this last species of the head and hind-feet),—are the only species of seals,

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properly speaking, whose osteological characters have been examined by the Baron Cuvier.

OTARIA PERON. *Cutting-teeth*  $\frac{4}{4}$ . *canine-teeth*  $\frac{11}{11}$  large; *cheek-teeth*  $\frac{16}{13}$ ; *root simple*; *crown with a principal conical point, and one little conical lobe before and behind it*; *external ears distinct*.

468. 1. *O. Ursina* (Common Sea-Bear.) Fur brown; males maneless. The hind feet furnished with long flaps of skin.

*Phoca Ursina*, *Linn. Gmelin, Syst. Nat.* *Otaria Ursina*, *Desm. Mam.* 249. *Ursus Marinus*, *Steller, Nov. Comm. Petrop.* v. 1751. 331.

*Ours Marin*, *Buff. Suppl.* vi. *Chat Marin*, *Krachenninikon, Hist. du Kamtschatka.*

*Icon. Nov. Com. Petrop.* v. t. 15. *Schreb.* 182. *Buffon*, t. 47.

*Inhab. Kamtschatka.*

The type of M. F. Cuvier's genus, *Arctocephale*.

468. 2. *O. Peronii* (Peron Sea-Bear.) Fur soft, blackish; the hind feet having only three claws apparent in the middle, ending in a five-lobed membrane; bristles of the whiskers round and smooth.

*Phoca pusilla*, *Lyn. Sys. Nat.* *P. Peronii*, *Bodd. Elen.* *Otaria Peronii*, and *O. pusilla*, *Desm. Nov. Dict. Hist. Nat.* xxv. 598 and 602.

*Petit Phoque*, *Buffon*, XIII. *L'Ours Marine du Cap de Bonne Esperance*, *F. Cuv. Dent. Mam.*

*Icon. F. Cuv. Dent. Mam.* t. 39. *Ency. Méthod.* t. III. f. 2. *Buffon*, XIII. t. 53.

*Inhab. Cape of Good Hope.*

469. 3. *O. Coronata* (Crowned Sea-Bear.) Fur black, variegated with yellow spots; with a yellow band on the head, and a spot on the muzzle; the hind-feet with five claws.

*Otaria Coronata*, *Blainville, MSS. Desm. Mam.* 251.

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Icon. —

Inhab. — ? Bullock's Museum.

*Obs.* Like *Phoca fasciata*, Shaw, in colour, but has ears.

470. 4. *O. Cinerea* (Ash-coloured Sea Bear.) Fur ash-coloured, hard, ridged, gray, without any downy fur; ears conical, short.

*Otaria Cinerea*, *Peron and Leseur, Voy. aux Ter. Aust.* VI. 75.

Inhab. Coast of New Holland.

*Obs.* To the obscure description of Peron, we have added the account of the fur and ears, from the skin of the head in the Linnean Society, presented by Capt. P. King, and described by Mr. Gray.

471. 5. *O. Flavescens* (Yellowish Sea-Bear.) Fur uniform pale yellow; fore-feet clawless; the hind-feet with claws; the middle toes longer than the rest; ears long, pointed foliaceous.

*Phoca Flavescens*, *Shaw, Zool.* 260. *Otaria Flavescens*, *Desm. Mam.* 250.

Eared Sealed, *Penn. Quad.* 278.

Icon. *Shaw, Zool.* I. t. 73.

Inhab. Strait of Magellan.—Leverian Museum.

472. 6. *O. Falklandica*, (Falkland Island Seal.) Fur ash-gray, shaded with white; fore feet clawless; hind feet with four claws?

*Phoca Falklandica*, *Shaw, Zool.* 256. *Otaria Falklandica*, *Desm. Mam.* 250.

Falkland Island Seal, *Penn. Quad.* 275.

Icon.

Inhab. Falkland Islands.

*Obs.* There is a specimen in the Museum from New South Shetland, which, as observed by Mr. Gray, agrees with the

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description of this Seal ; but it has five claws on the hind feet ; its ears are long, filiform, and it has downy fur under its hair.

473. 7. *O. Jubata* (Sea-Lion.) Fur yellow ; neck of the male with a large mane ; hind feet, with the ends deeply lobed.

*Phoca Jubata*, *Gmelin, Sys. Nat.* i. 63. *Otaria Jubata*, *Desm. Mam.* i. 248. *Leo marinus*, *Steller, Nov. Gom. Act. Petrop.* v. 418.

Leonine Seal, *Pennant. Quad.* v. 288. Sea-Lion, *Forster, Cook's Second Voyage*, iv. 54. Lion Marine, *Buffon, Supp.* vi. t. 418.

Icon. *Perrette's Voyage, aux iles Malouines*, vi. t. 10. *Forster, Voyage*, t. *Buffon, Supp.* vi. t. 48. *Ency. Méthod.* t. 109. f. 3. *Shaw, Zool.* t. 174.

Inhab. Pacific Ocean, Coast of Patagonia. *Forster. Bering's Strait. Steller.*

This species is the type of *M. F. Cuvier's* genus *Platyrrhinque*.

The *Otaria Albicollis* of Peron and Leseur, ii. 118 ; and the *P. Porcina* of Molina, an eared species, if distinct, have not yet been examined with sufficient accuracy to fix their osteological characters.

## Genus II. TRICHECHUS.

Cutting-teeth  $\frac{3}{3}$  ; small deciduous canine teeth  $\frac{1}{1}$ , very large, longer than the head, oval, laterally compressed, arched, blunt ; cheek-teeth  $\frac{2}{2}$ , small, cylindrical, crown oblique, truncated ; body long, conical ; head round ; muzzle large ; external ears none, tail short ; fore-feet paddle-shaped, armed with five short claws ; hind feet horizontal ; toes, five, united in the skin.

474. 1. *T. Rosmarus* (Sea-Elephant.), Lips very thick ; bristles ridged, strong ; fur thin, short, reddish.

*T. Trichechus Rosmaris*, *Lin. Sys. Nat.* i. 49. Manati

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Trichechus, *Bodd. Elen. Anim.* 173. Rosmarus, *Scopill.*  
 Odobenus, *Lin. Sys. Nat. ed.* 10. 38. *Brisson.* Rosma-  
 rus, *Jonston, Pisc. t.* 44. Equus Manuus, *Rai, Quad.* 191.  
 Mors. Morfo. Rosmarus, *Gesner, Aquat.* 211.

Wallruss, *Marten, Spits. b.* 78. Le Morse, *Buffon, Hist.*  
*Nat.* XIII. Sea Elephant. Arctic Wallrus, *Shaw's Zool.*

Icon. *Hout. Nat. v. t.* 11. f. 1. *Schreb. v. t.* 79. *Jon-*  
*ston, Pisc. t.* 4. IX. *Lev. Mus. t.* 23. f. 3. *Bonanu. Mus.*  
*f.* 27. *Gesner, Aquat.* 211. *Ellis, Hudson, t.* 6. f. 3.  
*Marten, Spits. t.* 1. f. 13. *Buffon, Hist. Nat.* XIII. t. 54.  
*Ency. Méthod. t.* 112. f. 1. *Cook's Third Voyage, IV. t.* 8.  
*Shaw's Zool. t.* 78.

Inhab. Northern Ocean.

The two species proposed by Dr. Shaw, appear to be  
 only varieties.

FAMILY IV.—MARSUPIATA.

TEETH varying very considerably in the different subdivi-  
 sions; all the species born prematurely, at least in a very  
 early stage of development, and become attached to the  
 mammæ of the mother, in a manner not known. The  
 mammæ and young of most of the species enclosed  
 within an external pouch, or second womb; the pouch  
 supported by two marsupial bones; thumb of the hind  
 extremities mostly distinct and opposable to the fingers,  
 in a few species wanting.

Inhabiting South America, New Holland, and the Indian  
 Islands?

Sub-Division I., with Canine and insectivorous Cheek-teeth.

Gen. I.—DIDELPHIS.

Incisors  $1^0$ ; the two intermediate in the upper jaw  
 longer than the rest, and separated from them; in the  
 lower jaw they are very small and equal. Canine 11,  
 strong, compressed, and a little projected outward. Cheek-

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teeth 17, or 14; the three first in the upper jaw, false teeth, being very small and triangular, the remainder insectivorous, or furnished with sharp points; the four first in the lower jaw, also false and small, and the three others furnished with points. Head long and conical, and muzzle pointed; ears large, rounded, and almost naked; tongue aculeated. Locomotion plantigrade; pentadactylous, nails long and bent; thumbs of the hind feet long, opposable to the fingers, and destitute of nail; tail long, half hairy, and scaly, hair hard, close; stomach simple in all.

Inhabiting South America.

\*Female with a Pouch.

475. 1. *D. Virginiana* (Virginian Opossum.) Fur silky, mixed black and white bars, partly black and partly white; head nearly white; size of a Rabbit.

*Didelphis Virginiana*, Pennant, *Quad.* 11. *pa.* 18.

Sariguesa Oreilles Bicoleres, *Cuv. Rég. Anim.* Sarigue des Illinois, *Buff. Sup.* vi. S. a long poil, *Buff. Sup.* vi. Micouré premier Manicou, *Bonn. Ency.* Opossum, *Americains*, d'Azara, *Quäd. du Paraguay.* Virginian Opossum, *Shaw, Zool.* vol. I.

*Icon.* *Buff. Sup.* vi. *f.* 35. *t.* 34. *Ency. Méthod.* t. 264, *Sup.* t. 7. *f.* 1. *Bonn. Ency.* t. 24. *f.* 6. *Shaw, Zool.* i. t. 107. *Phil. Trans. Abridg.* vi. t. 13. *Mus. Lever.* t. 6.

Inhabits most of the hot and temperate parts of America.

476. 2. *D. Azarae* (Azara's Opossum.) Fur of two sorts, one cottony underneath, white at the base, and black at the tip; the other long, stiff, and white; black round the eyes; all the legs black; first half of the tail hairy, the rest scaly. Total length about thirty inches, of which the tail is fourteen.

*Didelphis Azaræ*, *Temminck, Monographie de Mammalogie*, *pa.* 30.

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Micouré premier, *d'Azara, Quad. du Paraguay.*

Icon. —

Inhabits South America.

477. 3. *D. Cancrivora* (the Cayenne, or Crab-eating Opossum.) Yellowish, mixed with white; a brown line upon the forehead.

*D. Marsupialis, Lin. Sys. Nat. i. 71. D. Cancrivora, Gm. Sys. Nat. Philander maximus orientalis, Seba.*

Crabier, (the male) *Buff. Sup. vii. D. Carcinophaga, (the female) Bodd. Molucca Opossum, Shaw.*

Icon. *Buff. Sup. vii. pl. 54. Seba. Thes. v. 1. 38.*

Inhabits Cayenne and Surinam.

478. 4. *D. Quica* (Quica Opossum.) Tail longer than the body and head, nearly half hairy, and white; above blackish-yellow, with a silvery hue; upper part of the head blackish, with three white bands; chin white; belly reddish; size of a Pole Cat.

*Didelphis Quica, Temminck, Monog. pa. 36. Quica of the Brazilians.*

Icon. —

Inhabits Brazil.

479. 5. *D. Opossum* (the Four-eyed Opossum.) Yellowish above, almost white underneath; a pale white spot above each eye; tail hairy, part only of its length.

*D. Opossum, Lin. Sys. Nat. i. 105.*

Sarigue, or Opossum, *Buff. x. 279. Philander, Seba, iv. Carigueia of the Brazilians; Le Quatreœil on moyen Sarigue de Cayenne, Cuv. Rég. Animal.*

Icon. *Buff. x. t. 45. t. 46. Seba i. t. 36. Shaw, Gen. Zool. a. t. 108.*

Inhabits Cayenne commonly, and probably other parts of America.

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480. 6. *D. Philander* (Philander Opossum.) Head very short; muzzle blunt; head marked with a red central longitudinal band; eyes placed in a gray spot. Tail naked, longer than the head; and body spotted with brown.

Did. Philander, *Schreb. Temminck, Monog.*  
Icon. *Schreb. vii. t. 147.*

Inhab. —

\* *Females without a Pouch.*

481. 7. *D. Cayopollin* (Mexican Opossum.) Yellowish gray above, whitish underneath, round the eyes, and upon the nose; tail brown, spotted with blackish, and much longer than the body.

*D.* Cayopollin, *Gm. i. 106.* Mus Africanus Cayopollin dictus, *Seba. Thes. t. 1.* Philander Africanus, *Brisson, Reg. Anim.*

Philandre de Surinam, *Seba. Cayopollin, Buff. x. 350.*  
Mexican Opossum, *Pennant.*

Icon. *Seba, Thes. i. pl. 91. f. 3.* *Buff. 10. f. 55. Ency. Method. t. 24. f. 5.*

Inhabits Mexico.

482. 8. *D. Murina* (Murine Opossum.) Yellow gray above; very pale yellow underneath; eyes surrounded with brown; tail naked, as long as the body.

*D.* Murina, *Gm. 107.*

La Marmose, *Buff. x. 335.*

Murine Opossum, *Shaw, i. 484.*

Icon. *Buff. x. t. 42 and 53.*

Inhabits Cayenne and Surinam.

483. 9. *D. Cinerea* (Gray Opossum.) Muzzle blunt; head small; ears contracted at the base; tail much longer than the head and body, very hairy at the base, end white;

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fur short, cottony above, ash-gray in the males, yellowish-gray in the female; beneath white.

*Didelphis Cinerea*, *Temminck, Monog.*

Icon. —

Inhab. Brazils. Prince Maximilian de Neuwied.

484. 10. *D. Dorsigera* (Back-bearing Opossum.) Head long; tail hairy at the base, of a uniform brown colour.

*Didelphis Dorsigera*, *Temminck, Monog.* 1. *Gmelin, Sys. Nat.* i. 107.

Icon. —

Inhabits. —

485. 11. *D. Nudicaudata* (Naked-Tailed Opossum.) Gray brown above, whitish underneath; a pale yellow spot over each eye; tail longer than the body, and entirely naked; no marsupial pouch, but a longitudinal fold of the skin along each side of the belly.

*D. Nudicaudata*, *Geoff. Collect. du Mus. d'Hist. Nat.*  
*Didelphis Myosuros*, *Temminck, Monog.* 38 ?

Inhabits Cayenne.

*Obs.* This species appears to differ from *D. Opossum*, principally in the fold of skin, instead of the marsupial pouch, and the total nudity of the tail.

*M. Temminck (Monog.)* describes his *D. Myosuros* as having a pouch in the female. He doubts the accuracy of *M. Geoffroy's M. Nudicaudata* being destitute of the pouch, and refers both conditionally to one species.

486. 12. *D. Crassicaudata* (Thick-Tailed Opossum.) Deeper yellow above, brighter over the eyes; tail nearly the length of the body, very thick at its insertion, and covered with a fold of skin, instead of a marsupial pouch, for about a third of its length.

*Didelphis Crassicaudata*, *Desm. Nat. Dict. d'Hist. Nat.*

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ix. 425. Third Micouré, with a thick tail, *d'Azara, Quad. du Paraguay.*

In the female specimen described by *d'Azara*, there were four mammæ on one side, and but two on the other, which fact, in addition to other observations made by *M. Desmarest*, seems to have induced that naturalist to suspect that the teats in these animals are developed at the time only of suckling, and then only in number corresponding with the young.

487. 13. *D. Lanigera* (Woolly Opossum.) Fur woolly, snuff colour above, whitish underneath; tail nearly triangular at its insertion, longer than the body, and naked on the upper side only, for about a third of its length; a fold of skin instead of a marsupial pouch.

*Didelphis Lanigera, Desm. Mam. D. Cayopollin, Desm. Dict. Hist. Nat.*

The second, or woolly Micouré of *d'Azara, Quad. of Paraguay.*

Inhabits Paraguay.

*Obs.* Only two individuals of this species appear to have been seen and described.

488. 14. *D. Brachyura* (Touan, or Short-Tailed Opossum.) Blackish-brown on the back, brightish red on the flanks, and white on the belly; tail short, covered with hair to the end; a fold of skin instead of a marsupial pouch.

*D. Brachyura, Pallas, Act. Petrop. 1780. D. Tricolor, Geoff. Col. Mus. Desm.*

Touan, *Buff. Sup. VII.*

Icon. *Pallas, Act. Petrop. t. 5. Buff. Sup. VII. pl. 4.*

Inhabits Cayenne and Paraguay.

489. 15. *D. Sebæ* (Seba's Opossum.) Fur deep red, brown above, and on the flanks, beneath whitish; tail half as long as the body.

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*D. Brachyura*, *Gmelin*, 108, not *Pallas*. *D. Sebæ*, *Gray*, *MSS*.

Short-Tailed Opossum, *Pennant*, vi. 26. *Mus Sylvestris Americana*, *Seba*, *Mus*. i. 50.

Icon. *Seba*, *Mus*. i. t. 31. f. 6.

Inhabits South America.

*Obs.* M. Temminck preserves the specific name *Brachyura* for the species, and *Tricolor* for the last.

490. 16. *D. Pusilla* (the Dwarf Opossum.) Mouse-colour; tail longer than the body, naked, of a white colour.

*Didelphis Pusilla*, *Desm. Nov. Dict. d'Hist. Nat.* 430.

The sixth, or Dwarf Micouré of *d'Azara*, *Quad. of Paraguay*.

Icon. —

Inhabits Paraguay.

*Obs.* *D'Azara* inspected only a male, so that the existence or non-existence of the marsupial pouch in this species is not ascertained.

**CHEIRONECTES.** *Incisors*  $\frac{1}{8}$ , *canines*  $\frac{1}{4}$ , *cheek-teeth pointed and trenchant*; muzzle pointed; ears naked; round feet, with five toes; the posterior plantigrade and palmated; thumb without a nail; nails sharp and bent; tail long, cylindrical, naked, scaly, and prehensile; abdominal pouch in the female.

*Obs.* In the *Régne Animal* this is printed as a subgenus. It is perhaps immaterial whether it be treated as a subgenus of *Didelphis* or a genus of *Marsupiatæ*.

491. 17. *D. Palmata* (the Yapock, or Palmated Opossum.) Brown above, with three transverse gray patches or bands, white underneath.

*Didelphis Palmata*, *Geoff.* *Didelphis Yapock*, *F. Cuv.* *Chironectes Memina*, *Illiger.* *Lutra Memina*, *Zimmerman*, *Bodd.* *Chironectes Yapock*, *Desm. Mam.*

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Le Yapock, *Cuv. Rég. Anim. Petit Loutre de la Guyane, Buff. Hist. Nat. Sup.* vii. 159.

Icon. *Buff. Sup.* vi. t. 22. nobis.

Inhabits the banks of the Yapock, a river of Guyane.

*Obs.* This species, which has been very generally treated as an Otter, has been separated by Illiger into a distinct genus, under the name of *Cheironectes*, or hand-swimmers.

Genus II.—*DASYURUS*.

Incisors  $\frac{3}{3}$ , small and regular, canines  $\frac{1}{1}$ , large; cheek-teeth  $\frac{6}{6}$ , the two first compressed and trenchant, the remainder with points on their crowns; head conical; five toes on the fore-feet, armed with crooked nails; four on those behind, unguiculated; thumb without a nail, short, distant from the fingers, being little else than a mere tubercle; tail long, covered all over with hairs; a marsupial pouch in the females.

492. 1. *Das. Cynocephalus* (the Dog-faced *Dasyurus*.) Yellowish-brown, crupper marked with transverse black bands; tail compressed. Size of a wolf.

*Didelphis Cynocephala*, *Harris, Transactions of the Lin. Soc. vol. ix. Dasyurus Cynocephalus, Geoff. Ann. Mus. xv. Thylacinus Harrisii, Tem. Monog. 63.*

Icon. *Lin. Trans.* ix. t. 19.

Inhabits Van Diemen's Land.

Mr. Brooks, it is understood, proposed to make this species a type of a new genus, to be named *Paracyon*. M. Temminck has since done so, and applied to it the name *Thylacynus*.

493. 2. *Das. Ursinus* (the Ursine *Dasyurus*.) Black, with occasionally a very few white spots; tail not very long, but naked on the under side, and subprehensile.

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*Didelphis Ursina*, *Harris, Lin. Trans. vol. ix.* *Dasyurus Ursinus*, *Geoff. Ann. Mus. t. 15.*

The Devil of the Colonist.

Icon. *Harris*, as above, *pl. 19.*

Inhabits Van Diemen's Land.

494. 3. *Das. Macrourus* (Spotted *Dasyurus*.) Marron-colour, spotted irregularly with white; the hairs of the tail not so long as in the other *Dasyuri*, but spotted like the body. Size of a Cat.

*Viverra Maculata*, *Shaw, Gen. Zool. vol. 1.* *Dasyurus Macrourus*, *Geoff. Ann. Mus. t. 3.*

Spotted Marten, *Phillips, Voyage to New Holland, 276.* *Dasyure tachete*. *Peron and Lesueur, Voy. aux Ter. Aust.*

Icon. *Peron and Leseur, Atlas, pl. 33, Ency. Méthod. Sup. t. 762.*

‡ Inhabits the vicinity of Port Jackson, in New Holland.

495. 4. *Dasyurus Maugei* (the *Dasyure* of *Maugé*.) Olive colour, spotted with white, except the tail, which is spotless.

*Dasyurus Maugei*, *Geoff. Ann. du Mus. t. 3.*

*Dasyure gutté*, *Desmarest, Nov. Dict. d'Hist. Nat. t. 24.*

Icon. — ?

Inhabits New Holland.

495 5. *Das. Viverrinus* (the *Viverrine Dasyurus*.) Black, spotted with white; without spots on the tail.

*Didelphis Viverrina*, *Shaw's Gen. Zool. v. 1.* *Dasyurus Viverrinus*, *Geof. Ann. Mus. III.*

Spotted Opossum, *Phillips' Voy. Tapoa tafa, or Tupha, White's Journal of a Voyage to New Holland.* *Dasyure tacheté*, *Cuv.*, and *Das. de White, Cuv.*

Icon. *White, Jour. Shaw, Gen. Zool. pl. III.*

Inhabits the vicinity of Port Jackson, in New Holland.

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This species is the type of the genus *Dasyurus*, as established by Illiger.

497. 6. *Dasyurus Tafa* (the Tapoa tafa.) Uniformly grayish brown, without spots.

*Dasyurus tafa*, *Geoff. Ann. du Mus.* III. Tapoa Tafa, *Var. White*; *Journal*, Viverrine Opossum, *Shaw*.

Icon. *White*, *Jour.* t. 281. *Shaw*, *Zool.* t. 1. p. 491. pl. 111, upper figure.

Inhabits the vicinity of Port Jackson, in New Holland.

498. 7. *Das. Penicillatus* (Brush *Dasyurus*.) Ashy-gray; the tail with long stiff black hairs toward the end.

*Didelphis penicillatus*, *Shaw*, *Gen. Zool.* v. 1. 502. *Dasyurus penicillatus*, *Geoff. Ann. du Mus.* *Phascogale penicillata*, *Tem. Monog.* 58.

Icon. *Shaw*, *Zool.* t. 1. pl. 3. *Schreb.* 152.

Inhabits New Holland.

499. 8. *Das. minimus* (the Dwarf *Dasyurus*.) Uniformly ashy-red; each hair red at the point, dark cinerous at the base; thumb of the posterior extremities larger, and the teeth more regular than in the other species.

*Dasyurus minimus*, *Geoff. Ann. du Mus.* III. *Phascogale minimus*, *Tem. Monog.* 59.

*Dasyure nain*, *Cuv. Reg. Anim.*

Icon. —

Inhabits the southern part of Van Diemen's Land.

*Obs.* These two species form the *Phascogale* of M. Temminck.

## Genus III. PARAMELES.

Cutting-teeth  $\frac{1}{8}$  or  $\frac{1}{9}$ ; the last on each side of the upper jaw very long; of the lower, divided in half by a

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groove; canine  $\frac{1}{11}$ , long; cheek-teeth  $\frac{1}{7}$  or  $\frac{2}{8}$ ; crowns acutely tubercular; head very long; toes of fore-feet five, distinct, the three middle largest, and the thumb nearly rudimentary; hind-feet longer than the fore; toes four; two internal, very small, united and enveloped in the skin, so that the claws only are to be seen; the third very long, with a strong claw, and the outer very small; tail long, pointed; base thick and naked beneath; not prehensile.

500. 1. *P. Nasuta* (the Long-nosed Pouched Badger.) Head very long; muzzle thin; nose prolonged beyond the jaws; cutting teeth  $\frac{1}{8}$ ; fur above gray-brown; beneath white.

*Parameles nasuta*, *Geoff. Ann. Mus.* iv. 62. *Thybaïs nasuta*, *Illiger, Prod.*

Icon. *Geoff. Ann. Mus.* iv. t. 44, with skull and toes.

\* Inhab. New Holland.

501. 2. *P. Bougainvillia* (Bougainville's Pouched-Badger.) Head long; acute ears; ovate, long; body above red; beneath gray.

*Parameles Bougainvillia*, *Quoit and Gaimard.*

Icon. *Quoit and Gaimard, Freycinet's Voyage.*

Inhab. —

502. 3. *P. Obesula* (the Fat Pouch-Badger, or Porculine Opossum of Shaw.) Head rather short; forehead convex; cutting teeth  $\frac{1}{8}$ ; fur above reddish-yellow; beneath white.

*Didelphis Obesula*, *Shaw, Gen. Zool.* i. 490. *Isodon*, *Geoff. Dict. Hist. Nat. ed.* vi. *Thylaris Obesula*, *Illiger, Prod.* 76. *Parameles Obesula*, *Geoff. Ann. Mus.* iv. 64.

Icon. *Shaw, Nat. Misc. n.* 96. t. 298. *Geoff.* l. c. t. 45, with skull. *Ency. Méthod. Supp.* t. 9. f. 5.

Inhab. New Holland.

SYNOPSIS OF THE

SUB-DIVISION II. *Cutting-teeth*  $\frac{6}{2}$ ; *the lower very long*; *canines in the lower-jaw, very small or wanting*.

GENUS IV. PHALANGISTA.

*Cutting-teeth*  $\frac{6}{2}$ ; *canine*  $\frac{11}{1}$  or  $\frac{9}{0}$ ; *false grinders*  $\frac{3}{2}$  or  $\frac{4}{1}$ ; *grinders*  $\frac{4}{2}$  or  $\frac{4}{2}$ ; *head elongate*; *forehead convex*; *feet five-toed, not united to the body by the skin of the sides*; *tail naked or covered with hair*.

\* *Tail naked or scaly, prehensile.*

503. 1. *P. Maculata* (Spotted Phalanger.) Fur whitish, spotted with brown or black, size of a Cat.

*Didelphis Orientalis*, *Gmelin, Sys. Nat.* *Cuscus Amboinensis*, *Lacepede*. *Phalangista Maculata*, *Geoffroy, Col. Mus. Par. Desmar. Mam.* 266. *Balantia Orientalis*, *Illiger, Prod.* 78.

Phalanger male, *Buff. Hist. Nat.* XII. Surinam-Rat. *Coscoeos of the Natives*.

Icon. *Buffon, H. N.* XIII. t. 11. *Ency. Method.* t. 24. f. 1. Inhab. Molluca, Java.

504. 2. *P. Rufa* (Red Phalanger.) Fur reddish or whitish, with a darker dorsal line.

*Didelphis Orientalis*, Var. *Gmelin, Sys. Nat.* *Phalangista Rufa*, and *Alba*, *Geoff. Col. Mus. Par.* *P. Rufa*, *Desm. Mam.* 266.

Phalanger, femelle, *Buffon, Hist. Nat.* XIII.

Icon. *Buffon, H. N.* XIII. t. 10. *Ency. Method.* t. 24. f. 2. Inhab. Molluca, Java.

505. 3. *P. Papuensis*, body above gray; beneath yellowish-white; upper part of the head gray; throat and chest white; upper part of the extremities brown; ears very small, hairy.

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Phalangista Papuensis, *Desm. Mam.* 541. P. Quoiicy, *Gaimard, Bull Sci.* vii. 64.

Icon. —

Inhab. New Guinea.

*Obs* This seems to be considered by M. Temminck as a variety of the last.

506. 4. *P. Ursina* (Bear-like Phalanger.) Fur thick; black, with a yellowish cast, caused by the end of the hairs being tipped with that colour; tail very furry; size of a Civette.

*Phalangista Ursina, Temminck, Monag. de Mamm.*

Icon. *Temminck, l. c. t. 8. and Osteology, t. 4.*

507. 5. *P. Chrysorrhos* (Yellow-tufted Phalanger.) Fur short, thick, cottony; head pale ash-gray; ears white above; blackish-gray, with a black line on each flank; rump and end of the tail bright golden yellow; beneath white; hinder part reddish.

*P. Chrysorrhos, Temminck, Monag. de Mamm. p. 12.*

Icon. —

Inhab. Island of Celebres.

\*\* *Tail hairy, prehensile.*

508. 6. *P. Vulpina* (Fox-like Phalanger.) Fur gray-brown above, passing into yellow-gray on the head and shoulders; gray beneath; tail tufted; base like the back, end black.

*Didelphis Lemurina, Shaw, Zool.* i. 487. *D. Vulpina, Shaw, l. c.* 363. *D. Peregrinus, Bod. Elench. Anim.* Phalangist *Vulpina, Desm. Nouv. Dict. Hist. Nat.* xxv. 475.

Wha Topoa Voo, *White, Jour. Voy. to New South Wales,* 278. Lemurine Opossum, *Shaw, i.* 487. New South Wales Opossum, *Bewick, Quad.* 376. New Holland Bear, *Pennant, Quad.* vi. 13. Vulpine Opossum, *Phillips, Voy.* 150. Le Bruno, *Vicq. d'Azyr. Sys. Anat. des Anim.* vi. 251.

SYNOPSIS OF THE

Icon. *Shaw, Zool. i. t. 110. Phillips' Voy. t. 16. Bewicki, Quad. i. 376. F. Cuv. Dent. Mamm.*

Inhab. Port Jackson.

509. 7. *P. Cookii* (Cook's Phalanger.) Fur brown or reddish-gray above; white beneath; tail brown, and white at the end; size of the Pole cat.

Phalangista<sup>1</sup> *Cookii, Desm. Mamm. 268. Petaurista Cookii, F. Cuv. Dent. Mamm.*

Opossum. *Hawskworth, Voy. vii. 586. Cook's last Voyage, i. 108. White-tailed Opossum, Shaw, Zool. i. 504. Phalanger de Cook, Cuv. Rég. Anim. i. 779.*

Icon. *Cook's Voy. t. 4. Ency. Méthod. Supp. t. 8. f. 3.*

Inhab. Van Diemen's Land.

This species differs from the former in its teeth according to M. F. Cuvier.

510. 8. *P. Nana* (Dwarf Phalanger.) Fur reddish-gray above; white beneath; tail brown.

Phalangista *Nana, Geoff. MSS. Desm. Mamm. i. 268.*

Icon. —

Inhab. East Coast of Van Diemen's Land.

GENUS V.—PETAURISTA.

Cutting-teeth,  $\frac{2}{3}$ ; lower horizontal; canine  $\frac{1}{6}$  or  $\frac{1}{3}$ ; cheek-teeth  $\frac{2}{6}$  or  $\frac{1}{6}$ ; head rather long; eyes small; ears long; feet short; five toes; the hinder with a large nail-less thumb; the two first toes short, united by a common skin; claws compressed, arched; skin of the sides extended and uniting the extremities, so as to form a parachute. Tail long; hairs not prehensile.

\* Tail round.

511. 1. *P. Taguanoides* (Petaurine Opossum.) Fur very soft; gray-brown, or shining-brown above; throat and chest white; tail brown, yellowish-brown at the base.

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*Didelphis Petaurus*, *Shaw, Gm. Zool. Petaurus Tauguanoides*, *Desm. Nouv. Dict. Hist. Nat.* xxv. 400. *Phalangista Petaurus*, *Illiger, Prod.* 78. *Petaurista Tauguanoides*, *Desm. Mamm.* i. 269. *Phalanger Tauguanoides*, *Geoff. Col. Mus. Var.*

The Southern *Petaurus*, *Shaw, Zool. Misc.* *Hepoona Koo*, *White, Journal of a Voy. N. S. W.* 208. *Grand Phalanger Volant*, *Cuv. Rég. Anim.*

Icon. *Shaw, Zool.* i. t. 112. *White, Journal*, t. *Shaw, Nat. Misc.* t. 60.

Inhabits Port Jackson.

512. 2. *P. Macroura* (Large-tailed *Petaurista*). Fur gray-brown above, whitish beneath; tail thick; longer than the body; base brown, end black.

*Didelphis Macroura*, *Shaw, Gen. Zool.* i. 113. *Petaurus Macrourus*, *Desm. Dict. Hist. Nat.* xxv. 402.

*Phalanger Volant a grande queue*, *Cuv. Rég. Anim.* 1. 180.

Icon. *Shaw, New Holland Zoology*, t. 12. *Shaw, Gen. Zool.* t. 113. *Ency. Méthod. Supp.* t. 8. f. 4.

Inhab. New Holland.

513. 3. *P. Flaviventer* (Yellow-bellied *Petaurista*). Fur chesnut-brown above, yellowish-white beneath; tail chesnut-brown, round; a little longer than the body

*Petaurus Flaviventer*, *Desm. Dict. Hist. Nat.* xxv. 403. *Petaurista Flaviventer*, *Geoff. MSS. Desm. Mam.* 269.

Icon. —

Inhab. New Holland.

514. 4. *P. Sciurea* (Squirrel *Petaurista*). Fur above ash-gray, edges of the parachute and dorsal line deep-brown; beneath white; head, yellow-gray; tail, reddish gray at its base, end black, crown revolute.

SYNOPSIS OF THE

*Didelphis Sciurea*, *Shaw, Zool. of New Holland*, 29; *Gen. Zool.* 1; *Petaurus Sciureus*, *Desm. Dict. Hist. Nat.* xxv. 403. *Phalangista Sciurea*, *Illiger's Prod.* 78. *Petaurista Sciurea*, *Desm. Mamm.* i. 270.

Norfolk Island Squirrel, *Pennant, Quad. Squirrel Opossum*, *Shaw, Zool.*

Icon. *Shaw. New Hol. Zool.* t. II; *Gen. Zool.* i. t. 113.

Inhab. New Holland.

515. 5. *P. Peronii* (Peron's *Petaurista*). Body brown above, white beneath; parachute above brown, varied with gray, legs white; end of tail white.

*Didelphis Sciurea* Var. *Shaw, Gen. Zool.* *Petaurus Peronii*, *Desm. Dict. Hist. Nat.* xxv. 404. *Petaurista Peronii*, *Desm. Mamm.* i. 270.

Icon. —

Inhab. New Holland.

\* \* \* Tail feathery.

516. 6. *P. Pygmea* (*Pygmea Petaurista*). Fur uniform, mouse-gray; with a reddish cast on the back, and a white one beneath.

*Didelphis Pygmea*, *Shaw, Zool. Nat. Hist.* 5. *Gen. Zool.* i. *Petaurista Pygmæus*, *Desm. Dict. Hist. Nat.* v. 405. *Phalangista Pygmea*, *Geoff. Col. Mus. Var. Desm. Mam.* 270. *Acrobata Pygmea*, *Gray, King's Voy. to New Holland.*

Icon. *Shaw, Gen. Zool.* t. 114. *Ency. Method. Suppl.* t. 8. f. 5.

Inhab. New Holland.

SUB-DIVISION III.—*Cutting-teeth*  $\frac{4}{2}$ ; *the lower very long, shearing*; *canine*  $\frac{1}{1}$ .

GENUS VI.—POTOROUS.

*Cutting-teeth*  $\frac{4}{2}$ ; *canine*  $\frac{1}{1}$  small; *grinders*  $\frac{4}{2}$ . *Head* long, pointed. *Ears* large, upper-lid cut. *Fore-legs* short.

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Toes five, sharply clawed; the third very large, with a large claw; the fourth moderate. Tail long, rather thick.

517. 1. *P. Murinus* (Kangaroo Rat). Fur brownish above, gray beneath.

Macropus Minor, *Shaw, Gen. Zool.* Hypsiprymus Murinus, *Illiger, Prod.* 79. Potorous Murinus, *Desm. Mamm.* 271. Kangurus Gaimardi, *Desm. Mam.* II. 540.

Kangaroo Rat, *Philips' Voy. Bot. Bay,* 277. Potooroo or Kangaroo-Rat, *White's Journal of a Voyage to New South Wales,* 286. Lesser Kangaroo, *Penant, Quad.* II. 32.

Icon. *Philips, l. c. t.* 47. *White, l. c. f.* 60. *Shaw's Gen. Zool. t.* 116. *Ency. Méthod. Suppl. t.* 962.

Inhab. New Holland.

M. F. Cuvier observes that there are three or four species of this genus. Messrs. Quoy and Guimard have named two, *P. Lesuerii*, from the head only, and *P. Peronii*, from the skeleton in the Paris Museum.

GENUS VII.—KANGURUS.

Cutting-teeth  $\frac{3}{4}$ , canine  $\frac{3}{4}$ ; cheek-teeth  $\frac{2}{4}$ . Head elongated. Ears large, pointed; eyes large. Fore-legs very short; toes five, strongly clawed. Hind-legs very long, strong; toes four; the two inner small, united; the central very large, strongly clawed; the outer moderate; the metatarsus very long, thin; sole applied the whole length to the earth. Tail long, very strong; not prehensile, used in jumping.

518. 1. *K. Labiatus* (Large Kangaroo). Fur ash-gray above, white beneath, with an ash gray line across the chin; the legs and upper part of the tail blackish.

SYNOPSIS OF THE

*Didelphis Gigantea*, *Gmelin, Sys. Nat. f.* 109. *Macropus Gigantea*, *Shaw, Zool.* 505. *Halmaturus Gigantea*, *Illiger. Prod.* *Kangurus Labiatus*, *Geoff. Mus. Desm. Mamm.* 273.

Kangaroo, *Cook's First Voyage.* vi. 277. Great Kangaroo, *Shaw, l. c.*

Icon. *Cook's First Voyage*, vi. f. 20. *Philips' Voyage*, t. 10. *White, Jour. of a Voy.* t. 54. *Shaw. Zool. Ency. Méthod.* t. 21. f. 4.

Inhab. Botany Bay. Discovered by Captain Cook in 1770.

519. 2. *Kangurus Fuliginosus* (Sooty Kangaroo). Fur sooty, brown above; clear gray beneath the legs, and tail blackish.

*Kangurus Fuliginosus*, *Peron and Leseuer, Desm. Mamm.* 273. *Macropus Giganteus*, *F. Cuv. Desm. Mamm.* Kangaroo Giant, *F. Cuv. Mamm. Lithog.*

Icon. *F. Cuv. l. c.*

Inhab. South Coast of New Holland, and near Port Jackson.

520. 3. *Kangurus Rufus* (Red Kangaroo). Fur woolly, clear red above, white beneath.

*Kangurus Rufus*, *Desm. Mam.* i. 541. *K. Lanosus*, *Guisard, Sor. Hist. Nat. Par. Bul. Sci.*

Icon. —

Inhab. the Blue Mountains in the interior of New Holland.

521. 4. *K. Griseus* (Gray Kangaroo). Fur reddish gray above, paler beneath; legs and end of the tail becoming brown; lower part of the tail reddish gray.

*Kangurus Rufogriseus*, *Peron and Leseuer.* *K. Griseus*, *Desm. Mamm.* 273. *Macropus Rufogriseus*, *F. Cuv. Desm. Mamm.*

Inhab. New Holland.

SPECIES OF MAMMALIA.

522. 5. *K. Ruficollis* (Red-necked Kangaroo). Fur hare-gray above, pure white beneath. Neck and upper part of the shoulders red, variegated with gray; beneath the tail red.

*Kangurus Ruficollis*, *Peron and Lesseuer, Desm. Mam.*, 1. 274. *Macropus Ruficollis*, *F. Cuv.*

Icon. —

Inhab. King's Island.

523. 6. *K. Eugeniei* (Eugene's Kangaroo.) Fur gray-brown above; front of the fore-legs variegated with red; below whitish; lower part of the tail reddish-white.

*Kangurus Eugeniei*, *Peron and Leseuer, Voy.* vi. 117. *Desm. Mam.* 274.

Icon. —

Inhab. Isle of Eugenia, New Holland.

Considered by most of the French naturalists as the young state of the former species.

524. 7. *K. Fasciatus* (Banded Kangaroo.) Fur gray, with brown band across the back and loins.

*Kangurus Fasciatus*, *Peron and Leseuer, Voy. aux Terns Aust.* 1. 114. *Halmaturus Fasciatus*, *F. Cuv. Desm.*

Kangaroo, *Dampier Voyage to New Holland*, 1v. 111. Kangaroo Elegant, *Cuv. Col. Mus. Par.*

Icon. *Peron. l. c. Atlas*, t. 27. *Dict. Hist. Nat.* xvii. t. 22.

Inhab. East Coast of New Holland.

M. F. Cuvier considers it the type of a genus distinct from *Macropus*, for which he has adopted the name of *Halmaturus*, used by Illiger for the Kangaroos.

525. 8. *Kangurus Billardieri* (Labillardiere's Kangaroo.) Ears short, oval, rounded; fur uniform; gray-brown above; reddish beneath; upper-lip reddish.

*Kangurus Billardieri*, *Desmarest, Mamm.* 542.

## SYNOPSIS OF THE

Icon. —

Inhab. Van Diemen's Land.

526. 9. *Kangurus Brunii* (Le Bruu's Kangaroo.) Fur brown above; yellow beneath.

*Didelphis Brunii*, *Gmelin, Sys. Nat.* i. 109. *D. Asiatica*, *Pallas, Art. nov. Petrop.* Kanguros Bicolor, *Mus. Paris.* *Kangurus Brunii*, *Desm. Mam.* 278. *Halmaturis Brunii*, *Illiger, Prod.* 80.

Felander, *Valentyn Amboyne*, vi. 275. *Le Bruyn, Voy. aux Indes*, 374. Javan Opossum, *Pennant, Quad.* vi. 22. *Shaw*, i. 402.

Icon. *Le Bruyn, Voyage aux Ind.* 374. t. 213.

Inhab. Aroe Islands.

527. 10. *Kangurus Pencillatus* (Tufted-Tailed or Mountain Kangaroo.) Fur above gray, variegated with darker tint; beneath rufous-brown; feet dark; tail as long as the body, and tufted at the end; head dark gray, with a dark longitudinal dorsal line, and a pale spot on the cheek and under the throat.

Icon. nobis, from a drawing by Lewin, made in New Holland.

Inhab. New Holland. In the collection of the Linnean Society.

The *Macropus Lanigerus* (Woolly Kangaroo) noticed at Vol. III. p. 49, is not inserted in the table, in the existing absence of more decided particulars.

## GENUS VIII.—PHASCOLARCTOS.

Cutting-teeth  $\frac{5}{2}$ , false-grinders  $\frac{3}{3}$ , grinders  $\frac{11}{4}$ , with two tubercles; ears large and pointed; feet with five toes, the fore-feet parted into two groups; the thumb and under-

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finger on one side; and the three others on the opposite; the hind-feet with a large distinct clawless thumb, and the two inner fingers small, united to the claws. The Baron Cuvier describes the animal as thumbless.

Mr. Gray observes, that the skull of specimen which he examined "had a short canine-tooth in the upper jaw, and grinders  $\frac{4}{5}$ , all with two fangs; the first on each side small, rather compressed, and the rest depressed with acute tubercles, so that they exactly agreed with the Potorus in the number, but the length of the jaws were more equal, and the skull was compressed and depressed, so as to be subquadrangular. The temporal fossæ larger." Mr. Gray refers the animal to the group of Phalangers.

528. 1. *K. Koala*, (The Koala.) Of an uniform chocolate colour; fur long, thick, and harsh; size of a moderate dog.

*Phascolarctos Fuscus*, *Blainville?* *Desm. Mamm.* 276 ?  
*Lepurus Cinereus*, *Goldfuss Schreb. South.*

*Koala*, *Cuv. Reg. Anim.* II. 184. *Coala* or *Koala*, *Blainville?* *Koala*, or *New Holland Sloth.*

*Icon. Cuv. Reg. Anim.* IV. t. 1. *Ency. Method. Supp.* t. 9. f. 4.  
Inhab. New Holland.

SUB-DIVISION IV.—E. *Cutting-teeth*  $\frac{3}{2}$ , *canine-teeth*  $\frac{2}{0}$ .

### PHASCOLOMYS.

*Cutting-teeth*  $\frac{3}{2}$ , very strong and thick, short; the upper ones converging at their tips, canine  $\frac{2}{0}$ , grinders  $\frac{4}{5}$ , separated from the cutting teeth by an empty space; crown oval, flat, separated into two by a groove; body thick; head large, flat; ears short; feet with five toes; claws of the fore-feet strong; the thumb of the hind-feet small, indistinct, clawless; tail very short or reddish-brown.

## SYNOPSIS OF THE

530. 1. *P. Wombat*, (The Wombat.) Fur uniform, grayish ; about as big as a Badger.

*Phascolomys Wombat*, *Peron and Leseuer, Voy. aux Terres Aust.* *Wombatus, Fossor Geoff. Ann. Mus.* vi. 364. *Phascolomys fusca, Desm. Dict. Hist. Nat.* xxv.

Wombat, *Colonists.*

Icon. *Peron and Leseuer Atlas, t. 28. Ency. Method. Supp.* t. 9. f. 1. *Leach, Zool. Misc. Cuv. Reg. Anim.* iv. t. skul.

Inhab. King's Island, and near Port Jackson, New Holland.

*Obs.* The Wombat described by Bass and Flinders is said to have six cutting and two canine-teeth in each jaw, from which Illiger formed his genus *Amblotis*. Is it different from the above ?

Since the Synopsis of *Felinæ* was printed, M. Temminck's monograph of the genus came to hand. We are unable therefore to avail ourselves of the result of that eminent zoologist's observations, further, than by inserting here a marginal notice of the several species which, on repeated inspection and comparison, he admits into the genus. These are, 1. *F. Leo* ; 2. *F. Tigris* ; 3. *F. Jubata* ; 4. *F. Leopardus*, (apparently our Panther.) 5. *F. Pardus*, (apparently our Leopard.) 6. *F. Macrocelis*, (the *Nebulosa* of Hamilton Smith.) 7. *F. Serval and Capensis* ; 8. *F. Cervaria*, (probably the Siberian Lynx figured in this work.) 9. *F. Borealis*, (probably the Canada Lynx.) 10. *F. Lynx* ; 11. *F. Pardina*, (the *Loup Cervier* of Perrault.) 12. *F. Caracal* ; 13. *F. Aurata*, (an inedited species, bay-red above, sprinkled with little spots on the sides ; tail half as long as the body, with a brown band down the upper side ; tip black.) 14. *F. Chaus* ; 15. *F. Caligata*, (the *Booted Lynx*.) 16. *F. Catus* ; 17. *F. Maniculata*, (apparently the *F. Catenata* of Hamilton Smith.) 18. *F. Minuta*, (the *Kuwuk* of Java.) 19. *F. Puma* ; 20. *F. Onca* ; 21. *F. Jaquaramdi* ; 22. *F. Celidogaster*, (apparently the *F. Chalybeata* of Hamilton Smith.) 23. *F. Rufa* ; 24. *F. Pardalis* ; 25. *F. Macroura* ; 26. *F. Mitis* ; 27. *F. Tigrina*.

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### ORDER IV.—RODENTIA.

Two large incisors in each jaw, separated from the cheek-teeth by a void space, and which wear by use, and grow again on the inner side. No canine teeth; cheek-teeth in some genera with flat or ridged crowns, in others, with blunt tubercles. Lower jaw articulated by a longitudinal condyle; orbits not separated from the temporal fossæ; zygomatic arches small; toes variable in number; nails unguiculated; stomach simple; intestines long; cæcum large.

*Eats* in general vegetable matter, but the species with tuberculated teeth are nearly omnivorous.

*Habits* various, generally timid.

*Inhabits* the Continents, and larger islands, but not those of the South Sea.

#### SECTION I.—*With Clavicles.*

##### GENUS I.

CASTOR.—Incisive teeth,  $\frac{3}{2}$ ; canines,  $\frac{0}{0}$ ; cheek-teeth,  $\frac{14}{14}$ =20. Incisive teeth very strong, with the anterior surface flat, and the posterior, angular; the cheek-teeth with a sort of fold or ridge of enamel on the internal edge, and three similar folds on the external edge of the upper teeth, which apparent folds are inversed in the lower teeth; eyes small; ears short and round; five toes on all the feet, the anterior short and close, the posterior longer and palmated; tail large, flat, naked, and scaly; a pouch, into which an unctuous matter is secreted near the genitals of the male.

531. 1. *Castor Fiber* (the Beaver.) Rather larger than the Badger, uniformly reddish brown, with a shorter downy gray fur.

## SYNOPSIS OF THE

Castor fiber, *Lin* *Kαστωρ*, *Arist. Hist. Anim.* Fiber, *Pliny*, l. 8, c. 30.

Beaver, *Ray*, *Synop.* 209. Le Castor ou le Bièvre, *Buff.* t. 8. 282.

Icon. *Screb. tab.* 175. *Buff. l. c. pl.* 36. *F. Cuvier*, *Mam. lithog.* *Pennant*, *Br. Zool.* 1. *pl.* 9, and *Hist. Quad. pl.* 71.

Inhabits North America, and the vicinity of some of the larger rivers of Europe, as the Rhine, the Rhone, and the Danube.

*Obs.* The Beaver is considerably subject to vary in colour, thus M. Geoffroy notes that the Beaver of France is generally of an olivaceous yellow, *Brisson (Règne Anim.* 135) describes the white Beaver. Black, spotted, and yellow varieties, have also been noticed.

### GENUS II.—MUS, *Lin.*

Incisive teeth,  $\frac{3}{3}$ ; canine teeth,  $\frac{0}{0}$ ; cheek-teeth varying in the different subgenera; anterior toes, four or five; posterior, five; anterior limbs furnished with clavicles.

SUB-GENUS I.—FIBER, *Cuv.*—*Incisive teeth*,  $\frac{3}{3}$ ; *canines*,  $\frac{3}{3}$ ; *cheek-teeth*,  $\frac{3}{3}$ ; *the lower incisors sharp pointed, and convex in front, cheek-teeth with flat tops, furnished with scaly transverse zigzag laminae; anterior feet with four toes, and the rudiment of a thumb; posterior, with five, with the edges furnished with stiff hairs, used in swimming like the membrane of palmated feet; tail long, compressed laterally; an oderiferous unguent secreted in both sexes.*

532. 1. *F. Zibethicus* (the Ondatra, or Musk Arvicola.) About the size of a Rabbit; reddish gray, ashy underneath.

Castor *Zibethicus*, *Lin.*  $\vee$  *Mus Zibethicus*, *Gm.*

L'Ondatra, *Buff. t.* 10. Rat musqué, *Sarrazin Mem. de l'Acad.* 1725, 323, Rat Musqué de Canada, *Briss. Régn. Anim.* 136. Musk Rat, *Lawson's Carolina*, 120. Musquash,

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*Josselyn's New England. Massachus, Smith's Virginia*, 27.

Musk Beaver, *Pen. Quad.* II. 118.

Icon. *Sarrazin, l. c. tab. II. Buff. l. c. pl. 1.*

Inhabits Canada, and other parts of North America.

SUB-GENUS II.—ARVICOLA, LACEP. (Campagnols ordinaires, Cuv.) *Teeth like those of last sub-genus; but the hind feet have not the stiff hair or swimming apparatus; tail round and hairy.*

533. 1. *A. Amphibius* (Water-Rat.) Blackish gray, slightly tinted with yellow, lighter underneath; tail black; rather larger than a common Rat.

*Mus Amphibius, Lin. Syst. Nat. 82, and Faun Suec, No. 32. Mus aquaticus, Briss. Rég. Anim. 175. Mus aquatilis, Ray, Synops. 217.*

Rat d'Eau, *Buff. t. 7. Wasser-maus, Kramer, Austr. 316. Water-Rat, Pen. Br. Zool. I. No. 27.*

Icon. *Belon. 30, tab. 31, Buff. l. c. tab. 43, Screb. 186.*

Inhabits the whole of Europe, Northern Asia, and North America.

Var. a. *Niger, Lin.* Inhabits Siberia.

Var. b. *Maculata, Pallas*, yellowish, with a large white spot on the shoulder.

Var. c. *Paludosa, Lin.* black, feet white.

534. 2. *A. Arvalis* (the Field-Mouse.) About as big as the common Mouse; reddish ash colour; ears small and round.

*Mus agrestis, Ray, Syn. 218. Mus terrestris, Lin. Syst. 82. Mus campestris minor, Briss. Regn. Anim. 176. Mus arvalis, Pallas, Nov. sp. fasc. I. 78.*

Campagnol, *Buff. Hist. Nat. t. 7. Short-tailed Field Mouse, Pen. Br. Zool. I. No. 31, and Meadow Rat, Quad. II. 205.*

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Icon. *Buff. l. c. tab. 47, Screb. 191.*

Inhabits Europe and Northern Asia

535. 3. *A. Œconomus* (Œconomic Rat.) Rather larger than the last, and the females larger than the males; brown above, yellowish underneath; ears short; tail about one-fourth the length of the body.

*Mus œconomus, Pallas, Nov. Spec. Glires, n. 125.*

La Fegoule, *Vicq-d'Azyr, Syst. des Anim. t. 2. 389.*  
Œconomic Rat, *Pen. Quad. 194.*

Icon. *Pallas, l. c. pl. 14, A. Screb. tab. 190.*

Inhabits Siberia and Eastern Asia, in the deep and humid valleys. M. Bosc found a specimen in the forest of Montmorency, which he refers to this species.

536. 4. *A. Saxatilis* (the Rock-Rat.) About four inches long; brown, mixed with gray above, deep gray on the sides, and whitish underneath; tail as long as the body.

*Mus saxatilis, Pallas, Glires, p. 80 and 256.*

Le Saxin, *Vicq-d'Azyr, Syst. des Anim. t. 2, 452.* Rock-Rat, *Pen. Quad. 192.*

Icon. *Pallas, l. c. pl. 23, B. Screb. 185.*

Inhabits Siberia.

537. 5. *A. Alliarius* (Garlic Mouse.) About four inches long; tail, one and a half; ashy-gray above, white underneath; ears large, nearly denuded.

*Mus alliarius, Pallas Glires, 251.*

L'Alliaire, *Vicq-d'Azyr, Syst. des Anim. t. 2, 393.* Garlic Rat, *Pen. Quad. 11. 197.*

Icon. *Pallas, l. c. pl. 14. C. Schreb. 187.*

Inhabits Siberia.

538. 6. *A. Rutilus* (Red Mouse.) Rather less than the last; reddish above, pale white underneath; ears moderate.

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*Mus rutilus*, *Pallas, Glires*, 248.

Le rona, *Vicq-d'Azyr, Syst. des Anim. t. 2*, 402. Campagnol doré ou roux, *Desm. Nov. Dict. d'Hist. Nat. Red Rat, Pen. Quad. II.* 198.

Icon. *Pallas, l. c. pl. 14, B. Screb.* 188.

Inhabits Siberia, and extensively in Northern Asia.

539. 7. *A. Gregalis* (Baikal Mouse.) About three inches long; pale gray on the back, with long black hairs intermixed, sides paler, belly white; tail black, one fourth the length of the body; ears large.

*Mus gregalis*, *Pallas Glires*, 238. Le Gregari, *Vicq-d'Azyr, Syst. des Anim. t. 2*, 400. Baikal Rat, *Penn. Quad. II.* 204.

Icon. *Pallas, l. c. pl. 17, Screb. t.* 189.

Inhabits Eastern Siberia.

540. 8. *A. Socialis* (Social Rat.) About three inches long; tail an inch; pale gray above, white underneath; ears short, but broad.

*Mus socialis*, *Pallas, Glires*. 218. *Mus gregarius*, *Lin. Syst. Nat. Ed. 11*, 84. *Mus terrestris*, var. *Erzleban*, *Syst. Nat.* 397.

Campagnon, *Vicq-d'Azyr, Syst. des Anim. t. 2*, 397. Social Rat, *Pen.* 203.

Icon. *Pallas, l. c. t. 13, B.*

Inhabits the vicinity of the Caspian Sea.

541. 9. *A. Pumilio* (Lineated Mouse.) Bright brown above, marked with four longitudinal black bands.

*Mus pumilio*, *Gmel. Syst.* 130, *Sparman, Voy. t. 2.* 376.

Lineated Mouse, *Pen. Quad. 2*, 191. *Rat nain du Desmarrest*, *Nov. Dict. d'Hist. Nat.*

Icon. *Sparman, l. c. pl. 9, and Act. Stock. 1784, t. 6, Penant, l. c. pl. 82.*

Inhabits South Africa, eastward of Cape of Good Hope.

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542. 10. *A. Albicaudatus* (White-tailed Mouse.) About five inches long; brown, with the paws and upper side of the tail white; tail half the length of the body.

*Lemmus albicaudatus*, Geoff. *Catt. de la Collection du Mus.*

Icon. —

Inhabits

543. 11. *A. Niloticus* (Egyptian Arvicola.) Brown, intermixed with yellow on the upper parts, yellowish gray underneath; tail brown, nearly as long as body; ears large, denuded, brownish.

*Lemmus niloticus*, Geoff. *Descript. de l'Égypte.*

Icon. *Geoff. l. c.*

Inhabits Egypt.

544. 12. *A. Fulvus* (Yellow Arvicola.) About four inches long; reddish yellow; belly and paws more yellow; tail less than half the length of the body.

*Lemmus Fulvus*, Geoff. *Catal. de la Coll. du Mus.*

Icon.

Inhabits France.

Desmarest inserts a mark of doubt on the following species.

545. 13. *A. Argentoratensis* (the Schermaus or Strasbourg Arvicola.) Six inches long; tail about two; dusky gray; eyes small; external ears scarcely visible; edge of the mouth fringed with white.

Schermaus, *Herman*. Schermaus, *Buff. Sup. t. 7*. F. Cuvier, *Dict. des Sciences, Natural, t. 6*. *Arvicola argentoratensis*, *Desm. Ency. Méthod. Mam. sp.* 436.

Icon. *Buff. l. c. pl.* 70.

Inhabits the vicinity of Strasbourg.

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546. 14. *A. Xanthognatus* (Yellow-cheeked Arvicola.) Yellow, varied with black on the upper parts; ashy-gray underneath; cheeks yellow. Length five inches.

Lemmus *Xanthognatus*, *Leach, Nat. Miscel.* 1. *Arvicola Xanthognatus*, *Desm. Ency. Méthod. sp.* 441. *A. Xanthognata*, *Harlan.*

Icon. *Leach, l. c. t.* 26.

Inhabits the shores of Hudson Bay.

*Obs.* Perhaps a variety of the common species.

547. 15. *A. Hortensis* (Garden Campagnol.) Body above ferruginous brown; sides lead-coloured; underneath yellow; hairs coarse, standing more or less obliquely from the body, giving the animal a shaggy appearance; ears broad, oval; head globular; snout contracted, conical; tail more than half as long as the body. Length of body and head five inches and a half, tail two inches and a half.

*Arvicola hortensis*, *Harlan, Faun. Amer.* 138.

*Sigmodon*, *Say et Ord. Jour. Acad. Nat. Sci. Phil.* iv.

Icon. *Jour. Acad. N. S. Phil.* t.

Inhabits Florida.

*Obs.* This species is the type of Mr. Say and Ord's genus *Sigmodon*, which only differs from *Arvicola* in some slight variation in the form of the plates of the teeth.

548. 16. *A. Palustris* (Marsh Campagnol.) Body above dark grayish-brown; beneath pale lead-coloured; snout rather elongated, reddish-brown at its extremity; ears moderately long, slightly edged with hair; tail short, slightly hairy.

*Arvicola Palustris*, *Harlan, Faun. Amer.* 136. *Arvicola Riparius*, *Ord. Jour. Acad. Sci. Phil.* iv.

Icon. —

Inhabits the shores of the Delaware, living on the seed of the wild rice.

549. 17. *A. Pennsylvanica* (Pennsylvanian Campagnol.) Fur above brownish-fawn; beneath grayish-white; eyes very small; ears short and round.

*Arvicola Pennsylvanica*, *Ord. Guthrie's Geogr.* Myonotes *Pratensis*, *Raffinesque.* Campagnol of Pennsylvania, *Warden's Descrip. Unit. States*, v. 625.

Icon. *Wilson. Ornith.* vi. t. 50, f. 3.

Inhabits Pennsylvania.

*Obs.* Perhaps a variety of *A. Xanthognatus*, or the common species.

550. 18. *A. Astrachanensis* (Astracan Arvicola.) Yellow above; ashy underneath. Length four inches; tail one.

*Mus Astrachanensis*, *Erzleb. Syst.* 493. *Arvicola Astrachanensis*, *Desm.* 485. Maus-gottung, *S. G. Gmel. Rei.* II. 173.

Icon. *Gm. l. c.* tab. 11.

Inhabits the vicinity of Astracan.

551. 19. *A. Floridanus* (Florida Campagnol.) Lead colour, mixed with black on the dorsal line; yellowish on the flanks; ears large and membranous; fur very soft and fine; tail little more than half the length of the body. About eight inches long.

*Mus Floridanus*, *Ord. Nouv. Bull. de la Société Philomatique.* 1818. *Arvicola Floridanus*, *Harlan, Faun. Amer.* 142. *Neotoma Floridana*, *Say et Ord. Jour. Acad. N.S. Phil.* iv.

Icon. *Jour. Acad. N. S. Phil.* t.

Inhabits Florida.

*Obs.* This is the type of the Genus *Neotoma* lately established by Messrs. Say and Ord, which differs from *Arvicola* in the teeth being furnished with roots.

The Guangué of Molina, 281 (*Mus Cyanus*, *Gmel.* 132, the Sky-coloured Rat of Pennant, *Quad.* 183), blue above

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and white underneath, and the *Mus Microuros* of Erxleben, Syst. Mam. 403, are referred conditionally by M. Desmarest to the *Arvicolæ*, as are also, by the same writer, the *Lemmus Vittatus*, the *Lemmus Talpoides*, and the *Lemmus Novaboracensis* of Rafinesque, Annals of Nature, Nov. 1820, Nos. 9, 10, and 11.

**LEMMAUS.** *Incisives*  $\frac{3}{3}$ ; *canines*,  $\frac{2}{2}$ ; *cheek-teeth*  $\frac{3}{3}$ . This sub-genus differs from the preceding only in the character of the fore-feet, which, in some species, have five, and in others four toes; but the nails are fitted for digging in all, whence Illiger named them *Georychus*, or *Diggers*.

552. 1. *Lemmus Norvegicus* (the Lemming.) Reddish-yellow, black, and tawny, irregularly spotted or clouded; five toes on the fore-feet; thumb-nail large and strong. Length of body five or six inches, of the tail about half an inch.

*Mus Norvegicus*, Ray. Syn. 227. *Cuniculus Norvegicus*, Briss. Quad. 100. *Mus Lemmus*, Lin. Syst. Nat. 80. *Glis Lemmus*, Erxl. 371. *Lemmus Norvegicus*, Desm. 287.

Le Lemming, Buff. Hist. Nat. t. 13: Lemmar vel Lemmus, Olaus Magnus de Gent. Septent. 358.

Icon. Pallas, Glires, tab. 12, A. Schreber, 195. Ency. Méthod. t. 67, f. 6.

Var. a. One-fourth less than the other; dark above, white underneath, with a lighter band passing from the nose to each ear; tail short. Pallas, Glires, tab. 12, B. Inhabits Lapland.

553. 2. *L. Aspalax* (The Zokor Lemming.) Body reddish-gray; tail short; fore-feet pentadactylous; the three intermediate nails very long and arched; eyes very small.

*Mus Aspalax*, Pallas, Glires, 165.

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Le Zokor, *Vicq. d'Azyr. Syst. des Anim. t. II. 585.* Daurian Rat, *Pen. Quad. 216.*

Icon. *Pallas, l. c. t. 10. Schreb. t. 205.*

Inhabits the Altaic mountains and the vicinity of Lake Baikal.

554. 3. *L. Lagurus* (Hare-tailed Lemmus.) Ashy-gray, with a black dorsal line and no collar; fore-feet with five toes; nails not very strong, that of the thumb short and round; tail very short; ears moderate.

*Mus Lagurus, Pallas, Glires, 210. Glis Lagurus, Erxleb. Syst. Mam. 375. Lemmus Lagurus, Desm. Ency. Mam. sp. 455.*

Hare-tailed Rat, *Pen. Quad. 202.* - Le Lagure, *Vicq. d'Azyr. Syst. des Anim. II. 363.*

Icon. *Pallas, l. c. tab. 13, A. Schreb. tab. 193.*

Inhabits about the river Irtysh, in Siberia, and the Deserts of Tartary.

555: 4. *L. Talpinus* (Talpine Lemming.) Dusky or gray-brown above, whitish underneath; fore-feet with five toes, armed with moderate digging claws; tail very short; eyes small.

*Mus Talpinus, Pallas, Glires, 176. Spalax Minor, Erxleb. Syst. Mam. 377. Lemmus Talpinus, Desm. Ency. Mam. 288.*

Le Sukerkan, *Vicq. d'Azyr. Syst. des Anim. 490.*

Icon. *Pallas, l. c. tab. 11, A.*

Inhabits temperate parts of Russia and Western Siberia.

Var. A. Of an uniform black colour.

556. 5. *L. Hudsonius* (the Hudson's Bay Lemming.) Cinnereous, tinged with tawny on the back, with a dusky stripe down the middle; belly pale ash; four toes, and the rudi-

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ment of a thumb on the fore-feet; the two middle nails very large, and apparently double or divided; tail very short.

*Mus Hudsonius*, *Pallas, Glires*, 208. *Lemmus Hudsonius*, *Desmarest, Mam. sp.* 453.

Hudson's Bay Rat, *Pen. Quad.* 201.

Icon. *Pallas, l. c. tab. 26, fig. A, B, and C.* *Schreb.* 194.

Inhabits Labrador, Canada. *Mus. Brit.*

557. 6. *L. Torquatus* (Ringed Lemming.) Ferruginous, with a black dorsal line, and a white collar, imperfect underneath; ears very short; five toes before; nails moderate, that of the thumb short and rounded.

*Mus Torquatus*, *Pallas, Glires*, 206. *Lemmus Torquatus*, *Desm. Ency. Mam. sp.* 454.

Ringed Rat, *Pen. Quad.* 201. Le Collier, *Vicq. d'Åzyr. Syst. des Anim. t. II.* 368.

Icon. *Pallas, l. c. pl. 11, B.* *Schreb.* 194.

Inhabits the vicinity of the Oby, in Siberia.

558. 7. *L. Terrestris* (Land Lemming.) Blackish-gray, slightly variegated with yellow; paler beneath; tail black.

*Mus Amphibius Terrestris*, *Lin. Syst. Nat.* 82. *Lemmus Terrestris*, *F. Cuv.*

Icon. *F. Cuv. Mam. Lithog.*

Inhabits Europe.

ECHIMYS\*. Geoff. *Incisive teeth*  $\frac{3}{3}$ ; *canines*  $\frac{2}{2}$ ; *cheek-teeth*  $\frac{4}{4}$  = 20. *Head long; eyes large; ears shortish; no cheek-pouches; four toes, and the vestige of a thumb on the fore-feet, five on those behind; tail long, and generally scaly; back covered with shortish spines, more or less abundant.*

\* This word (Spiny Rats) is equally applicable to a few species of the Rats proper, not included in this subgenus.

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559. 1. *E. Chrysurus* (Gilt-tailed Echimys.) Brown-red, head deep brown, with a narrow white band down the middle, white underneath; tail longer than the body, black, with the posterior half yellowish or white, woolly.

*Myoxus Chrysurus*, *Bodd. Elench.* 122. *Histrix Chrysurus*, *Schreb. Echimys Cristatus*, *Desmarest, Ency. Méthod. Mammalogie*, p. 291. *Loncheres Chrysueros*, *Lichtenstein, Tr. Acad. Berl.* 1818.

Le Lerot à queue dorée, *Buff. Sup.* VII. 283. Gilt-tailed Dormouse, *Pen. Quad.* 162.

Icon. *Buff. l. c. tab.* 72. *Ency. Méthod. t.* 78, f. 4.

Inhabits Surinam.

560. 2. *E. Rufus* (Red Echimys.) Fur dark brown, mixed with red above, and white beneath. Length about eight inches; tail not quite half that length. Males larger than the females.

*Loncheres Rufa*, *Lichtenstein, Tr. Acad. Berl.* *Echimys Spinosus*, *Desmarest, Ency. Méthod. Mammalogie*, 291.

Spiny Rat, or first Rat of *d'Azara, Quad. du Paraguay*, 73. *Echimys Roux*, *Cuv. Règn. Anim.* 175. Angouya-y-bigoni of Paraguay.

Icon. *D'Azara's Voyage*, pl. 13.

Inhabits South America.

M. Geoffroy distinguishes the following as species.

561. 3. *E. Dactylinus* (Long-toed Echimys.) Fur of the back deep brown, mixed with gray and yellow, red on the flanks; two middle toes of anterior feet much longer than the rest; tail longer than the body.

*Echimys Dactylinus*, *Geaff. Nouv. Dict. d'Hist. Nat. t.* 10, 57. *Loncheres Myosuros?* *Lichtenstein, Trans. Acad. Berl.* 1818, 192.

Icon. *Lichtenstein, l. c. t.* 1, f. 2.

Inhabits South America.

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562. 4. *E. Hispidus*. (the Rough-haired Echimys.) Brown-red; lighter underneath; head reddish; tail as long as the body; scaly; hairs of the back very rough. About seven or eight inches long.

*Echimys Hispidus*. *Geoff. Nouv. Dict. d'Hist. Nat.* x. 58. Loncheres Paleacea, *Lichtenstein, Tr. Acad. Ber.* 1818. 191.

Icon. *Lichtenstein, l. c. t. 1. f. 1.*

Inhabits South America.

563. 5. *E. Didelphoides*. Brown on the back; lighter on the flanks; yellowish underneath; tail as long as the body; the tip, and for about one-seventh of its length, scaly; the rest hairy.

*Echimys Didelphoides*, *Geoff. Nouv. Dict. d'Hist. Nat.* 10. 58.

Inhabits America.

564. 6. *E. Cayennensis* (Cayenne Echimys.) Red, passing into brown, toward the middle of the back; belly white; hind-feet with long tarsi, and with the three middle toes of equal length.

*Echimys Cayennensis*, *Geoff. Coll. du Mus.*

Inhabits South America.

565. 7. *E. Setosus* (Bristly Echimys.) Fur red, soft, and but little intermixed with spines; under-part white; end of the feet white; tail rather longer than the body; posterior tarsi long.

*Echimys Setosus*, *Nouv. Dict. d'Hist. Nat. t. 10., pa. 59*, from Geoffroy.

Inhabits South America.

*MYOXUS*, (Dormice.) *Incisors*,  $\frac{3}{3}$ ; *canines*,  $\frac{0}{0}$ ; *cheek-teeth*,  $\frac{14}{14}$  = 20, divided by transverse bands; *eyes large and*

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*prominent; ears large, round; long mustachios; no cheek-pouches; fore-feet with four toes, and the rudiment of a thumb; posterior with five; tail long, more or less villose; fur soft. No cæcum, or large intestines.*

566. 1. *M. Glis* (the Fat Dormouse.) Gray-brown-ashy above, whitish underneath, with brown round the eyes; tail very villose its whole length; about six inches long.

*Glis*, *Brisson*, *Règne Anim.* 113. *Sciurus Glis*, *Lin.* 12 ed. *Mus Glis*, *Pallas*, *Glîres*, 88. *Sciurus Epilepticus*, *Klein*, *Quad.* 54. *Myoxus Glis*, *Gmelin*.

*Loir*, *Buff.* VIII. Fat Dormouse, *Pen. Quad.* II. 159.

*Icon. Buff. l. c. pl.* 24. *Schreber tab.* 22. *Ency. Méth.* t. 78. f. 1.

Inhabits Southern parts of Europe.

*Mus Brit.*

*Note.* According to the Baron Cuvier, the *Myoxus Dryas* of *Gmelin*, *Schreb. t.* 225. B. is only a variety of this species.

567. 2. *M. Nitela* (Garden Dormouse.) Fur gray-brown above, white underneath; black round the eyes to the shoulders; tail tufted, black. with the tuft white.

*Mus Avellanarum Major*, *Ray.* *Mus Quercinus*, *Lin.* *Mus Nitidula*, *Pallas*, *Glîres*, t. 88. *Myoxus Nitela*, *Gm.* *Sciurus Quercinus*, *Erzleb.*

Greater Dormouse, or Sleeper, *Ray*, *Quad.* 219. Garden Dormouse, *Pen. Quad.* II. 159. *Lerot*, *Buff.* VIII. *tab.* 25.

*Icon. Buff. l. c. tab.* 24. *Ency. Méth.* t. 78. f. 3.

Inhabits the temperate parts of Europe.

*Mus Brit.*

568. 3. *M. Avellanarius* (Common Dormouse.) Brownish yellow above, white underneath; hairs of the tail disposed like a feather; tail as long as the body, and flattened horizontally.

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*Mus Avellanarius Minor*, Ray. *Mus Avellanarius*, Lin.  
*Sciurus Avellanarius*, Erxleb. *Myoxus Muscardinus*, Gm.  
*Muscardin*, Buff. Croque-noix, Brisson, *Rég. Anim.*  
162. Dormouse, or Sleeper, Ray, *Quad.* 220.

Icon. *Buff. l. c. tab.* 26. *Schreb.* 227. *Ency. Méth.*  
t. 70. f. 5.

Inhabits Europe, including England.

*Mus Brit.*

Var. b. *Lalandii*. Twice the size of the Common Dormouse.

Inhabits Cape of Good Hope. Perhaps the same as *M. Africanus*.

569. 4. *M. Murinus* (Murine Dormouse.) Gray, rather paler beneath, and some of the hairs white, especially under the belly; tail as long as the body, flattened horizontally, and covered with two-rowed hairs.

*Myoxus Murinus*, *Desm. Supp.* 544. *Myoxus Compei*, *Cuv. Dict. Sci. Nat.* xxvii.

Icon. *F. Cuv. Mam. Lithog. n.* 17. t. 4.

Inhabits Cape of Good Hope.

570. 5. *M. Africanus* (African Dormouse.) Fur above pale ferrugineous, beneath whitish, with a white line above each eye; head flat; nose blunt; upper lip cut; tail moderate, black in the middle, gray on the sides; eyes large, black; whiskers long; ears very short.

*Myoxus Africanus*, *Shaw, Zool.* II. 172.

Icon. — ?.

Inhabits Africa.

The Dégu of Molina's *Chill*, 269, (*Sciurus Dégu* of Gmelin, and Chilian Squirrel of Shaw,) appears to be an *Arvicola*. M. Desmarest suggests that the *Musculus Fru-*

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*giborus* and *Musculus Dichrurus* of Rafinesque belong, probably, to this sub-genus.

**HYDROMYS.** Geoff. *Incisive teeth*  $\frac{3}{3}$ ; *canine*  $\frac{3}{3}$ ; *cheek-teeth*  $\frac{3}{3}=12$ ; *tops of the cheek-teeth flat, furnished with enamelled ridges, in the shape of the figure 8, with two excavations corresponding with the spaces in that figure; ears small and round; pentadactylous, but the thumb of the fore-feet extremely small; hind-feet palmated; tail as long as the body, cylindrical, but pointed at the end, and covered with thick hair.*

571. 1. *H. Leucogaster*, (the White-bellied Hydromys.) Brown above, white underneath; rather more than a foot in length.

*Hydromys Leucogaster*, Geoff. *Ann. Mus.* vi.

Icon. Geoff. *l. c. tab.* 36. *fig. B, C, D. Ency. Méthod. Supp. t.* 10. *f.* 3.

Inhabits Van Dieman's Land.

572. 2. *H. Chrysogaster* (the Yellow-bellied Hydromys.) Red-brown above, orange-yellow underneath.

*Hydromys Chrysogaster*, Geoff. *Ann. Mus.* vi. 86.

Icon. Geoff. *l. c. pl.* 36.

Inhabits Van Dieman's Land.

*Obs.* This and the former are the only true *Hydromys*; they are peculiar to *Australasia*.

Whether the above two constitute more than varieties of one species is doubtful.

573. 3. *H. Coypus* (the Coypus or Racoonda.) Reddish-brown on the back; red on the flanks, and light-brown on the belly; fur soft and downy, except on the tail. About two feet long; tail eighteen inches.

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*Mus Coypus*, Gmelin. *Hydromys Coypus*, Geoff. *Ann. Mus.* vi. 90. *Myopotamus Canariensis*, t. 167, from Commerson MSS.

Carpon, *Molina Chili*. Quoeuya, d'Azara, *Paraguay*, II. 5.

Icon. *Geoffroy*, l. c. f. 35.

Inhabits parts of South America. *Mus. Brooks*.

*Obs.* Specimens are found which vary considerably in colour.

This is the type of M. F. Cuvier's genus *Myopotamus*, which has been adopted by Desmarest, and all modern authors. The genus was first proposed by Commerson. It is peculiar to South America, and very nearly allied to the Beaver.

The fur of the animal is known to the furriers, by the name of *Racoonda*, and is used in the place of Beaver-fur to make hats.

*Mus.* Incisors  $\frac{3}{3}$ ; canines,  $\frac{0}{0}$ ; cheek-teeth,  $\frac{3}{3}$  = 16; cheek-teeth furnished with tubercles; ears oblong, or round, nearly naked, without cheek-pouches; anterior feet with four toes, and a wart, covered with an obtuse nail, in the place of a thumb; posterior feet pentadactylous; tail long, naked, and scaly; fur, with a few long scattered hairs, extending beyond the rest, which, in some species, become spines, like those on the *Echymys*.

\* Spineless Rats of the Old-Continent.

574. 1. *M. Giganteus* (the Malabar Rat.) Dark brown on the back, gray on the belly; feet black; body above a foot long.

*Mus Giganteus*, Hardwick, *Lin. Trans.* t. vii. *Mus Malabaricus*, Pen. *Quad.* vi. n. 377.

Icon. *Hardwick*, l. c. tab. 8.

Inhabits the Coasts of Malabar and Coromandel, and in the Mysore and Bengal.

The *Mus Indicus* of M. Geoffroy, *Catal. de la Collect. du Mus.* appears greatly assimilated to this species.

575. 2. *Mus Javanus* (Javanese Mouse.) Fur above red-brown; end of the legs white; tail shorter than the body; feet not webbed.

*Mus Javanus*, Herman, *Obs. Zool.* 63. *Mus Sumatrensis*, Raff. *Lin. Trans.* XIII.

Icon. —

Inhabits Java.

576. 3. *M. Caraco* (Caraco Rat.) Fur mixed gray and reddish, deeper on the back than on the sides; paws and belly whitish; tail rather more than half the length of the body; feet semi-palmate; length about seven inches.

*Mus Caraco*, Pallas, *Glires*, 335. Pennant, *Quad.*

Icon. Pallas, *l. c. tab.* 23. *Ency. Méthod.* t. 67. f. 8. Schreb. t. 177.

Inhabits eastern Siberia.

577. 4. *M. Decumanus* (Norway Rat.) Gray-brown above, dirty white underneath; tail nearly as long as the body; feet of a dirty flesh-colour, not webbed. Body nine inches long.

*Mus Sylvestris* and *Mus Norvegicus*, Brisson, *Règn. Anim.* 170. c. 173. *Mus Decumanus*, Pallas, *Glires*, 91. *Mus Griseus*, Pen. *Syn. Quad.* 300.

Brown Rat, Pen. *Quad.* 178. Surmulot, *Buff.* VIII. Le Pone, *Buff.* xv?

Icon. Schreb. *tab.* 178. *Buff. l. c. tab.* 27. *Ency. Méthod.* t. 67. f. 9.

Habitat. Originally Persia or India, but the species now spread to all parts of the civilized world.

SPECIES OF MAMMALIA.

578. 5. *M. Rattus* (the Black Rat.) Black above, deep ashy underneath; tail rather longer than the body; about seven or eight inches long.

*Mus Rattus*, *Lin. Sys. Nat.* 1. *Mus Domesticus Major*, *Ray, Syn. Quad.* 217. *Lin. Syn. Nat. ed.* 2.

Black Rat, or Common Rat.

Icon. *Schreb.* 179. *Buff. t.* 7. *tab.* 36. *Ency. Méthod. t.* 67. *f.* 4.

Habitat. Originally Persia or India, but now spread to all parts of the civilized world; destroyed by the Norway Rat, and, consequently, now becoming rare in England.

579. 6. *M. Alexandrinus* (Alexandrian Rat.) Reddish-gray above, ashy beneath; tail one-fourth part longer than the body; feet not webbed.

*Mus Alexandrinus*, *Geoff. Egypt.*

Icon. *Geoff. l. c. pl.* 5. *f.* 1.

Inhabits the vicinity of Alexandria in Egypt.

580. 7. *Mus Indicus* (Indian Rat.) Fur reddish-gray above, and gray beneath; legs reddish-gray; tail a little shorter than the body; feet not webbed.

*Mus Indicus*, *Geoff. Cat. Mus. Par. Desm.* vi. 299.

Icon. —

Inhabits Pondicherry.

581. 8. *M. Sylvaticus* (Field Mouse.) Reddish-gray above, white underneath; tail shorter than the body, which is nearly five inches long.

*Mus Agrestis Major*, *Gesner.* *Mus Domesticus Medius*, *Ray.* *Mus Campestris Major*, *Briss. Règ. Anim.* 171. *Mus Sylvaticus*, *Lin.*

Mulot, *Buff.* vii.

Icon. Schreb. tab. 180. Buff. l. c. pl. 41. Ency. Méthod.  
t. 68. f. B.

Inhabits all Europe. Brit. Mus.

582. 9. *M. Campestris* (Field Mouse.) Ears short,  
rounded; fur yellow-gray above, white beneath.

Mus Campestris, Desm. Mam. Supp. 453.

Petit Mulot, or Mulot des Champs, Buff. Hist. Nat. vii.

Icon. Cuv. Mam. Lithog.

Inhabits France.

583. 10. *M. Musculus* (the Mouse.) Dusky-gray above,  
ashy underneath; tail about as long as the body, which is  
nearly four inches long.

Mus, Aristotle, Hist. of Animals. l. c. 2. Mus Domes-  
ticus Vulgaris, Ray, Synop. 218. Mus Musculus, Lin. Syst.  
83. Mus Sorex, Brisson, Règne Anim. 169.

Icon. Schreb. 181. Buff. Hist. Nat. vii. tab. 39. and  
Sup. viii. tab. 20.

Inhabits all Europe, the Colonies of Europeans, and  
most parts of the world.

It varies, white, black, and black and gray and white,  
mixed.

584. 11. *M. Messorius* (Harvest Mouse.) Mouse-gray,  
mixed with yellowish above; belly and feet white; tail a  
little shorter than the body, which is but little more than  
two inches long.

Mus Messorius, Shaw, Zool. vi. 62.

Harvest Mouse, Pen. Quod. ii. 384.

Icon. Shaw, Zool. ii. p. 1. frontispiece.

Inhabits England, observed in Hampshire Mus. Brit.

Var.  $\beta$ . Black-gray.

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*Mus Pendulinus*, *Herman, Obs. Zool.* 61.

Inhabits Alsace and Germany.

585. 12. *M. Minutus* (Minute Mouse.) Fur ferruginous above, whitish underneath; muzzle slightly elongated; tail rather shorter than the body; length under three inches.

*Mus Minutus*, *Pall. Glires*, 345. *Mus Parvulus*, *Herman, Obs. Zool.* 64?

Rat Fauve, *Desm. Nouv. Dict. d'Hist. Nat.* t. 29. 60.

Icon. *Pallas, l. c. pl. 2A, B.*

Inhabits Russia generally.

586. 13. *M. Agrarius* (Sitnic Mouse.) Fur reddish-gray above, with a narrow black dorsal line; tail about half the length of the body; about three inches long.

*Mus Agrarius*, *Pallas, Glires*, 341.

Rat Sitnic, *Vicq. d'Azyr. Syst. des Anim.* II. 455. Rat à bande noire, *Ency. Méthod.*

Icon. *Pallas, l. c. pl. 2A, A. Schreb. tab. 182. Ency. Méthod. t. 67. f. 10.*

Inhabits Northern Germany, Russia, and parts of Siberia.

587. 14. *M. ? Subtilis* (Subtle Mouse.) Yellow or ashy above, with a black dorsal line; ears folded; tail rather longer than the body, about three inches long.

*Mus Subtilis*, *Pallas, Itin.* VI. A. 70. N. 11. A. B.

Icon. *Pallas, Glires, pl. 22. f. 1, and f. 2. Schreb. tab. 284. f. 1. c. 2. Ency. Méthod. t. 68. f. 2 and 5.*

Inhabits Tartary and Siberia.

Var. *a. Vagus*. Ground colour of the fur gray; tail black.

*Mus Vagus*, *Pallas, Glir.* 327. *Sikistan, Pallas, l.*

Icon. *Pallas, t. 22. f. 2.*

SYNOPSIS OF THE

Var.  $\beta$ . *Betulinus*. Ground colour of the fur yellow-gray, tail brown above, gray beneath.

*Mus Betulinus*, *Pallas, Ghr.* 332.

Icon. *Pallas, l. c. t. 22. f. 1.*

These animals live in trees, which they climb with ease, by the assistance of their large hands. They have very great analogy with the Dormice, and, like them, want the gall-bladder, but differ from them in having a cæcum. Mr. Gray has formed them into a distinct genus, under the name of *Sicista*.

588. 15. *M. ? Striatus* (the Striated Mouse.) Red-gray above, marked with several longitudinal lines of little white spots; tail as long as the body, about as big as a Mouse.

*Mus Orientalis*, *Seba, Thes.* II. 22. *Mus Striatus*, *Lin. Mus. Adolph. Frider.* I. 10. Striated Mouse, *Shaw, Zool.* VI.

Icon. *Seba, l. c. f. 2.* *Shaw, Zool.* VI. t. 133. *Ency. Méthod.* t. 68. f. 6.

Inhabits the East Indies, according to Seba.

*Obs.* This has been considered by some as the young of *Sciurus Getulus*, but apparently without foundation.

589. 16. *M. ? Barbarus* (Barbary Mouse.) Fur above brown, marked with ten longitudinal whitish lines; three toes only on the anterior feet.

*Mus Barbarus*, *Lin. Syst. Nat. ed.* 12.

Icon. —

Inhabits Africa.

590. 17. *M. Soricinus* (Soricine Mouse.) Fur yellowish-gray above, whitish underneath; muzzle elongated; tail as long as the body; ears orbicular, hairy; length about three inches.

*Mus Soricinus*, *Herman, Obs. Zool.* 57.

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Icon. *Schreb. tab. 18. B. Shaw, Zool. II. t. 133. Ency. Méthod. t. 68. f. 4.*

Inhabits the vicinity of Strasbourg.

591. 18. *M. Frugivorus* (Frugivorous Mouse.) Fur reddish brown, with scattered long brown hairs above; beneath white; ears naked, rounded; tail as long as the body, brown ringed, ciliated.

*Musculus Frugivorus, Raff. Précis de Découvert. 5.*

Inhabits Sicily, living on trees.

592. 19. *M. Dichrurus* (Two-coloured Tailed Rat.) Fur gray, varied with brown above and on the sides; head with a brown band; belly whitish; tail as long as the body, ringed, ciliated, above brown, beneath white, rather squared.

*Musculus Dichrurus, Raff. Précis de Découv. 5.*

Inhabits Sicily, living in fields.

593. 20. *Mus Setifer* (Bristle-bearing Rat.) Fur bristly, blackish-brown beneath, especially the hinder part; gray back; with nearly erect rigid bristles; ears large, rounded, nearly naked; tail long.

*Mus Setifer, Horsf. Zool. Java. Tckus Urrok, Javanese.*

Icon. *Horsf. l. c. t.*

Inhabits Java.

Dr. Hamilton has described and figured a somewhat similar species, under the name of *Mus Icria*.

594. 21. *M. Islandicus* (Iceland Rat.) Fur of the back black; red-gray spotted with yellow on the sides; tail nearly naked, with scales, a little longer than the body.

SYNOPSIS OF THE

*Mus Islandicus*, *Thienemann, Natur Bemerk.* 1.

Icon. *Thienemann, l. c. t.* 22.

Inhabits North of Europe.

595. 22. *M. Donovanii* (Donovan's Rat.) Fur blackish-gray, varied with brown; back with three pale dorsal bands; tail moderate, rather hairy.

*Rattus Donovanii*, *Donovan, Nat. Repos.*

Icon. *Donovan, l. c. t.* 35.

Inhabits Cape of Good Hope.

\* \* *American Spineless Rats.*

The dentition of the following American species of d'Azara has not been ascertained with certainty; and it is only on the authority of external characters, therefore, that they are placed in this subdivision.

596. 23. *M. Angouya* (Angouya Rat.) Yellow-brown above, whitish beneath; tail rather longer than the body; ears rounded, moderate.

Angouya Rat, or third Rat of d'Azara, *Quad. of Paraguay*. *Mus Braziliensis*, *Geoff. Collect. du Mus.?* *Mus Caugouya*, *Desm.* 305.

Icon. —

Inhabits Paraguay.

597. 24. *M. Rufus* (Red Rat of d'Azara.) Yellowish-red, darker on the head and back; belly yellowish; tail more than half as long as the body; about six inches in length.

Red Rat, or fifth Rat of d'Azara, *Quad. of Paraguay*.

Icon. —

Inhabits Paraguay.

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598. 25. *M. Cephalotes* (Great-headed Rat.) Head very large, muzzle short; brown above, lighter on the sides, whitish underneath; tail as long as the body.

*Mus Cephalotes*, *Desmarest, Nouv. Dict. d'Hist. Nat.* 305.

Great-headed Rat, or second Rat of *d'Azara, Quad. of Paraguay.*

Icon. —

Inhabits Paraguay.

599. 26. *M. Auritus* (Long-eared Rat.) Head thick; ears long; mouse-colour, lighter underneath; tail shorter than the body; about five inches long.

*Mus Auritus*, *Desmarest, Nouv. Dict. d'Hist. Nat.* 305.

Long-eared, or fourth Rat of *d'Azara, Quad. of Paraguay.*

Icon. —

Inhabits South of Buenos Ayres.

600. 27. *M. Nigripes* (Black-footed Rat.) Head thick; ears short and round; yellow-brown above, whitish underneath; paws deep black; tail shorter than the body; about four inches long.

*Mus Nigripes*, *Desmarest, Nouv. Dict. d'Hist. Nat.* 305.

Black-footed Rat, or sixth Rat of *d'Azara, Quad. of Paraguay.*

Icon. —

Inhabits Paraguay.

601. 28. *M. Laucha* (Laucha Rat.) Head moderate; muzzle pointed; lead colour above, whitish underneath; tail rather shorter than the body; about three inches long.

*Mus Laucha*, *Desmarest, Nouv. Dict. d'Hist. Nat.* 305.

Laucha Rat, or seventh Rat of *d'Azara, Quad. of Paraguay.*

## SYNOPSIS OF THE

Icon. —

Inhabits Buenos Ayres.

The three following are referred by their describers to this division of the Glires, but their dentition is not ascertained.

602. 29. *M. Leucopus* (White-footed Mouse.) Brownish-yellow above, white underneath, head yellow; ears large; tail as long as the body, pale brown above, gray underneath; the paws white; about five inches long.

*Raffinesque, Journey to the Westward of the United States, and American Monthly Mag. t. 3, 444.*

603. 30. *M. Nigricans* (Wood Rat of Raffinesque.) Black above; gray on the belly; tail black; longer than the body; about eight inches long.

*Mus Nigricans, Black, or Wood Rat, Raffinesque, Journey to the Westward of the United States, and American Monthly Mag. Oct. 1818.*

### \* \* \* Spiny Rats.

604. 31. *M. Perchal* (Perchal Rat.) Reddish-brown above, with spiny hairs intermixed; grayish underneath; tail not so long as the body; about seventeen or eighteen inches long.

*Mus Perchal, Gmel. Echimys Perchal, Geoff.*

*Rat Perchal, Buff. Hist. Nat. Supp. t. i. 276.*

*Icon. Buff. l. c. pl. 69.*

Inhabits the town and vicinity of Pondicherry.

605. 32. *M.? Cahirinus*. (Egyptian Rat.) Ashy gray, deeper on the upper than on the under parts, composed of rough spiny hairs; tail as long as the body; about four inches long.

SPECIES OF MAMMALIA.

*Mus Cahirinus*, *Geoffroy, Collect. du Mus. Echimys, d'Egypte, Ejusdem, Egypt. partie d'Hist. Nat.*

Icon. *Geoffroy's Egypt. pl. 5. f. 2.*

Inhabits Egypt.

**CRICETUS.** Dentition like that of *Mus*; cheek pouches; body low on the legs; head thick; ears oval and round; toes like those of the *Mus*, or with five toes on the fore-feet.

606. 1. *C. Vulgaris* (the Common Hamster.) Grayish fawn-colour above; black underneath, with three large yellowish spots on each side, one white spot on the throat, and another under the chest.

*Mus Cricetus*, *Pallas, Glires*, 83. *Glis Cricetus*, *Erzleben*. *Glis Marmota Argentoratensis*, *Brisson, Quad.* 166.

Hamster, *Buff. t.* 13. Hamster Rat, *Pennant, Quad.* II. 206.

Icon. *Schreber, tab.* 198, A. *Buff. l. c. pl.* 14.

Inhabits the central and northern parts of Europe and Asia.

Var. a. Black, with a little white round the mouth, on the nose, edge of the ears, feet, and end of the tail.

607. 2. *C. Migratorius* (Yaik Hamster.) Ashy-gray above; white underneath; muzzle, round the nostrils, and feet, white; ears indented. About four inches long; tail less than an inch.

*Mus Accedula*, *Pallas, Glires, pa.* 74. *Mus Migratorius, ejusd. Voyage.* *Cricetus Migratorius, Desm.* 318.

Yaik Rat, *Pen.* II. 210. Le Hagri, *Vicq. d'Azyr. Syst. des Anim.* II. 395.

Icon. *Pallas, Glires, pl.* 18, A. *Schreber, tab.* 197. *Ency. Méthod.* 70, f. 2.

Inhabits the vicinity of the Yaik, in Siberia.

SYNOPSIS OF THE

608. 3. *C. Arenarius* (Sand Hamster.) Whitish ash-colour above ; pure white beneath ; feet and tail white ; ears round. About four inches long ; tail about an inch.

*Mus Arenarius*, *Pallas, Glires*, 86.

Sand Rat, *Pen. Quad.* II. 211. *Le Sablé, Vicq. d'Azyr. Syst. des Anim.* II. 407.

Icon. *Pallas, l. c. tab.* 16, *A. Ency. Méthod. t.* 70, *f.* 4.

Inhabits the sandy vicinity of the Irtisch, in Siberia.

609. 4. *C. Phæus* (Astracan Hamster.) Brownish ash-colour on the back and upper part of the tail, the under side of which is white, together with the under part of the body and internal sides of the limbs ; ears oval and large.

*Mus Phæus*, *Pallas, Glires*, 86. *Mus Alpinus*, *Hablitz, Gm. Voy.* 172.

Zaryzin Rat, *Pen. Quad.* II. 211. Astracan Mouse, *Shaw, Zool.* II. p. 2, 103. *Le Phé, Vicq. d'Azyr. Syst. des Anim.* 405.

Icon. *Schreb.* 200. *Pallas, Glires, tab.* 15. *A. Ency. Méthod. t.* 70, *f.* 2.

Inhabits the Deserts of Astracan, the temperate parts of Persia, &c.

610. 5. *C. Songarus* (Songar Hamster.) Ashy on the back, with a black dorsal line ; sides varied with white and brown ; belly white ; tail very short ; about three inches in length of body.

*Mus Songarus*, *Pallas, Glires*, 86. *Glis Æconomicus?* *Erzleben.*

Songar Rat, *Pen. Quad.* II. 212.

Icon. *Pallas, l. c. tab.* 16, *B. Schreber, tab.* 201. *Ency. Méthod. t.* 71, *f.* 1. *t.* 70, *f.* 5.

Inhabits Siberia.

SPECIES OF MAMMALIA.

611. 6. *C. Furunculus* (Baraba Hamster.) Ashy above with a black dorsal line ; belly and paws white. Body about four inches long ; tail one inch.

*Mus Furunculus*, *Pallas, Glïres*, 86, and *Mus Barabensis*, *ejusd. - Voyage*, II. 704. *Furunculus Myoides*, *Messerschmid, Mus. Petrop.* 343.

Baraba Rat, *Pen. Quad.* II. 213. *L'Orozo, Vicq. d'Azyr. Syst. des Anim.* II. 412.

Icon. *Pallas, Glïres*, tab. 15, *B. Schreber*, 202. *Ency. Méthod.* t. 71, f. 2.

Inhabits the sandy plains of Baraba.

612. 7. *C. Bursarius* (Canada Hamster.) Gray ; anterior feet pentadactylous, armed with long digging nails ; ears short ; body cylindrical ; about as big as the Norway Rat.

*Mus Bursarius*, *Lin. Trans.* v. 227. *Mus Saccatus*, *Mitchell, New York Medical Repository*, Jan. 1821. *Geomys Cinereus*, *Raffinesque, Amer. Monthly Mag.* 1817, 45.

Canada Rat, *Shaw's Zoology*, II. pl. 1, 100. Sand Rat, *Geoff.*

Icon. *Lin. Trans.* l. c. *Shaw*, I. t.

Inhabits Canada.

*Obs.* *Raffinesque* appropriates this to a distinct genus, *Geomys*, distinguished by the five toes on the fore-feet, and the subterranean habits. Its teeth are still uncertain, and its location consequently conditional. *Say* formed it into a genus, under the name of *Pseudotoma*.

613. 8. *C. Laniger* (the Chinchilla Hamster.) Gray and white, waved ; ears large and round ; tail short, furnished with longish stiff hairs ; fur of the body extremely soft and downy.

*Mus Laniger*, *Molina, Chili*, 283. *Cricetus Laniger*, *Geoff. Collect. du Mus.*

SYNOPSIS OF THE

Chinchilla, *Acosta, Nat. History of India, 199.*

Icon. —

Inhabits Chili, according to Molina, Peru, according to Acosta; and probably the whole chain of the Andes.

*Obs.* The teeth of this species are still unknown to Naturalists; and M. Geoffroy's location of it with the Hamsters is conditional.

614. 9. *C. Anomalus* (Anomalous Hamster.) Reddish-brown above; white underneath; some flat spines on the back; tail nearly as long as the body, nearly naked, scaly, and black.

*Mus Anomalus, Thompson, Trans. Lin. Soc. Cricetus Anomalus, Desmarest, Nouv. Dict. d'Hist. Nat. t. 14, 180.*

Icon. —

Inhabits the Isle of Trinity in the Gulf of Mexico.

*Obs.* Desmarest has proposed to consider this species as a new genus, under the name of *Heteromys*.

*DIPUS.* Incisors  $\frac{3}{4}$ , those below sharp-pointed; canines  $\frac{3}{3}$ ; cheek-teeth  $\frac{3}{3}$  or  $\frac{4}{4}$ , simple, with tuberculous crowns; eyes large; ears long, pointed; anterior feet short, with four toes, and tubercle with a nail in the place of a thumb; hind feet five or six times longer than those before, terminated by three or five toes, with one metatarsus for the three middle toes.

615. 1. *D. Sagitta* (the Jerboa.) Bright yellow above; white underneath; tail longer than the body, with a tuft at its extremity. About six inches long.

*Mus Ægyptius, Hasselquist. Mus Jaculus, Lin. Mus Sagitta, Pallas, Glires, 306. Dipus Gerboa, Gm.*

*Daman, Shaw, Travels in Barbary. Gerboa, Bruce's Travels, var. Gerbo ou Gerboise, Buff. Hist. Nat. Sup. t. vi.*

SPECIES OF MAMMALIA.

Icon. *Buff. l. c. pl. 39, and 40. Pallas, l. c. pl. 21.*

Inhabits Barbary, Egypt, and Western Asia.

616. 2. *D. Jaculus* (Siberian Jerboa.) Pale yellow above; white underneath; muzzle white, and a white stripe across the buttocks; five toes on the fore-feet, of which the lateral are very small. About seven inches long; tail nearly a foot.

*Mus Jaculus, Pallas, Glires, 275. Dipus Alagtaga, Oliv. Bull. Soc. Phil.*

Siberian Jerboa, *Pen. Quad. II. 166.*

Icon. *Pallas, l. c. tab. 20.*

Inhabits Deserts of Tartary, and probably a considerable part of South Western Asia.

617. 3. *D. Brachyurus* (Striped Jerboa.) Pale yellow, varied with brown above, and white underneath; a white stripe across the buttocks; muzzle white at the extremity, brown above; tail and limbs rather thick; ears short; hind feet with five toes, the three internal of equal length. Nearly five inches long; tail rather longer.

*Mus Jaculus, var. B. Pallas, Glires, 297. Dipus Brachyurus, Blainville. Desmarest, Nouv. Dict. d'Hist. Nat.*

Icon. —

Inhabits Eastern Tartary and Siberia.

618. 4. *D. Minutus* (Little Jerboa.) Pale yellowish-gray, varied with brown above, and white underneath; the extremities, and a transverse stripe on the buttocks, white; muzzle like the back; hinder feet pentadactylous, with the three intermediate nails equal in length. Length under five inches; tail rather longer.

*Dipus Jaculus, var. minor, Pallas, Glires, 296. Dipus Minimus, Blainville. Desmarest. Nouv. Dict. d'Hist. Nat.*

Icon. —

SYNOPSIS OF THE

Inhabits the shores of the Caspian.

*Obs.* Pallas found but three cheek-teeth on each side in the upper jaw in this species; if this were not accidental, it should constitute a specific character.

619. 5. *D. Maximus* (Great Jerboa.) Bright gray above; a black line over each eye, uniting on the forehead; white underneath; four toes to the fore-feet, and three to those behind. About the size of a moderate Rabbit.

*Dipus Maximus*, Blainville. *Desmarest, Nouv. Dict. d'Hist. Nat.*

Icon. —.

Habitat uncertain.

*Obs.* We have inserted the several species considered as such by M. Desmarest, some of which, it will be seen, Dr. Pallas treats as varieties.

**GERBILLUS.** Desmarest. *Incisive teeth*  $\frac{3}{3}$ ; *canines*  $\frac{0}{0}$ ; *cheek-teeth*  $\frac{3}{3}$  = 16; *cheek-teeth tuberculous, the first with three, the second with two, and the third with one tubercle.* Bars moderate; fore-feet short, with four toes and the rudiment of a thumb; the hind legs long, or very long, terminated by five toes, with nails, each with a distinct metatarsus; tail long, covered with fur.

*Obs.* M. Desmarest separated a number of species, heretofore inserted in several different subdivisions of the Rodentia, into one genus, under the name Gerbillus, without, we believe, having examined the teeth of any of the animals he refers to it, except those of the Egyptian species. The Baron admits also the Indian species into Desmarest's genus; but of those then remaining, he says, that having examined the teeth of some of them, he finds some distinct, and others he refers to new groups.

Frederick Cuvier has restricted the genus, and gives the

character of the teeth in his work on the **Teeth of Quadrupeds**.

620. 1. *G. Tamaricinus* (Tamarisk Gerbil.) Yellowish-gray above, white underneath; tail about as long as the body, annulated gray and brown; body about seven inches long.

*Mus Tamaricinus*, *Pallas, Glires*, 322.

*Sciurus Tamaricinus*, *Erzleb.* *Dipus Tamaricinus*, *Gm.* *Myoxus Tamaricinus*, *Desmarest, Nouv. Dict. d'Hist. Nat. 1st ed.* *Gerbillus Tamaricinus*, *ejusd. 2d ed., et Encyc. Méthod. Art. Mammalogie, Sp.* 513.

Tamarisk Rat, *Pen. Quad.* II. 175. Tamarisk Jerboa, *Shaw, Zool.* II. p. 1. 191.

Icon. *Pallas, l. c. pl.* 19. *Schreb. tab.* 232.

Inhabits the vicinity of the Caspian.

621. 2. *G. Indicus* (Indian Gerbil.) Red-brown above, sprinkled with small brown spots, disposed in longitudinal lines; white underneath; tail a little longer than the body, brown, terminated by a tuft, about seven inches long.

Yerbua Indica, *Hardwicke, Trans. Lin. Soc. t.* VIII. 279.

Icon. *Nouv. Bull. Soc. Philom.* v. 35. 121. *pl.* 1. *f.* 1.

Inhabits Hindostan.

622. 3. *G. Meridianus*, (Torrid Gerbil.) Grayish-yellow above, white underneath, with a central line of red-brown; limbs white; about five inches long; tail between three and four.

*Mus Meridianus*, *Pallas, Glires*, 314.

Le Jird, *Vicq. d'Azyr. Syst. des. Anim. t.* II. 413.

Icon. *Pallas, l. c. pl.* 18, *B.*

Inhabits the deserts near the Volga.

SYNOPSIS OF THE

*Obs.* Considered by some authors as the *Mus Longipes* of Linnæus.

623. 4. *G. Ægyptius* (Egyptian Gerbil.) Upper part of the body bright yellow, under part pure white; tail a little longer than the body, brown, and terminated with a few long hairs; hind legs very long; about the size of a Mouse.

*Dipus Gerbillus*, *Olivier, Bull. de la Soc. Philom. n. 40. ejusd. Voyage dans l'Empire Ottom. t. III. 157.* *Mus Longipes*, *Lin. Dipus Pyramidum*, *Geoff. Gerbillus Ægyptius*, *Desmarest, Ency. Méthod. Mam. Sp. 516.*

*Icon. Oliv. Voy. dans l'Empire Ottom. pl. 28. f. A, B, C.*  
Inhabits the vicinity of Memphis and the Pyramids of Egypt.

624. 5. *G. Canadensis* (Canadian Gerbil.) Yellowish above, white underneath; ears short; tail almost denuded, rather longer than the body, without tuft at the end.

*Dipus Canadensis*, *Darvies, Lin. Trans. iv. 155.* *Gerbillus Daviesii*, *Rafinesque Précis. des Découvertes Simiologique, 14.*

*Icon. Lin. Trans. iv.*

Inhabits the vicinity of Quebec.

625. 7. *G. Labradorius* (Labrador Gerbil.) Fur brown above, beneath white, without a dividing line; toes four before, five behind; tail more than half the length of the body.

*Mus Labradorius*, *Sab. Append. Frank. Voy. 661.* *Gerbillus Labradorius*, *Harlan, Faun. Amer. 157.*

Inhabits Labrador.

**M. Rafinesque has named others as distinct species of**

the Gerbil; but in the present uncertain state of species belonging to this subdivision, we shall not enumerate them as species otherwise than by this notice. These are the *Gerbillus Soricinus*. Gray-brown, with a longitudinal red line on the flanks. *Gerbillus Megalops*. (*American Monthly Mag.* 1818, p. 446.) Black; tail longer than the body, terminated by a white tuft; eyes large and black; body three inches long. *Gerbillus Conurus*. (*Id.*) Uniformly yellow; eyes small; tail as long as the body, black, terminated by a yellow tuft. *Gerbillus Hudsonius*. *Dipus Gerbillus*, Zimmerman.

ASPALAX. Incisive-teeth,  $\frac{2}{3}$ , yellow, large, square at the top and bottom, those below twice the length of those above; canines,  $\frac{0}{0}$ ; cheek-teeth,  $\frac{3}{3}$ , with tuberculous crowns; body long, cylindrical; eyes very small, entirely covered by the skin; no external ears; paws short, pentadactylous; tail naked; fur short, and soft.

626. 1. *A. Typhlus* (the Spalax.) Fur blackish ash-colour at the base, reddish toward the point; head large, and thick, and the whole animal cylindrical; eyes merely rudimentary; about as big as a Rat.

*Mus Typhlus*, Pallas, *Glires*, 154.

*Spalax Microphthalmus*, *Guldenst.* *Spalax Major* et *Glis Zamui*, *Erzleb.* Ασπαλαξ or Mole of the Greeks.

Icon. Pallas, *l. c.* pl. 8. *Schreb. tab.* 206.

Inhabits Asia Minor, Syria, Mesopotamia, Persia, and Southern Russia.

Var. A. With large irregular white spots.

BATHYERGUS. Incisors,  $\frac{2}{2}$ ; canines,  $\frac{0}{0}$ ; cheek-teeth,  $\frac{4}{4}$ , or  $\frac{3}{3}$ , according to F. Cuvier, = 20. Incisors very long, large, and square; cheek-teeth slightly tuberculous, in-

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dented on the edges ; body thick and cylindrical ; head thick, muzzle truncated ; eyes small ; no external ears ; feet short ; toes five, with digging nails ; tail very short.

627. 1. *B. Maritimus* (the Coast Bathyergus.) Whitish gray ; tail flat, covered with rough hairs ; body above a foot long ; tail about three inches.

*Mus Maritimus*, *Gm.* *Bathyergus*, *Ill. Prod. Arctomys Africana*, *Lamark, Voy. de Thunberg.* i. 188. and ii. 475.

Taupe du Cap, *Lacaille, Journ.* 299. Grande Taupe du Cap, *Buff. Supp. t. vi.* Taupe des Dunes, *Allamand, Supp. t. v.* 24. Zand Mole, *Cape Colonists.*

Icon. *Buff. Supp. vi. tab. 38.* *Allamand, l. c. tab. 10.* *Lamark, l. c. t. ii. pl. 1.* *Schreber, tab. 204, B.*

Inhabits the Cape of Good Hope.

628. 2. *B. Capensis* (the Cape Bathyergus.) Brown, with white round each eye and ear, and on the top of the head, and end of the muzzle ; about six inches long.

*Mus Capensis*, *Pallas, Gires*, 172.

*Georychus*, *Illiger, Prod.*

Taupe du Cap de Bonne Esperance, *Buff. Supp. ii.*

Icon. *Pallas, l. c. pl. 7.* *Buff. l. c. tab. 36.* *Schreber, 204. Thunberg, t. ii. pl. 2.*

Inhabits the Cape of Good Hope.

*M. Desmarest* treats this as distinct, and not as a smaller variety ; and *Illiger* even refers this and the last to two genera.

*Raffinesque*, in the *Annals of Nature*, describes *Spalax Vittata*, which is yellow on the upper part, with three brown longitudinal bands, and white underneath ; about seven inches long, and refers it to this sub-genus.

629. 3. PEDETES. Incisors,  $\frac{3}{2}$  ; canines,  $\frac{3}{2}$  ; cheek-

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teeth,  $\frac{4}{4}$ ; lower incisors, cut obliquely, and not pointed; cheek-teeth formed, of two elliptical parts, united at their internal extremity, and separated above by a deep furrow; head short, large, and flat; muzzle obtuse, terminated by small nostrils at right angles; ears long, narrow, pointed; eyes large; no cheek-pouches; large whiskers; anterior feet with five toes, and long narrow digging nails; posterior feet with four toes, the external very small, the intermediate of the other three much the longest, the rest being equal, all furnished with thick strong nails; tail long, thick. An abdominal pouch in the females like that of the Didelphes, but not enclosing the teats.

630. 1. *P. Capensis* (Cape Pedetes.) Bright fulvous, varied with black on the upper part; white underneath, with a line of the same colour in the folds of the arms; legs brown; tail thin, reddish above, near the insertion, gray below, and black at the end.

*Yerbuia Capensis*, Sparman, *Acta. Stockholm.*, 1778, and *Travels in Africa*. Mus Cafer, Pallas, *Glires*, 87. *Dipus Cafer*, Gm. Gerboa Major, Allam. *Monog.* 1776. *Helamys Marmot*, *Helamys Cafer*, F. Cuvier, *Dict. des Sciences Nat.* t. 20, 344.

Cape Jerboa, Penn. II. Leaping Hare, *Cape Colonists*. Inhabits the Cape of Good Hope.

ARCTOMYS. Incisors,  $\frac{2}{2}$ ; canines,  $\frac{0}{0}$ ; cheek-teeth,  $\frac{4}{4}$  = 22. Incisors very strong; anterior surface rounded; cheek-teeth, with the upper surface furnished with ridges and tubercles; body thick and heavy; head large; eyes large; ears short; paws strong, anterior with four toes, and the rudiment of a thumb; the posterior with five toes; nails strong, compressed; tail generally short.

M. F. Cuvier has divided this genus into two, viz.

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I. *Arctomys*. *No cheek pouches. Habits social.*

631. 1. *A. Marmotta* (the Marmot.) Yellowish-gray, with an ashy tint on the head; top of the head, and end of the tail, black; under part yellowish-white; nearly eighteen inches long.

*Mus Alpinus*, *Pliny*, *lib.* VIII. 37. *Glis Marmotta*, *Klein. Quad.* 56. *Mus Marmotta*, *Lin. Sys. Nat.* 81. *Arctomys Marmotta*, *Gm.*

*Marmotte*, *Buff. Hist. Nat.* 8. *Alpine Marmot*, *Pen.* II. 128.

*Icon. Perrault, Hist. des Anim.* III. f. 7. *Schreb. tab.* 207. *Buff. l. c. pl.* 28.

Inhabits the Alps, Pyrenees, and the other high mountains of Europe and Asia.

632. 2. *A. Bobac* (the Bobac.) Yellowish-gray, with red tint near the head; under part of the body reddish; about eighteen inches long.

*Mus Arctomys*, *Pallas, Glires*, 97. *Glis Polonica*, *Brisson*. *Glis Marmotta*, *Erzleb.* *Arctomys Bobac*, *Gm.* *Mus Arctomys*, *Boddaert*. *Mus Marmotta*, *Forster, Phil. Trans.* 57.

*Bobak, ou Marmotte de Pologne*, *Buff. t.* XIII. 1.

*Icon. Pallas, l. c. tab.* 5, and 9. f. 1, 2, 3. *Buff. l. c. pl.* 18. *Schreb.* 209.

Inhabits Poland, and Northern Russia.

633. 3. *A. Monax* (Maryland Marmot.) Brown above, paler on the sides, and belly; muzzle bluish-gray and black; tail half as long as the body, black; nearly eighteen inches long.

*Mus Monax*, *Lin. Sys.* 81. *Glis Monax*, *Erzleb.* *Cuniculus Bahamensis*, *Catesby, Carolina*, II. 79.

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Maryland Marmot, *Pen. Quad.* II. 130. Monax, ou Marmotte de Canada, *Buff. Supp.* III. Wood-chuck, or Ground Hog of the United States.

Icon. *Schreb.* 208. *Buff. l. c. pl.* 28. *Catesby, pl.* 79.  
Inhabits North America.

634. 4. *A. Empetra* (Quebec Marmot.) Blackish-brown, dotted with white-red underneath; tail short, black at the end.

*Mus Empetra, Pallas, Glires,* 75. *Arctomys Empetra, Gmelin.*

Quebec Marmot, *Pen. Quad.* II. 130.

Icon. *Schreb. tab.* 210. *Pen. l. c. pl.* 74. f. 1;

Inhabits Canada, and the shores of Hudson's Bay.

635. 5. *A. Brachyura* (Short-tailed Marmot.) Cinereous brown above, light red beneath; tail flat, reddish, two-rowed, one-seventh the whole length.

*Anisonys Brachyura, Raffinesque, Amer. Mag.* VI. 45.

Burrowing Squirrel, *Lewis and Clarke, Exped.* VI. 173.

Icon. —

Inhabits Missouri.

636. 6. *A. Rufa* (Red Marmot.) Reddish-brown; fur short, thick, and silky; ears short, thin, and pointed, covered with hair.

*Arctomys Rufa, Harlan, Amer. Faun.* 308. *Anisonys Rufa, Raffinesque, Amer. Month. Mag.*

Sewellel, *Lewis and Clarke, Exped.* VI. 176.

Icon. —

Inhab. —

*Obs.* Raffinesque formed these two animals into a genus, under the name of *Anisonys*, the character of the nails being unequal; but Lewis and Clarke do not mention their being so.

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II. SPERMOPHILUS. *With large cheek-pouches. Habits solitary.*

637. 7. *A. Citillus* (the Soudlik.) Yellowish-brown, waved or spotted with white in transverse stripes; white underneath; with cheek-pouches; external ears scarcely visible.

*Mus Noricus*, ~~est~~ *Citillus*, *Agricola*, *An. Subter.* 485. *Mus Citillus*, *Pallas*, *Glires*, 549. *Mus Suslica*, *Guldens. Nouv. Can. Petrop.* XIV, 389. *Glis Citillus*, *Eracleb.* *Mus Marmota*, *Forster*, *Phil. Trans.* 57, 343.

*Zizel*, *Buff. t.* 15, 139. *Soudlik*, *ejusd. t.* 15, 144. *Jevraschka*, ou *Marmotte de Siberia*, *ejusd. Sup. t.* 3, 191. *Earless Marmot*, *Pen.* II. 135.

*Icon. Pallas*, *l. c. tab.* 21. *Guldens. l. c. tab.* 7. *Schreber*, *tab.* 211. *A. B.* *Buff. Sup.* III. *tab.* 31.

Inhabits parts of Germany, and Russia in Europe and Asia.

*Obs.* There are three varieties of this species, distinguished, 1st. by the wavy disposition of the colour of the back; 2dly, by white spots instead of waves; 3dly, uniform.

The following species discovered by our late intrepid navigators, seem referable to this division of pouched Marmots.

638. 8. *A. Franklinii* (Franklin's Marmot.) Head broad; ears small; snout very blunt; tail elongated; body variegated, fuscous.

*Arctomys Franklinii*, *Sabine*, *Lin. Trans.* XIII. 587.

*Icon. Lin. Trans.* XIII. *t.* 27.

Inhabits Canada.

639. 9. *A. Richardsonii* (Richardson Marmot.) Ears short; snout acute; tail moderate; body fuscous.

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*Arctomys Richardsonii*, Sabine, *Lin. Trans.* XIII. 589.

Leon. *Lin. Trans.* XIII. t. 28.

Inhabits Canada.

640. 10. *A. Parryii* (Parry's Marmot.) Snout very blunt; ears very short; tail elongate, tip black; body above marbled with confluent white and black spots; beneath ferruginous. Length of head and body one foot; tail four inches.

*Arctomys Alpina*, Parry, *Nar. 2d Voy.* 61. *Arctomys Parryii*, Richardson, *Append. Franklin. Voy.*

Ground Squirrel, Hearne, *Jour.* 141. Quebec Marmot, Forster, *Phil. Trans.* LXXII. 378.

Inhabits Canada.

641. 11. *A. Tridecim-lineata* (Wood's Marmot.) Fur deep chestnut above, striped with six white lines, alternating with an equal number of longitudinal rows of white spots; white beneath.

*Arctomys Woodii*, Sab. *Trans. Lin. Soc.* XIII. 599. *Sciurus Tridecim-lineatus*, Mitchell, *Med. Repos.* VI. *Arctomys Tridecim-lineata*, Harlan, *Faun. Amer.* 164.

Striped and Spotted Ground Squirrel, Say. *Exped. Rocky Mount.* II. 171. Federation Squirrel, Mitchell.

Inhabits —

*Obs.* This species, at first referred to the Squirrels, seems allied to M. F. Cuvier's division of Spermophilus.

The two following species are referred conditionally to their present situation.

642. 12. *A. Ludoviciana* (Prairie Marmot.) Fur light, dirty reddish brown above, intermixed with some gray, also a few black hairs; the hair next the skin bluish-white, then light reddish, tips gray; below dirty white. Length of head and body one foot four inches; tail two inches and three-quarters.

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*Arctomys Ludoviciani*, *Ord. Guthrie, Geog.* v. 303: *Arctomys Missouriensis*, *Warden, U. States*, v. 6. vi.

Prairie Dog, *Lewis and Clarke, Exp. Missouri.*

Icon. Nobis.

Inhabits North America.

643. 13. *A. Latrans* (Barking Marmot.) Uniform brick-red, lighter beneath; cheeks furnished with pouches; a few long hairs are inserted on each jaw, and directly over the eye.

*Arctomys Latrans*, *Harlan, Faun. Amer.* 306.

Barking Squirrel, *Lewis and Clarke, Exped.* vi. 175.

Icon. —

Inhabits Missouri.

*Obs.* Perhaps a *Spermophilus*, but it lives in society.

Several other Marmots have been mentioned by different writers; but as their great leading character of dentition is not noticed, they have been rejected from the genus until better authenticated: of these are the Hoary Marmot of *Pen. Quad.* II. 130; the Marmot Gundi, of the same, p. 137; the Tailless Marmot, of the same, p. 137; the Mus Maulinus, of *Molina Chili*, 268; the Glis Tscherskessicus, of *Eraleb.*; and the *Arctomys Missouriensis*, of *Warden's United States*, t. v. 627.

Among these, also, we shall insert the species, or variety, we have noticed at p. 170, of Vol. III, and figured under the name of Marmot Diana.

SCIURUS. Incisors  $\frac{3}{3}$ ; canines  $\frac{0}{0}$ ; cheek-teeth  $\frac{4}{4}=22$ ; upper incisors flat in front, and wedge-shaped at the extremity; the lower pointed and compressed laterally; cheek-teeth tubercular, the fives in the upper jaw found only in the young state; body small; ears erect; head small; eyes large; anterior feet with four long toes, and a tubercle instead of a thumb; the posterior with five long toes, all

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furnished with long crooked nails. Tail long, often very villose; two pectoral teats, and six ventral.

This genus has been divided into groups distinguished by a flat cylindrical tail, and by the presence or absence of cheek-pouches.

644. 1. *S. Vulgaris* (Common Squirrel.) Bright red; ears terminated by a pencil of hairs.

*Sciurus of the Ancients.* *Sciurus Vulgaris*, *Linn. Syst. Nat.* 86.

Icon. *Schreb. tab.* 212; and most naturalists. Skull, *Fisch. Ade. Zool. f.* 6, f. 3.

Inhabits Europe and the north of Asia:

*Obs.* Several varieties of the Common Squirrel have been noticed; indeed the colours are various, from red through different shades of cinereous, even to black. In high latitudes they vary with the season, and become bluish ash-colour in winter.

645. 2. *S. Alpinus* (Alpine Squirrel.) Deep brown varied with yellowish-white on the back; beneath white; feet yellow, with a yellow band separating the white of the neck and the grey of the outside of the limbs from the brown of the back; hairs of the tail very long, black, and rugged, with yellow at the base; ears ending in a tuft of hairs.

*Sciurus Alpinus*, *F. Cuv. Mam. Lithog.*

Icon. *F. Cuv. l. c.*

Inhab. Pyrenees.

646. 3. *S. Maximus* (Great Squirrel.) Upper part of the head, flanks, and legs, purpurescent reddish-brown, with a transverse stripe on the shoulders; lower part of the back, loins, and tail, black; under part of body and interior of limbs pale yellow; nearly as big as a Cat.

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*Sciurus Maximus*, Gm.

Grand Ecureuil de la Côte de Malabar, *Sonnerat, Voyage*, t. 2, 139.

Icon. *Schreb. tab. 217, B. Sonnerat, l. c. pl. 87.*

The Baron identifies this specifically with the *S. Macrourus* of Gmel. Desmarest treats them as distinct, and gives as synonyms to that species the Long-tailed Squirrel of *Pen. Indian Zool.* and the Ceylon Squirrel, *ejusd. Quad.*, the *Sciurus Ceilonicus* and *Zeylonicus* of *Boddaert* and *Ray*, and with *Schreber's figure*, 217.

647. 4. *S. Madagascariensis* (Madagascar Squirrel.) Upper part of the body deep black; throat yellowish-white; belly yellowish-brown; tail black, longer than the body; body from eighteen to twenty inches long.

*Sciurus Madagascariensis*, *Shaw's Zoology* II. part 1, 128. Ecureuil de Madagascar, *Buff. Hist. Nat. Sup.* 7.

Icon. *Buff. l. c. pl. 63.*

Inhabits Madagascar.

648. 5. *S. Ceylonensis* (Ceylon Squirrel.) Fur above black; below yellow; tail gray.

*Sciurus Ceylonicus*, *Rai. Quad.* 215. *S. Ceylonensis*, *Wodd. Elench.* 117. *S. Macrourus*, *Gmel.*

Long-tailed Squirrel, *Penn. Ind. Zool.* Ceylon Squirrel, *Penn.*

Icon. *Penn. l. c. t. 1. Schreb. t. 217. Ency. Méthod.* t. 75, f. 4.

Inhabits Ceylon.

*Obs.* Cuvier is of opinion that this is a mere variety of the *S. Maximus*.

649. 5. *S. Prevostii* (Prévost's Squirrel.) Black above, yellow on the flanks, and reddish-brown underneath; tail brown. About the size of the Common Squirrel.

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*Sciurus Prevostii*, *Desmarest, Ency. Méthod. Mammalogie*,  
sp. 537.

Icon. —?

Inhabits India.

650. 6. *S. Leschenaultii* (Jeralang, or Leschenault's Squirrel.) Ochery-brown above; head, throat, belly, and anterior part and internal sides of the limbs, yellowish-white; brown above, and yellowish underneath. Body rather more than a foot in length; tail about the same.

*Sciurus Albiceps*, *Geoff. Collect. du Mus.* *S. Leschenaultii*, *Desm. Mus.* 335.

Icon. *Horsfield, Zool. Journal.*

Inhabits Java.

Var. A, darker.

651. 7. *S. Bicolor* (Two-coloured Squirrel.) Fur deep brown or blackish above; bright yellow beneath; eyes surrounded by a black circle; ears not bearded. Three feet from nose to end of tail.

*Sciurus Bicolor*, *Sparman, Act. Soc. Goth.* *S. Javanensis*, *Schreb. Javan Squirrel, Pennant, Quad.*

Icon. *Schreb. f.* 216.

Inhabits Java.

652. 8. *S. Bilineatus* (Two-rayed Squirrel.) Fur above gray, with a longitudinal white line on each side; below yellowish; tail rather shorter than the body.

*Sciurus Bilineatus*, *Geoff. Col. Mus.* *S. Notatus*, *Bodd. Elench.* i. 119. *S. Platani*, Var. *Ingerman.*

Plantain Squirrel, *Pen. Hist. Quad.*

Icon. *Horsf. Java, t.*

Inhabits Java.

653. 9. *S. Affinis* (Allied Squirrel.) Fur ash-gray above;

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beneath nearly white, with a reddish brown line on each side.

*Sciurus Affinis*, *Raffl. Lin. Trans.* XIII.

Icon. —

Inhabits Sumatra.

654. 11. *S. Nigrovittatus* (Black-banded Squirrel.) Fur foxy-gray varied with brown above; edges of the abdomen and circle round the eyes paler; beneath gray, with a lateral black line. Tail longer than the body, ringed with black.

*Sciurus Nigrovittatus*, *Horsf. Zool. Java.*

Icon. —

Inhabits Java.

655. 12. *S. Tenuis* (Slender Squirrel.) Fur above finely variegated with deep gray and black; lateral edge foxy; beneath yellowish-gray; tail foxy, banded with black.

*Sciurus Tenuis*, *Horsf. Zool. Java.*

Icon. —

Inhabits Singapore.

656. 13. *S. Finlaysonii* (Finlayson Squirrel.) Fur milk white; back yellowish; eyes, whiskers, and soles of the feet, black; tail with scattered black hairs.

*Sciurus Finlaysonii*, *Horsfield, Zool. Java.*

*Ecureuil Blanc de Siam*, *Buff. Hist. Nat.* VI. 256.

Icon. —

Inhab. Java.

657. 14. *S. Palmarum* (Palm Squirrel.) Upper part of the body gray-brown, marked with three longitudinal bands of a pale white, the two lateral terminating at the eyes, under part white; tail reddish above, whitish underneath. Length of the body about six inches.

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*Sciurus Palmarum*, *Gm.* 149. *S. Pencillata?*, *Leach*.  
*Palmiste*, *Buff. Hist. Nat.* 10, 126. *Rat Palmiste*,  
*Brisson, Rêg. Anim.* 156.  
*Icon. Buffon, l. c. p.* 26. *Leach, Zool. Misc. t.*  
*Inhabits India, Africa.*

658. 15. *S. Getulus* (Barbary Squirrel.) Brown above,  
with longitudinal white lines reaching to the tail; body  
about five inches long; tail the same.

*Sciurus Getulus*, *Gm.*

Barbarian Squirrel, *Edwards*, 198. White-striped  
Squirrel, *Pen. Glean. Quad.* II. 150. Baresque, *Buff.*  
*t.* 10.

*Icon. Edwards, l. c. tab.* 198. *Schreber*, 221. *Buff.*  
*l. c. pl.* 27. *Ency. Méthod. t.* 76. *f.* 3.

*Inhabits Northern Africa.*

659. 16. *S. Capistratus* (the Masked Squirrel, or Capis-  
trate). Body ashy; head black; muzzle, ears, and belly,  
white. Larger than the species of Europe.

*Sciurus Capistratus*, *Bosc. Ann. Mus. t.* 1. 281.

*Ecureuil à Masque*, *Cuvier, Règne Animal.* I. 205.

*Icon. Ency. Méthod. Supp. t.* II. *f.* 2. *Schreb. t.* 313,  
*B. Brown, Illus. t.* 47.

*Inhabits South Carolina.*

*Obs.* There is a black variety of this species; (Brown's  
Illustration, pl. 47,) and a gray variety, with a black  
belly, (Desmarest,) *Ency. Méthod. Mammalogie*, 333.

M. F. Cuvier also considers the Coquallin of Buffon,  
*t.* 13, *Sciurus Variegatus*, of Gmelin, to a variety of this  
species.

There is still a black Squirrel of North America, which  
M. Desmarest considers different from the black variety of  
the Capistrate by its smaller size, the softness of the fur,  
and because the nose and ears are not regularly white, and

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are different from the black variety of the Gray Squirrel and the tail shorter. He identifies this with the Black Squirrel of Catesby, Carol. t. 273, and Barham's Travels in North America, II. 31, and with Schreber, fig. 215.

660. 17. *S. Cinereus* (Gray or Carolina Squirrel). Larger than the European species generally; ash-coloured, with a white belly, a yellowish line on the belly.

*Sciurus Cinereus Virginianus* Major, *Ray. Syn. Quad.* 215. *Sciurus Carolinensis*, et *Cinereus*, *Gm.*

Petit Gris, *Buff. t.* 10. Gray Squirrel, *Pen. Quad.* II. 144.

Icon. *Buff. l. c. pl.* 25. *F. Cuvier, Mam. Lithog.*

Inhabits North America.

Var. B. *Rubrolineatus*. Fur grayish on the sides, with a red line on the middle of the back; belly white.

*Sciurus Rubrolineatus*, *Desm. Mam.* 333.

*Eureuil Rouge*, *Warden, Descrip.* v. 630.

661. 18. *S. Rufiventer* (Red-bellied Squirrel.) Fur gray-above, bright red beneath; feet brown; tail shorter than the body; base gray-brown and yellow.

*Sciurus Rufiventer*, *Geoff. Col. Mus. Desm. Dict. Hist. Nat.* x. 103.

Icon: —

Inhabits North America.

662. 19. *S. Ludoviciana* (Red River Squirrel.) Body, and upper part of the tail, dark gray; the belly, inside of the legs, and thighs, and under part of tail, reddish-brown; ears not bearded; tail longer than the body, very broad.

*Sciurus Ludoviciana*, *Curtis. Barton's Med. Phys. Journ.* VI. 47.

Icon: —

Inhabits the shores of the Red River, in America.

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663. 20. *S. Grammurus* (Lined-tail Squirrel.) Body cinereous; fur very coarse; three black lines on each side of the tail.

*Sciurus Grammurus*, Say, *Long's Exped.* vi. 72.

Icon. —

Inhabits the Rocky Mountains, America.

664. 21. *S. Lateralis* (Side-marked Squirrel.) Above brownish, cinereous; each side of the back marked with dull yellowish stripes, white dilated line, broader before.

*Sciurus Lateralis*, Say, *Long's Exped. Rocky Mount.* vi. 46.

Icon. —

Inhabits the Rocky Mountains, America.

665. 22. *S. Quadrivittatus* (Four-banded Squirrel.) Head brownish, intermixed with fulvous, marked with four white lines; sides fulvous; beneath whitish.

*Sciurus Quadrivittatus*, Say, *Long's Exped. Rocky Mount.* vi. 45.

Icon. —

Inhabits the Rocky Mountains, America.

666. 23. *S. Magnicaudatus* (Large-tailed Squirrel.) Body above, and each side, mixed with gray and black; sides of the head and orbits pale ferruginaceous; cheeks, under the eyes, and ears, dusky.

*Sciurus Macrourus*, Say, *Long's Exped. Rocky Mount.* vi. 115. *S. Magnicaudatus*, Harlan, *Faun. Amer.* 178.

Inhabits Canada.

Length of head and body one foot seven inches; tail ten inches.

667. 24. *S. Clarkii* (Clarke's Squirrel.) Silvery gray above; shoulders, flanks, belly, and insides of limbs, white,

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with a slight ochery tint; tail flat, widest in the middle, and terminating in a point.

Icon. Hamilton Smith, *MSS.*

Inhabits near the Missouri, in North America.

668. 25. *S. Æstuans* (the Guerlinguet Squirrel.) Olive-gray, mixed with red above; pale red underneath; tail round, longer than the body, slightly annulated, brown, black and yellow; paws, the colour of the body; body about eight inches long.

*Sciurus Æstuans*, *Gm. Myoxus Guerlinguet*, *Shaw, Zool. II. part I. 171. Le Grand Guerlinguet, Buff. Sup. t. 7.*

Icon. *Buff. l. c. pl. 65. Ency. Méthod. t. 77. f. 1.*

Inhabits Guiana and Brazil.

669. 26. *S. Insignis* (Bokol Squirrel.) Fur, gray brown above, with three black lines; head gray; outer side of the limbs and sides red; chine, neck, and belly, white; tail cylindrical, brown.

*S. Insignis*, *Des. Mam. 544. Larog. F. Cuv. Mam. Lithog. Bokokol, of Java.*

Icon. *F. Cuv. l. c. t. Horsf. Java, t. 3.*

Inhabits Sumatra.

670. 27. *S. Pusillus* (the Little Guerlinguet.) Above part of the body gray-brown and olive, mixed; lower parts of the same colour, but a lighter tint; muzzle yellow; tail round, shorter than the body, covered with brown and yellow hairs, intermixed.

*Sciurus Pusillus*, *Geoff. Col. Mus. Le Petit Guerlinguet, Buff. Supp. VII. 263. The Wood-Rat of Cayenne.*

Icon. *Buff. l. c. pl. 46. Ency. Méthod. t. 77. f. 2.*

Inhabits Cayenne.

672. 28. *S. Ginginianus* (Gingi Squirrel.) Upper part

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of the body blackish sprinkled with white, with a white stripe on each side; under part white; tail round at its insertion, divided near the end, and varied with black and white; nails very long, compressed, and slightly arched; body above a foot in length; tail two-thirds as long.

*Sciurus Dschinschicus*, *Sonnerat, Voy.* II. 140. *Sciurus Ginginianus*, *Shaw's Zool.* II. p. I. 147. *Sciurus Erythropus*, *Geoff. Collect. Mus.* *Sciurus Albovittatus*, *Desmarest, Nouv. Dict. d'Hist. Nat.* x. 110. *Sciurus Brazilinsis*, *Brisson, Règne Anim.* 154?

Icon. *Sonnerat, l. c. tab.* 89.

Inhabits Cape of Good Hope.

Var. a. Brownish-gray above, lighter underneath; tail appearing black, though white hairs are intermixed.

671. 29. *S. Annulatus* (Annulated Squirrel.) Greenish-gray above, without lateral bands, white underneath; tail longer than the body, round, annulated, black and white; size of the Palm Squirrel.

*Sciurus Annulatus*, *Desmarest, Ency. Méthod. Mammalogie, Sp.* 546, from the Paris Museum.

Lewis's Squirrel, nobis?

Icon. Nobis?

Habitat unknown.

671. 30. *S. Bivittatus* (Two-banded Squirrel.) Fur black-brown, picked with yellowish above, bright red beneath, with a white upper and a black lower line on each side; tail round, black, brown, end red.

*S. Bivittatus*, *Desm. Mam.* 543. *S. Vittatus*. *Horsf. Java.*

*Ecureuil Toupays*, *F. Cuv. Mam. Lithog. Tupai, Raffles.*

Icon. *F. Cuv. l. c. t.*

Inhabits Sumatra.

Var. b. With the upper lateral line and belly yellow.

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Several other species have been named as such by different zoologists, but which, for want of more detailed observation, remain doubtful. Of these are,

1. *S. Persicus*, Gm. 148, *Voy. t.* 40. Dusky yellow underneath, with white sides; beardless ears; and blackish-gray tail, with a white band. Inhabits Persia.
2. *S. Anomalus*, Gm. 148 (Georgian Squirrel, Shaw, *Zool.*) Dusky ferruginous, with tail and under parts fulvous, and rounded beardless ears. Inhabits Georgia. *Ency. Méthod. t.* 75. f. 2. *Schreb. f.* 215.
3. *S. Erythræus* (Ruddy Squirrel of Pennant and Shaw.) Yellowish-brown, with the under parts and tail reddish-ferruginous, and ciliated ears. Inhabits North America? *Horsf. Java, N.* 10.
4. *S. Abyssinicus*. Rusty black above; belly and forefeet gray. Three times larger than *S. Vulgaris*.
5. *S. Indicus*. Purple-brown, yellow underneath; tip of the tail orange-coloured. Inhabits the vicinity of Bombay. Sixteen inches long; tail seventeen.
6. *Plantain Squirrel*, *Pen. Quad.* II. 151. Lighter coloured than the Common Squirrel, with a yellow line along the side; resembles the common species.
7. *Mexican Squirrel* of Seba, *Thes.* I. p. 76, f. 2. Ashy-brown, with five or seven longitudinal white stripes. Desmarest thinks this is a factitious species!
8. *S. Flavus*. Yellow, with roundish ears without pencils. Less than half the size of the Common Squirrel. From Guzarat, in India, according to Pennant; but from South America, according to Linnæus.

Raffinesque, in the *Annals of Nature*, has described five

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North American species of Squirrels; S. Ruber (not Warden,) S. Feletus, S. Phaiopus, S. Melanotus, S. Lateralis.

**PTEROMYS.** *Dentition similar to that of genus Sciurus. Head round; ears round; eyes large; anterior feet with four elongated toes, furnished with compressed sharp talons, with the rudiment of a thumb, having an obtuse nail; posterior feet with five long toes, much divided, and fitted for seizing; tail long, villose; skin of the sides extended from the anterior to the posterior extremities, forming a sort of parachute.*

675. 1. *P. Sibiricus* (Common Flying Squirrel, or Polatouch.) Ashy-gray above; white underneath; tail half the length of the body; about seven inches long.

Mus Ponticus, aut Scythicus Volans, *Gerner*. Sciurus Volans, *Lin. Faun. Suec.* i. 13.

Ecureuil Volant de Sibère, *Brist. Règ. Anim.* 159. European Flying Squirrel, *Pen. Quad.* 165. Common Flying Squirrel, *Shaw, Zool.* ii. p. 1, 151. Polatouche Sapan, *Desm. Nouv. Dict. d'Hist. Nat.* t. 27, 404, and *Pteromys Sibiricus*, *ejusd. Ency. Méthod. Mammalogie*, sp. 553.

Icon. *Schreb. tab.* 223. *Shaw, l. c. tab.* 149.

Inhabits Finland, Lapland, &c., in Europe and in Siberia.

Type of F. Cuvier's genus *Sciuropterus*.

673. 2. *P. Volucella* (Assapan.) Grayish-brown above; white underneath; tail nearly as long as the body; body about five inches long.

*Sciurus Volucella*, *Pallas, Glires*, 353.

Polatouche, *Buff. t.* 10. Flying Squirrel, *Catesby, Carolina*, ii. Assapan, *F. Cuvier, Mam. Lithog.*

Icon. *Schreber, tab.* 222. *Buff. l. c. tab.* 41. *Catesby, Carolina*, pl. 76. *Edwards, Birds*, pl. 191. *Ency. Méthod. t.* 77, f. 4. *F. Cuv. Mam. Lithog.*

Inhabits Canada and the United States.

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674. 3. *P. Genibarbis* (the Kechubu.) Hoary on the upper part, with a yellowish dorsal line ; tail oblong, obtuse, flat, and distichous ; numerous vibrissæ on the cheeks.

*Pteromys Genibarbis*, *Horsfield, Zool. Java, No. 4.*

Icon. *Horsfield, l. c.*

Inhabits Java.

675. 4. *P. Nitidus* (the Bright Pteromys.) Deep chestnut above ; bright red underneath ; tail deep brown, particularly near the end, and cylindrical. Body about sixteen inches long.

*Pteromys Nitidus*, *Desmarest, Ency. Méthod. Mammalogie, sp. 551.*

Ecureuil Eclatant, *Geoff. Collect. du Mus.*

Inhabits Java.

676. 5. *P. Sagitta* (the Barbed Polatouche.) Deep brown above ; white underneath ; tail bright brown. Length of body about six inches, of tail nearly the same.

*Pteromys Sagitta*, *Cuv. Rég. Anim. 207.* *Sciurus Sagitta*, *Penn. Polatouche Flèche, Geoff. Collect. du Mus.*

Icon. —

Inhabits Java.

677. 6. *P. Petaurista* (Sailing Squirrel.) Chestnut colour, with the hairs tipped with white on the shoulders ; whitish-gray underneath ; thighs red ; feet brown ; tail blackish and cylindrical.

*Sciurus Petaurista*, *Pallas, Miscel. 54.* *Tagnan, Buff. Hist. Nat. Sup. III.* *Sailing Squirrel, Pennant, Quad. II. 152.*

Icon. *Pallas, l. c. p. 6, f. 1 and 2.* *Buff. l. c. III. tab. 21 and 22 bis*, and *Sup. tab. 67.* *Schreb. tab. 224.* *Ency. Méthod. t. 77, f. 5, 6.*

Inhabits India and the Islands.

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678. 7. *P. Genibarbis* (the Kechubu of Java.) Gray on the upper part; white underneath; vibrissæ on the cheeks and side of the head.

*Pteromys Genibarbis*, *Horsfield's Zoological Researches*.

Icon. *Horsfield, l. c.*

Habitat Java.

679. 8. *P. Lepidus*. Fur blackish-brown; beneath white; head and middle of the back gray; tail longer than the body, oblong, flat; ears oblong, simple, naked; vibrissæ very large.

*Pteromys Lepidus*, *Horsf. Java*.

Icon. *Horsf. l. c.*

Inhab. Java.

*Obs.* For the *Cheiomys* or Aye Aye, placed after *Pteromys* in the text, see p. 51 of Table.

SECTION II. *With imperfect clavicles, or none.*

Genus III.—HYSTRIX.

Incisors  $\frac{3}{2}$ ; canines  $\frac{0}{0}$ ; cheek-teeth  $\frac{4}{4} = 20$ ; cheek-teeth, with the tops flat, but furnished with ridges of enamel. Head strong; muzzle thick; ears short and long; tongue furnished with spiny scales; anterior feet with four toes, and the rudiment of a thumb; posterior with five; nails strong; spines on the body, sometimes intermixed with hair; tail more or less long, sometimes prehensile.

*Obs.* M. F. Cuvier has given us some remarks on the teeth and characters of this genus, and has divided it into five genera; it had before been usually divided into two sections according to the tail. See *Memoires du Museum d'Histoire Naturelle*, tom. ix. p. 413.

680. 1. *H. Cristata* (Crested Porcupine.) Very long spines on the back, annulated black and white; a mane of

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long stiff hairs on the head and neck ; tail short ; length of body upwards of two feet ; of tail about three inches,

*Hystrix Cristata*, *Lin. Sys. Nat.* 76. *Hystrix Dorsata*, *Gm.*

Porc-epic, *Buff. His. Nat.* 12. Crested Porcupine, *Pen. Quad.* II. 122.

Icon. *Buff.* 12, tab. 51, 52. *Schreber*, tab. 169. *Ency. Méth.* 64, f. 3.

Inhabits Africa, and naturalized in Southern Europe.

*Obs.* Type of M. F. Cuvier's genus *Hystrix*.

681. 2. *H. Fasciculata*, (Pencil-tail Porcupine.) Spines like strips of parchment ; those on the body flat, black. Less than the Common Porcupine.

*Histrix Fasciculata*, *Lin.* *Mus Fasciculatus*, *Desmarest, Mammal.* 308. *Acanthion Daubentonii*, *F. Cuv.*

Porc. Epic. de Malacca, *Buff. Sup.* 67. Brush-tailed Porcupine, *Shaw, Zool.* II. 11.

Icon. *Buffon*, l. c. pl. 77. *Shaw, Gen. Zool.*

Inhabits India.

*Obs.* Type of F. Cuvier's genus *Acanthion*.

682. 3. *H. Longicauda*. (Long-tailed, or Marsden's Porcupine.) Like the last but tail shorter, notwithstanding the name given by Marsden.

*Histrix Longicauda*, *Marsden, Sumatra.* *Acanthion Javanicum*, *F. Cuvier.*

Landak of Java.

Icon. *Marsden*, l. c. t. 17. *F. Cuv. Mem. Mus.* X.

Inhabits Sumatra.

683. 4. *H. Macroura* (Rice-tailed Porcupine.) Very like the Cöendou, but the tail having a bundle of spines at the end formed like grains of rice.

*Histrix Macroura*, *Gm. S. N.* 77. *Histrix Orientalis*,

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*Brisson, Quad.* 131. *Porcus Aculeatus Sylvestris, Seba, Thes. t.* 12. *Mus Macrourus, Desmarest, Mammal.* 309.

Rice-tailed Porcupine and Long-tailed Porcupine, *Pen. Iridescent Porcupine, Shaw, Gen. Zool.* vol. II.

Icon. *Seba, l. c. pl.* 52. *Shaw, l. c.* 124. *Pen. Quad. t.* 72.  
Inhabits India.

684. 5. *H. Couiy* (the Couiy of D'Azara.) Body covered with numerous short spines, yellowish at their base and point, and brown in the middle; tail thick, shortish; the latter half naked, and prehensile; nearly two feet long; tail nine or ten inches.

*Hystrix Prehensilis, var. 7, Gm. Hystrix aculeis-apparantibus caudâ brevi, Briss. Règ. Anim.* 127. *Erethizon Buffonii, F. Cuv. Mem. Mus. Eucritus, Fischer, Zool.* VII. 102.

*Couiy D'Azara, Quad. du Paraguay, t.* II. 105. *Coëndou, Buff. t.* 12. (This name is probably referrible to the next species.) *Hoitzlacuatzin seu Flacuatzin, Hernandez. Mexican Porcupine, Pennant.*

Icon. *Buff. l. c. tab.* 54.

Inhabits South America.

685. 6. *H. Dorsata* (Canada Porcupine.) Hair long; prickles short; male deep brown; female lighter brown; tail long; bristles of the head and neck long.

*Histrix Hudsonius, Briss. H. Dorsata, Gmel. H. Pilo-sus, Casteby, Car. App.* 30. *Cavia Hudsonius, Klein. Ere-thizon Dorsatum, F. Cuv. Urson, Buff.* XII.

Icon. *Schreb. t.* 169. *Buff. XII. t.* 55. *Ency. Méthod. t.* 65, f. 1.

Inhabits Canada.

*Obs.* Type of M. F. Cuvier's genus *Erethizon*.

686. 7. *H. Cuandu* (the Couendou.) Body covered with

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short spines, annulated black and white, without any mixture of hair on the upper part; tail two-thirds the length of the body, pointed and prehensile.

*Hystrix Cuandu*, *Desmarest, Mamm.* 346.

*Hystrix Prehensilis*, var.  $\beta$ . *Gm.* 76. *Hystrix Americanus* Major, *Brisson, Règ. Anim.* 130. *Sinœthere Prehensilis*, *F. Cuv.*

Coëndou à longue queue, *Buff. Sup.* VII. Brazilian Porcupine, *Pennant.*

Icon. *Buffon, l. c. tab.* 78. *Johnston, tab.* 10. *Shaw, Zool.* VI. t. 123. *Pennant, Quad. t.* 73.

Inhabits South America.

*Obs.* Type of M. F. Cuvier's genus *Sinœthere*.

687. 8. *H. Spinosa* (Spiny Sphiggurus.) Spines rather long, dark at the end; tail beneath naked.

*Sphiggurus Spinusus*, *F. Cuv. Mem. Mus.* v.

Le Coni, *D'Azara.*

Inhabits Paragua.

*Obs.* Type of M. F. Cuvier's genus *Sphiggurus*.

688. 9. *H. Villosa* (Hairy Sphiggurus.) Spines hid in the long thick hairs.

*Sphiggurus Villosus*, *F. Cuv.*

Orico, *Brazilians.*

Inhabits Brazils.

## Genus IV.—LEPUS.

Incisors  $\frac{1}{2}$ ; canines  $\frac{00}{00}$ ; cheek-teeth  $\frac{22}{22}$  = 20. Upper incisors in pairs, two in front, and two immediately behind them; the former large and cuneiformed, with a longitudinal furrow down the front, the latter small; the lower incisors square; cheek-teeth with flat crowns with transverse laminæ of enamel; ears and eyes large; five toes to fore-feet, and four to those behind, with nails slightly

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arched; interior of the mouth, and soles of the feet to the nails, covered with hair; tail short; mammæ from six to ten; cæcum very large.

689. 1. *L. Timidus* (the Common Hare.) Brownish red-gray; chin and belly white; ears black at the point; tail white underneath, black above. About two feet in length.

*Λαγως, Ælian.* *L. Timidus, Lin. S. N.* *Lepus, Plin.*

Common Hare. Hare of Authors.

Icon. *Schreb.* 233 *A. Buff. l. c.* 38. *Pennant, l. c. tab.*

Inhabits Europe, northern and temperate parts of the Old World.

690. 2. *L. Variabilis* (Variable Hare.) Yellow-gray in summer, white in winter; ears shorter than the head, and black at the tip at all times; tail white in winter, gray in summer. Larger than the Common Hare.

*Lepus Variabilis, Pallas, Glires,* 40. *Lepus Albus, Bris. Règ. Anim.* 139.

Varying Hare, and Alpine Hare, *Penn, Br. Zool.* 1. n. 20.

Icon. *Schreb. tab.* 235, *B. Penn. Quad. t.* 96, *f.* 1.

Inhabits Northern parts of Europe, Asia, and America.

*Obs.* The *Lepus Hybridus* of Pallas, the Spurious of *Pennant*, is probably a variety of this species.

691. 3. *L. Glacialis* (Snowy Hare.) White ears, black at the tip, longer than the head; nails strong, broad, and depressed. Larger than *L. Variabilis*.

*Lepus Glacialis, Sabine, Suppl. Parry's Voy.*

Lievre du Grœnlandon *Rekalek, Desmarest,* 349.

Icon —

Inhab. within the Arctic Circle. *Mus. Brit.*

692. 4. *L. Virginianus* (Virginian Hare.) Grayish-

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brown in summer, white in winter ; the orbits of the eyes surrounded by a reddish fawn colour at all times ; ears and head of nearly equal length ; tail very short.

*Lepus Virginianus*, *Harlan, Amer. Fauna*, 196.

Varying Hare, *Warden's Descrip. Unit. States*, *V. B. 2.*

American Hare, *Pennant, Quad. ? Hare or Hedge Coney*, *Lawson*, 122. ?

Icon —

Inhab. Virginia.

Var? Plumbeous above ; white beneath during summer, of a pure white in winter ; tips of the ears black or reddish-brown at all seasons ; body covered with fine close fur ; tail round, bluntly pointed,

Varying Hare, *Lewis and Clark's Exped.* vi. 179.

693 5. *L. Cuniculus* (the Rabbit.) Gray and yellow mixed ; reddish about the neck, throat, and belly ; white tail ; brown on the upper side about seventeen or eighteen inches long.

*Δασυπους*, *Aristotle. Dasytus*, *Pliny. Cuniculus*, *Johnston. Lepus Cuniculus*, *Lin. Sys. Nat.* 1. 77. *Lepusculus*, *Klein.*

Rabbit or Coney of *Authors.*

Icon. *Schreb.* 236, *A. Buff. t. 6. tab. 50. Ency. Méthod. t. 62, f. 3, t. 63, f. 1, and t. 62, f. 4.*

Habitat by transportation almost all parts of the world, except the north of Asia ; said to have been originally from Africa.

In domestication the Rabbit varies without end. The most remarkable are—1. The Angora. 2. The Russian Rabbit, figured by *Pennant* from *Edwards*, *t. 69, f. 2.*

694. 6. *L. Tolai* (Baikal Hare.) Gray mixed with brown and yellow ; belly white ; neck yellowish ; white above, yellowish underneath ; paws yellow ; ears of the

female shorter than those of the male. Larger than the Common Hare.

*Lepus Tolai*, Pallas, *Glires*, 17. *Lepus Dauricus*, *Erxleben*.

Tolai, *Buff.* 15, 138. *Lapin de Sibérie*, *Cuv. Règ. Anim.* 1. 211. *Baikal Hare*, *Pennant*, *Quad.* 104.

Icon. *Schreb. tab.* 234. *Pallas*, *l. c. tab.* 4. *f.* 2.

Inhabits Mongolia and Tartary.

695. 7. *L. Americanus* (American Hare.) Yellow gray, varied with brown; neck yellow; throat and belly white; ears shorter than the head, without black tips; about as big as a rabbit.

*Lepus Americanus*, *Erxleb.* *Lepus Hudsonius*, *Pallas*, *Glires*, *pa.* 30. *Lepus Nanus*, *Schreber*.

American Hare, *Forster*, *Phil. Trans.* 62, *pa.* 376.

Icon. *Schreber*, 234, *B.*

Inhabits North America.

696. 8. *L. Africanus*, (Cape Hare.) Ears one fifth larger than the head; size and colour of the Common Hare, but the legs are ferruginous, and a little larger.

*Lepus Capensis*, *Lin. S. N.?* *Lepus Ægyptius*, *Geoff. Mem. d'Egypt.*

*Lièvre d'Afrique*, *Cuv. Règ. Anim.* 211.

Icon. *Geoff. l. c. tab.*

Inhabits the whole of Africa.

*Obs.* The *Lepus Capensis* has been treated as distinct from the *Lepus Ægyptius*, but the Baron places them together.

697. 9. *L. Brasiliensis* (Tapiti, or Brazilian Hare.) Varied with brown and yellowish above; a white half collar on the throat; ears much shorter than the head; tail very short.

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*Lepus Brasiliensis*, Lin. S. N. 78. *Lepus Tapeti*, *Boddaert*. *Tapeti Brasiliensibus*, *Marcgr. Brasil.* *Lepus Ecaudatus*, *Brisson*, *Quad.* 97.

*Tapéti*, *Marcg. Bras.* 22. *Pison*, *Ind.* 102. *Lièvre Tapeti*, *D'Azara*, *Quad. of Paraguay*, II. 57.

Brazilian Hare, *Pen. Quad.* II. 107. Collared Rabbit, *Wafer*.

Icon. *Marcgrave*, l. c. 223. *Pison*, l. c. 102.

Inhabits South America.

The *L. Viscaccior* of Gmelin, 160, is said to have four toes on the fore-feet and three behind, with a long tail. It seems probable that an animal of some other species was intended.

698. 10. *L. Nigricollis* (the Moussel.) Top of head sprinkled yellow; red sides; gray chin, and throat white; grayish-white band from the muzzle to the ear; upper part and sides of neck and shoulder bright black; size of a rabbit.

*Lepus Nigricollis*, *F. Cuvier*, *Dict. des Sciences*, xxvi.

*Moussel*, *Id.*

Icon. —

Inhabits Malabar and Java.

*Obs.* Brought by MM. Leschenault, Diard, and Duvaucel from India.

699. 11. *L. Saxatilis* (Rock Hare.) Reddish-gray; under parts white; ear red behind; black-brown at tips.

*Lepus Saxatilis* and *Lièvre des Roches*, *F. Cuvier*, *Dict. de Sciences Nat.* xxvi.

Icon —

Inhabits the Cape.

*Obs.* Brought by M. de Leland from the Cape.

Sub-genus LAGOMYS. *Teeth and toes similar to those*

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of *Lepus*; ears moderate; eyes round; hind legs not much larger than those before; fur under the feet; tail none; mammae four or six; clavicles nearly perfect.

700. 1. *L. Alpinus* (the Pika.) Reddish-yellow; ears, and palm of the feet dark-brown. About ten inches long.

*Lepus Alpinus*, Pallas, *Glires*, 45. *Lagomys* Pika, Geoff.

Pika or Picka, of the inhabitants of the shore of Lake Baikal. Alpine Hare, Pen. II. 107.

Icon. Pallas, *l. c.* tab. 2. Schreber, 238. Pennant, *Quad.* t. 70, f. 2.

Inhabits the Northern Mountains of the Old World.

701. 2. *L. Ogotoma* (the Ogotone, or Gray Pika.) Pale brownish-gray; feet yellowish; ears oval, of the same colour as the body. About seven inches long.

*Lepus Ogotona*, Pallas, *Glires*, 59. *Lagomys Ogotona*, Desm. *Mamm.* 353. *Lepus Alpinus*, Erzleb.

Ogotome of the Mongole Tartars. Ogotoma Hare, Pen. *Quad.* II. 109.

Icon. *l. c.* tab. 3. Schreb. tab. 239. Pennant, *Quad.* t. 70, f. 3.

Inhabits Mongolian Tartary

702. 3. *L. Pusillus* (Calling Hare of Pennant.) Gray-brown; ears nearly triangular, edged with white. About six inches long.

*Lepus Pusillus*, Pallas, *Glires*, 31. and *Nov. Com. Petrop.* t. 13. 534. *Lagomys Pusillus*, Desm. *Mamm.* 353.

Calling Hare, Pen. *Quad.* II, III.

Icon. Pallas, *Glires*, tab. 1. *Com. Petrop.* tab. 14. Schreber, 237. Sulgam, *Vicq. d'Azyr. Syst. des Anim.* Pen. *Quad.* t. 70, f. 1.

Inhabits South-eastern parts of Russia.

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### Genus V.—HYDROCHÆRUS.

Incisors  $\frac{3}{3}$ , without longitudinal furrow, the lower compressed, and sharp; canines  $\frac{0}{0}$ ; cheek-teeth  $\frac{4}{4}$ , laminous. Muzzle compressed; eyes large; ears moderate; round anterior feet with four palmated toes; posterior with three. No tail. Two mammæ. Hair scattered and bristly.

703. 1. *H. Capybara* (the Capybara.) Colour dingy, deepest above; head very large; nostrils distant. Length nearly three feet.

Capybara Brasiliensibus *Marcgrave, Bras. 230.* Sus Maximus Palustris, *Barrère.* Hippopotamus Ecaudatus, *Hill. Anim. 569.* Le Cabiai Hydrochærus, *Briss. Règ. An. 117.* Mus Hydrochærus, *Lin.* Sus Hydrochærus, *ejusd. 103. 12th Ed.* Cavia Capybara, *Gm.* Hydrochærus Capybara, *Erzleb.*

Cochon d'Eau *Desmarchais, Voy. t. 3. 298.* Cabiai, *Buff. 12. 384.* Capward, *Troger's Voy. 122.* River Hog, *Waser in Damp. III. 400.* Irabubos, *Gumil, 22 or III. 238.* Capygona, *D'Azara, Quad. of Praguay, II. 12.* Thick-nosed Tapir, *Pen. Synops. 83.* Capybara Cavy, *Pen. Quad. II. 88.* Icon. *Marcgrave, l. c. Buff. l. c. tab. 49.* *Schreb. 174.*

Inhabits the shores of the great rivers of South America.

### Genus VI.—COBAYA.

Incisors  $\frac{3}{3}$ ; canines  $\frac{0}{0}$ ; cheek-teeth  $\frac{4}{4} = 20$ . Body thick; muzzle short, compressed; eyes large; ears round; legs short; four toes on the fore-feet, and three only on those behind; not palmated. No tail; two teats ventral.

704. 1. *C. Cobaya* (the Cobaya or Guinea Pig.) Wild Var. Reddish-gray, or like a hare on the upper parts.

Tame Var. Varied with large patches, black, yellow, and white. Length nearly one foot.

Aperea Brasiliensibus, *Marcgr. Bras. Ind. Pison. Amœna,*

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*F. Cuvier.* Cabaya, *G. Cuvier.* Cuniculus Brasiliensis, *Briss. Règ. Anim.* 149. Cavia Aperea, *Erzleb.* Aperea, *D'Azara, Quad. of Paraguay,* II. 6. Cavia Cobai Brasiliensibus, *Marcg. Bra.* 224. Porcellus Indicus, *Johnston, Quad.* Cavia Cobaya, *Pison, Erzleb.* Mus seu Cuniculus Americanus et Guineensis, *Ray. Syn.* 223. Mus Brasiliensis, *Lin.* Mus Porcellus, *Lin. Syst. Nat. ed.* 12. 79. Cuniculus Indicus, *Briss. Règ. Anim.* 146.

Cochon d'Inde, *Buff. Hist. Nat.* VIII. Restless Cavy, *Pen. Quad.* II. 89. Variegated Cavy, *Shaw, Zool.* II. pl. 1. 17. Rock Cavy, *Pen. Quad.*

Icon. *Marcg.* 224. *Buff. l. c. pl.* 1. *Schreber, tab.* 173.

Inhabits Brazil, Paraguay, &c.; the domesticated variety has been transported to almost all the temperate parts of the world,

Genus VII.—DASYPROCTA.

Incisors  $\frac{3}{3}$ ; canines  $\frac{0}{0}$ ; cheek-teeth  $\frac{14}{14}$  = 20. Head rather elongated; forehead flat; muzzle thick; eyes large; fore-paws with four toes, and a tubercle for a thumb; hind-legs longer than those before, with three toes, and long strong nails; sole of the foot naked and callous.

705. 1. *D. Acuti* (the Agouti.) Brown, sprinkled with yellow or reddish; orange on the crupper; ears short; tail rudimentary. Nearly two feet long.

Mus Sylvestris Americanus, *Ray, Syn.* 226. Cavia Aguti, *Gmel.* Cuniculus Americanus, *Brisson, Règ. Anim.* 143. Dasyprocta Acuti, *Illiger.* Chloromys, *F. Cuv.* Platypyga, *Illiger?* Long-nosed Cavy, *Penn. Quad.* VI. 94. Long-nosed Rabbit, *Waser.* Small Indian Coney, *Brown, Jam.* 484.

Acutis, *Johnston, Quad.* Agouti, *Buff. t.* VIII.

Icon. *Marcgrave, Bras. Johnston, Quad. tab.* 63. *Seba, tab.* 41. f. 2. *Buff. l. c. tab.* 50. *Schreb. tab.* 172.

Inhabits South America.

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706. 2. *D. Cristata* (the Crested Agouti.) Blackish, sprinkled, with red hair on the occiput ; crupper very long ; ears and tail short.

*Cavia Cristata*, *Geoff. Coll. du Mus. Dasyprocta Cristata*, *Desmarest*.

Agouti a Crête, *F. Cuvier, Dict. des Sci. t. 6.*

Icon. *Menag. Nation, No. 5, pl. 3.*

Inhabits Surinam.

707. 3. *D. Acuschy* (the Akouchy.) Brown, spotted with yellow ; crupper blackish, and belly red.

*Cavia Acuschy*, *Gm. Cavia Acuschy, Erxleb.*

Olive Cavy, *Penn. Quad. Akouchy, Buff. t. 15.*

Icon. *Burrere Fr. equinox, pl. 153. Buff. Supp. III. 36. Schreb. tab. 171.*

Inhabits the West Indies.

708. 4. *D. Patagonica* (the Patagonian Cavy.) Brownish-gray ; dotted on the back, darker on the crupper, white on the thighs and belly ; yellowish on sides ; ears long ; tail short, about thirty inches long, and the average height seventeen or eighteen.

*Cavia Patachonica*, *Shaw, Gen. Zool. vol. II.*

Lievre Pampa, *D'Azara, Quad. du Paraguay, Patagonian Hare, Byron's Voyage. Patagonian Cavy, Penn. Quad.*

Icon. *Pennant, Quad. pl. 68. Shaw, l. c. 165.*

Inhabits Patagonia.

*Obs.* This species seems nearly allied to *Lepus*.

709. 5. *D. Viscacha* (the Viscache.) Dirty white ; sides of the head black ; moustache seven inches long ; body and neck thick, large, and cylindrical ; tail nine inches long, naked at tip, but with bristly hairs on the upper part of the remainder ; anterior feet with four toes, and digging nails posterior, with three. As big as a hare.

*Dolichotes Viscacha*, *Desmarest, Jour. de Phys. Lepus*

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*Viscaccia, Molina Chili, 272. Viscacha, Niremberg, Hist. Nat. 161. Viscache, D'Azara, Quad. du Paraguay.*

Icon. —

Inhabits Brasil Chili.

*Obs.* This species appears intermediate between the genera *Lepus* and *Dasyprocta*.

Genus VIII.—CÆLOGENUS.

Incisors  $\frac{3}{2}$ ; canines  $\frac{2}{0}$ ; cheek-teeth  $\frac{4}{4}$ . Toes five on all the feet; the interior toes of the fore-feet, and interior and exterior toes of those behind, very small.

710. 1. *C. Subniger* (the Brown Paca.) Dingy-brown, spotted with white; head large; neck short; body thick; ears round; fur short and harsh.

*Paca Brasiliensibus, Marcgrave, Brazil. lib. 6. 224. Cælogenus Subniger, F. Cuvier.*

*Cottie, Johnston, Quad. III. Pag or Pague, Lery. Hist. d'un Voy. à Brasil. 138. Paca, Male, Buffon, Sup. III. 35. Pay, D'Azara, Quad. du Paraguay, II. 20.*

Icon. *Johnston, l. c. tab. 63. Buff. l. c. pl. 35. F. Cuvier, Anim. du Mus. x. pl. 9. and Mam. Lithog.*

Habitat South America.

711. 2. *C. Fulvus* (the Yellow Paca.) Like the last, only with the ground colour yellow.

*Cuniculus Paca, Briss. Règ. Anim. 145. Cælogenus Fuscus, F. Cuvier. Paca Femelle, Buff. x.*

Icon. *Buff. l. c. pl. 43. Annales du Mus. t. x. pl. 9. Ency. Méthod. t. 65, f. 4.*

Inhabits South America.

ORDER V.—EDENTATA.

No incisive teeth in general; canines in some, but not in all; some of the genera with cheek-teeth only, and some

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perfectly edentatous; toes varying in number, and generally armed with great nails; orbits and temporal fossæ united.

*Food* various, vegetable for some of the genera, insects and flesh for others.

*Habits* various, generally inactive.

*Inhabits* South America, Central Africa, the Indian Islands, and New Holland.

### SECTION I. *E. Tardigrada* or Sloths.

#### Genus I.—BRADYPUS.

Incisors  $\frac{0}{0}$ ; canines  $\frac{1}{1}$ ; cheek-teeth  $\frac{1}{1} = 18$ ; canines larger than the cheek-teeth, pyramidal, and pointed; cheek-teeth cylindrical; head small; muzzle truncated; neck short; nostrils at the extremity of muzzle; anterior extremities longer than the posterior, with two or three toes armed with strong nails; fur harsh and long; intestines short; no cæcum; arteries of limbs commence by infinite ramifications, which finally unite.

712. 1. *B. Tridactylus* (the Three-toed Sloth.) Three nails to all the feet; has nine cervical vertebræ; gray, generally spotted on the back, brownish, or white; soles of the feet hairy; fur harsh.

Ignavus Arcthopithecus, *Gesner. Quad.* 869. Papio, 2. *Johnston.* Bradypus Tridactylus, *Lin.* Tardigradus, *Briss. Règ. Anim.* 34. Cuaikare, *Barrere.*

Ai, *Marcgrave, Brazil,* 221. Sloth, *Edward's Av.* 220.

Icon. *Johnston, tab.* 61. *Buffon, XIII.* 5. and 6. *Edwards, Shaw, &c. Ency. Méthod. t.* 25, f. 1. *Penn. Quad. t.* 91.

Inhabits all South America.

The type of F. Cuvier's genus *Acheus*, and considered as the true Bradypus by Illiger, and most succeeding authors.

*Obs.* The Ai seems to vary considerably as the Spotless Ai, the Yellow-faced Ai, the Collard Ai (treated as a distinct spe-

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oites by Desmarest), the Ash-coloured Ai, and others mentioned in the Supplement, and figured in this work.

713. 2. *B. Didactylus* (the Unau.) Two long nails only on the fore feet; lower jaw rather pointed; generally of a brownish-gray colour; and from two to three feet long; soles of the feet naked.

*Tardigradus Ceylonicus* Catulus, *Seba Thes.* L. 54. *Bradypus Didactylus*, *Lin.* *Simia Personata*, *Klein Quad.* 42. *Chælopus*, *Illig. Prod.*

Unau, *Buffon*, XIII. Two-toed Sloth, *Pen. Quad.* 242.

Icon. *Seba*, l. c. *Buff. l. c. pl.* 1. *Schreb. tab.* 65.

Inhabits South America.

*Obs.* For notice of the Little Unau of Buffon, and other varieties, see Supplement. This is the type of Illiger's genus *Chælopus*, and *Bradypus* of F. Cuvier, and the Unaus of Gray, in the *Medical Repository*.

SECTION II. *E. Effodientia*, or *Digging Edentata*.

Genus II.—DASYPUS.

Incisive teeth  $\frac{0}{0}$ ; or  $\frac{2}{2}$  canines  $\frac{0}{0}$ ; cheek-teeth varying in the several species in all from 28 to 68: these teeth cylindrical, separate, and without enamel on the inner side; head long, mouth small, tongue partially extensible; body altogether covered with a shell or plate armour; five toes to the hind-feet, four or five to the fore-feet, with long nails for digging; mammæ two or four; tail rather long, round; stomach simple, intestines without cæca.

Living in woods on roots and putrid animals, rolling themselves up, for protection. Confined to the warm parts of South America.

714. 1. *D. Apar* (the Apara, or Three-banded Armadillo.) Cheek-teeth  $\frac{3}{3}$ ; generally with three moveable transverse bands to the body; tail short and flat; five toes on all the feet.

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*Dasypus Tricinctus*, *Lin.* Armadillo Orientalis, *Bris.* *Rég. Anim.* 38. *D. Trachyurus Fischer.* *Zoon.* Toly peutes, *Illiger, Prod. Tatusies, F. Cuv.*

Tatu Apará, *Marc. Brasil*, 232. Tatou Apar, *Buff. t. x.* Tatou Mataco, or 8th Tatou, *D'Azara, Quad of Paraguay* II. 202. Three-banded Armadillo, *Pennant, Quad.* 246.

Icon. *Schreb. tab.* 71.

Inhabits South America about Brazil and Paraguay.

The type of *F. Cuvier* genus *Tatusies* and *Illiger's Toly-pentes*, characterized by their having no teeth in the inter-maxillary bone.

The *Dasypus Quadricinctus* of Linnæus, the *Armadillo Indicus* of Brisson, and the *Cheloniscus*, of Colon, appears to be allied to, if not identified with, this species.

715. 2. *Dasypus Peba* (the Peba.) Cheek-teeth  $\frac{4}{3}$ ; tail round, with rings nearly its whole length, and almost as long as the body; body with seven, eight, or nine mobile bands; plates of the shield small, rounded; those of the bands rectangular; ears very long; teats four. About two feet long.

*Dasypus Peba*, *Desmarest. Mam.* 368. *D. Septemcinctus*, *D. Octocinctus*, and *D. Novemcinctus*, *Lin.* *D. Serratus*, *Fischer. Zoonom.* Armadillo Brasilianus, *Bris.* 40. *A. Mexicanus*, *Bris.* 41. *A. Guyanensis*, *Bris. Rég. Anim.* 42.

Cachicame, *Buff. Hist. Nat.* x. Tatou noir, or 5th. *D'Azara Parag.* II, 175. Tatouhou, *Guaranis.* Tatu Peba. *Marc. Brasil.* 231. Nine, eight or seven-banded Armadillo, *Penn. Quad.* Pigheaded Armadillo, *Grew.*

Icon. *Ency. Méthod. t. 27, f. 2, t. 27, f. 1.* *Buffon Hist. Nat. x. t. 37.* *Schreb. t. 72, 73, 74, 76.*

Inhabits Brazil.

716. 3. *Dasypus Hybridus*, (Mule Armadillo.) Cheek-

teeth  $\frac{1}{1}$  ?; tail round, nearly half as long as the body; nose long; ears large; legs short; shield with six or seven moveable bands.

*Dasyus Hybridus*, *Desmarest, Nov. Dict. Hist. Nat.* xxxii. 492. *Fischer, Zoog.*

Tatou Mulet, *Azara, Paragua*, II. 288.

Icon —

Inhabits Brazil.

717. 4. *Dasyus Giganteus* (Giant Tatou.) Cheek-teeth  $\frac{1}{1}$   $\frac{1}{1}$ ; tail round, half as long as the body, covered with plates; shield with twelve or thirteen bands, composed of long scales; ears small; head rather broad; muzzle long; claws very strong.

*Dasyus Gigas*, *Cuv. Règ. Anim.* I. 221. *Dasyus Giganteus*, *Desmarest, Mamm.* 269. *Fischer, Zoog.* *Dasyus Maximus*, *Gmelin.*

Grand Tatou, *Azara, Parag.* II. 132. Giant Armadillo, or Greatest Armadillo.

Icon. *Buffon Hist. Nat.* x. t. 41.

Inhabits Paragua.

This animal is the type of F. Cuvier's genus *Priodontes*, characterized by the very great number of its teeth, &c.

718. 5. *Dasyus Tatouay* (the Twelve-banded Armadillo.) Cheek-teeth  $\frac{1}{1}$ ; tail round, less than half the length of the body, covered with scattered tubercles; shield, with twelve or thirteen moveable bands, formed of broad rectangular plates; ears large; head rather convex; muzzle long. About two feet three or four inches long.

*Dasyus Unicinctus*, *Lin. Sys. Nat.* D. Duodecemcinctus, *Gmelin.* D. *Dasycerus*, *Fischer, Zoogn.* Armadillo Africanus, *Briss. Règ. Anim.* 43. Tatu Mastelinus, *Ray*, 235.

Kabasson, *Buffon, Hist. Nat.* x. ? Tatou Tatouay, *Azara*,

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*Parag.* 11. 155. Weasel-headed Armadillo, *Grew*. Eighteen and twelve-banded Armadillo, *Penn. Quad.*

Icon. *Buffon, Hist. Nat.* x. t. 40. *Ency. Méthod.* t. 27, f. 3. *Seba.* t. 30. *Schreb.* t. 75. *Shaw, Zool.* 1. t. 83. *Penn. Quad.* t. 93.

Inhabits Brazil.

719. 6. *D. Sexcinctus* (Six-banded Armadillo.) Incisive teeth  $\frac{3}{3}$ , canines  $\frac{0}{0}$ ; cheek-teeth  $\frac{11}{11}$ ; six or seven moveable transverse bands; tail round, half as long as body; five toes to all the feet.

*Dasyppus Sexcinctus*, and *D. Octodecemcinctus*, *Lin. S. N.*  
*D. Flavipes*, *Fisher's Zoogn.*

Encoubert, *Buff. Hist. Nat.* x. Tatou, *Belon, Obs.* 211. Tatou Poyou, *Azara, Hist. Parag.* 11. 142. Weasel-headed Armadillo, *Grew, Mus. Gresh.* Cirquineou, *Buffon, Hist. Nat.* x. Six-banded and twelve-banded Armadillo, *Penn. Quad.* 249.

Icon. *Buffon, Hist. Nat.* x. t. 42. *Suppl.* 11. t. 57. *Ency. Méthod.* t. 26, f. 4. *F. Cuv. Mam. Lithog.* vi. t. *Penn. Quad.* t. 93.

Inhabits Paragua.

The type of *F. Cuvier's* genus *Tatous*, or Armadillos with incisive teeth.

720. 7. *Dasyppus Villosus* (Hairy Armadillo) Cheek-teeth  $\frac{11}{11}$ ; tail rather more than half as long as the body, ringed at the base; shield edged with serrated scales, furnished with six or seven moveable bands, formed of rectangular plates; ears moderate; frontal plate forming irregular scales, with the edge between the ears and the eye acute and prominent; hair very abundant, long, and brown.

*Dasyppus Villosus*, *Desmarest, Nouv. Dict. Hist. Nat.* xxxii. 489.

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Tatou Velu; *Azara, Paragua*, 11. 164.

Icon. — ?

Inhabits south side of the river Plata.

721. 8. *D. Minutus* (the Pichiy.) Cheek-teeth? tail round, ringed at the base, nearly half as long as the animal; shield tooth-edged, with six or seven bands, formed of rectangular plates; ears very small; sharp frontal plates, formed of smooth irregular scales, cut in on the sides over the eyes, but not over the ears; hair very abundant on the lower part of the shell.

*Dasypus Minutus, Desmarest, Mam.* 371.

Tatou Pichiy, *Azara, Paragua*, 11. 192.

Icon. *F. Cuv. Mam. Lithog.* 1.

Inhabits Buenos Ayres.

*Obs.* D'Azara observes that there is another kind, which he could not get a specimen of, found in Paragua.

Genus III.—ORYCTEROPUS.

Incisive teeth  $\frac{0}{0}$ ; canines  $\frac{0}{0}$ ; cheek-teeth  $\frac{3}{3}$ , separate, formed of bony substance, traversed longitudinally by a number of parallel tubes; head elongated; four toes before, and five behind, with the hind-feet plantigrade; nails very thick and like hoofs. The tarsi and metatarsi very like those of the *Pachydermata*.

722. 1. *O. Capensis* (Cape Orycteropus or Ant-eater.) Pale gray, inclining to red on the flanks; feet deep brown; general appearance pig-like. As big as a badger.

*Myrmecophaga Afra, Pal. Miscel.* vi. 64. *Myrmecophaga Capensis, Gm. Orycteropus Capensis, Illiger, Cuv. &c.*

*Cochon de Terre, Kolbe, Descript. de Cap.* Cape Ant-eater, *Pen.* Hardvark or Ground Hog of the Colonists.

Icon. *Buff. t.* 6, *pl.* 3. *Allamand, Sup.* v. *f.* 11.

Inhabits South Africa, near the Cape.

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Genus IV.—MYRMECOPHAGA.

Perfectly toothless ; head elongated ; muzzle tapering to a point ; tongue protractile ; all the toes united to the root of the nails, four before and five behind, or two before and four behind, armed with strong digging nails ; mammæ two pectoral, or two pectoral and two ventral ; tail sometimes prehensile.

723. 1. *M. Jubata* (Great or Maned Ant-eater.) Four toes before, five behind ; tail furnished with long flowing hair ; with an oblique black line on the shoulders ; muzzle formed like a trumpet. Upwards of four feet long.

*Myrmecophaga Tridactyla*, *Lin. ed.* 10. *M. Jubata*, *ejusdem ed.* 12. *Tamandua Gangu Brasiliensibus*, *Johnston, Quad.* 136. Bear Ant-eater, *Dampier, Voy. Tamanoir, Buff. t. x.* Gnouroumy or Yogouy, *D'Azara, Paraguay.*

Icon. *Marcg. Brasil. Johnston, l. c. tab. 62. Buff. l. c. and Supp. III. f. 45. pl. 19. Schreb. tab. 67. Shaw, vol. I. pl. 19.*

Inhabits South America.

724, 2. *M. Tamandua* (the Tamandua.) Four toes before, five behind ; tail round, naked toward the point, prehensile ; varying much in colour, but most commonly pale gray, with a band on the shoulders. About two feet long.

*Tamandua Brasiliensibus Marcg. Brasil. Myrmecophaga Tetradactyla et Tridactyla, Lin. M. Nigra, D'Azara, Voy. to Paraguay.*

*Tamandua, Buff. t. x. Cagouré, D'Azara, Quad. of Paraguay. Little Bear Ant-eater of the Spanish Americans.*

Icon. *Schreb. tab. 66. D'Azara, Voy. Marcgr. Bras. 225. Inhabits South America.*

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Var. A. Yellowish-gray; transverse band, visible only in certain directions.

Var. B. Like the last, but with black before the eyes.

Var. C. Yellow, with an oblique line on each shoulder.

Var. D. Yellow, with the crupper, flanks, belly, and shoulders, bare.

Var. E. Uniformly yellow.

Var. F. Black.

Var. G. Pale yellow, with a brown mantle, figured in this Work under the name of the Ursine Ant-eater.

Var. H. With an annulated tail, figured in this Work under the name of Tamandua; annulated var. It is probably the *M. Annulata* of Desmarest, from Krusensten's Voyage.

Var. I. With a triangular brown spot about the eyes, and tail annulated.

725. 3. *M. Didactyla* (Little or Two-toed Ant-eater.) Only two nails on the fore-feet, one of which is very large; four on the hind-feet; tail long and prehensile, naked underneath at the extremity; fur wholly yellow, with a dorsal deeper stripe; length of body seven or eight inches.

*Myrmecophaga Didactyla*, *Lin. M. Minima*, *Brisson, Règn. Anim.* 28.

Little Ant-eater, *Edwards, Glean.*

Icon. *Buff. t. x. pl. 30. Edwards, l. c. pl. 200. Shaw, Zool. vol. I. pl. 52. Schreb. tab. 66.*

Inhabits South America.

Var. A. Without the dorsal stripe. The *M. Unicolor* of *Geoffroy's MSS.*

*Obs.* The *Tamandua* of *Buff. Supp.* III. 36, and of *Shaw* and *Boddaert*, is a factitious species.

Genus V.—MANIS.

Toothless; body elongated, and reptile-like; muzzle

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pointed; tongue protractile; feet with five toes formed for digging; tail long; body covered with hard scales or plates; and capable of being rolled up into a spherical shape.

726. 1. *M. Crassicaudata* (the Short-tailed, or Indian Manis.) Tail shorter than the body, thick at the base; scales forming eleven longitudinal series, about one foot ten inches long in the body; tail one foot five inches.

Phattager, *Ælian*. *Lacertus Indicus Squamomus*. *Bontius Ind.* 60. Tatu Mustelinus, *Klein, Quad.* 47. Manis Pentadactyla, *Lin.* Manis Brachyura, *Erzleben*. Manis Pangolinus, *Bodd.* Manis Acroura, *Desmarest, Ency. Méthod.*

Grand Lezard Ecaillé, *Perrault, Anim. t. III.* 87. Pangolin, *Buff. x.* 34. Pangolin a queue courte, *Cuv.* Broad-tailed Manis, *Pennant? Quad.* 254.

Icon. *Pennant, l. c. tab.* 87. *Schreb.* 54. *Buff.* 34. *Schreb. tab.* 69. *Seba, Thes. i.* 54. *Bontius*, 60. *Perrault, Anim. III. f.* 17.

Inhabits Bengal and the Indian Islands.

*Obs.* The specimen of the Manis in the Paris Museum, which Desmarest has described under the name of *M. Javanica*, accords with this, except in having seventeen ranges of scales.

727. 2. *M. Longicaudata* (Long-tailed, or African Manis.) Tail twice the length of the body, turned upward, compressed; scales armed with three points on their edge, smaller than the preceding.

*Lacertus Squamosus Peregrinus*, *Clus. Exot.* 374. Manis Tetradactyla, *Lin.* Manis Macroura, *Erzleb.* Manis Phatagus, *Bodd.* Pholidolus Longicaudatus, *Briss. Rég. Anim.* 31. Manis Longicaudata, *Geoff.*

Scaly Lizard, *Grew.* Lezard de Clusuis, *Perrault*, III. 89. Phatagin, *Buff. x.*

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Icon. *Buffon*, pl. 35. *Schreb. tab.* 70. *Pennant*, *Quad.* f. 94.

Inhabits Central Africa.

*Obs.* This or a similar species is figured in *Marsden's Sumatra*, t. 18.

Genus VI.—CHLAMYPHORUS.

Incisors  $\frac{2}{1}$ ; canines  $\frac{2}{1}$ ; cheek-teeth  $\frac{2}{1}$ ; the two first pointed, the rest flat at top, and cylindrical in form; shell composed of a series of transverse plates; toes five before, and five behind, with long laterally-compressed nails; tail short and turned downward; lower-jaw articulated almost in the manner of the Ruminantia and Pachydermata.

728. 1. *C. Truncatus*. Body covered with a leather-like shell, abruptly truncated behind, white silky hair underneath; tail short, and bent under the abdomen. Length about five inches.

*Chlamyphorus Truncatus*, *Harlan*, *New York Lyceum of Nat. Hist.*

Icon. *Harlan*, l. c. and *Zoological Journal*, vol. II.

Inhabits North America.

SECTION III.—*Monotrema*, or *Monotremes* \*.

Genus VII.—ECHIDNA.

Toothless, but the palate aculeated; muzzle flat, narrow, and small; tongue protractile; eyes small; external ears, none; paws short, and five toes; a moveable sharp pointed spur on the inner side of the hind-legs, through which an acrid secretion is ejected; tail short; body covered with spines; large marsupial bones. Body capable of a spherical shape.

\* The location of these two anomalous genera, in the present class, places the systematist in the dilemma of admitting Mammalia without teats, which have not as yet at least been discovered.

SYNOPSIS OF THE

729. 1. *E. Hystrix* (the Spiny Echidna, or Porcupine Ornithorynchus.) Upper part of body covered with thick spines, without hairs; about the size of the Hedgehog; under part, with bristly hair; deep brown spines, tipped black.

Ornithorynchus Hystrix, *Home, Phil. Trans.* 1802. Myrmecophaga Aculeata, *Shaw, Gen. Zool. t.* 175.

Porcupine Ant-eater, *Naturalist's Miscel.* 1792. Aculeated Ant-eater, *Pennant, Nat. Mis. f.* 109.

Icon. *Home, l. c. Shaw, l. c. pl.* 54.

Inhabits New Holland.

730. 2. *E. Setosus* (Bristly Echidna, or Ornithorinchus.) Body covered with stiff hairs, among which on the back, are to be found, on close inspection, some short spines.

Alter Ornithorynchus Hystrix, or *O. Setosus, Home, Phil. Trans.* 1802. *Shaw, Gen. Zool.*

Icon. *Home, l. c. pl.* 13. *B. Bull. Soc. Phil.* III. *f.* 15.

Inhabits New Holland.

Genus VIII.—ORNITHORYNCHUS.

Incisors  $\frac{2}{2}$ ; canines  $\frac{2}{2}$ ; cheek-teeth  $\frac{4}{4}$ , which are merely fibrous, and are not fixed in any bone, but only in the gum; a sort of horny beak, resembling a duck's bill; nostrils contiguous, opening at the end of the upper beak, or mandible; cheek-pouches; paws pentadactylous, formed for swimming, and united behind by a web, with a spur, behind in the male, as in the last genus.

731. 1. *O. Rufus* (the Red Ornithorinchus.) Uniformly reddish-brown above, lighter underneath.

Platypus Anatinus, *Shaw, Nat. Miscel.* Ornithorynchus Paradoxus, *Blumem. Manuel, t.* 165. *O. Rufus, Peron and Leseur Voy.*

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Duck-billed Platypus, *Shaw, Gen. Zool.* 1. 229. Water Mole of the Colonists.

Icon. *Nat. Miscel.* and *Gen. Zool. Blumem.* l. c. pl. 14. *Peron, l. c. pl.* 34.

Inhabits New Holland.

732. 2, *O. Fuscus* (Brown Onithornchus). Fur flat, crisp, and blackish-brown above.

Ornithorynchus Fuscus, *Peron and Leseur Voy. Teras Aust.* *O. Crispatus, Wernerian Trans.*

Icon. *Peron Atlas, t.* 34, f. 1, 5, 6. *Leach, Zool. Misc. t.* 111.

Inhab. New Holland.

ORDER VI.—PACHYDERMATA.

SKIN very thick, whence the Order is named. Some genera partially edentatous, others with the three sorts of teeth; quadrupedal, generally with hoofs, and the toes varying in number; stomach simple; without clavicles.

Herbivorous or omnivorous.

Habits various.

Inhabits the temperate and torrid zones.

*Obs.* Three families or sections of this Order have been marked:—1. The Proboscidiana, including the Elephants. 2. The Pachydermata, including all the remaining genera in the Order, except 3. The Solidungula, or Horses.

There are several extinct genera belonging to this Order known only by their fossil remains.

Genus I. ELEPHAS.

Incisives enormously elongated, and called tusks  $\frac{2}{3}$ ; canines  $\frac{0}{0}$ , cheek-teeth  $\frac{2}{2} = 10$ . Incisives slightly arched toward their extremity, composed of ivory, incased with a crust of enamel; cheek-teeth composed of vertical and

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transverse lamina, springing up from the bottom of the jaw obliquely forward; five toes on all the feet; nose greatly elongated, forming a long cylindrical proboscis, moveable with admirable precision in all directions with a sort of finger or organ of tact and holding, at the end; body very large and massive; head very large; tail rather short, pencillated at the end; mammæ two; nasal fossæ greatly elevated.

733. 1. *E. Indicus* (Indian Elephant.) The head oblong, forehead concave; ears large, but less than those of the African species; four hoofs on the hind feet; crown of cheek-teeth marked by transverse undulating bands of enamel; ordinary height about ten feet.

Ελεφας, *Aristot. Hist. Anim.*

*Elephas Maximus*, *Lin.* *E. Indicus*, *Cuv. Mem. de l'Inst. t. 2.*

*Icon. Cuv. Menag. du Mus. Encyclopedia Metropolitana.*  
Inhabits all Southern Asia and the large Islands.

734. 2. *E. Africanus* (African Elephant.) Head round; forehead convex; ears very large; three hoofs to the hind-feet; crown of cheek-teeth marked by lozenge-shaped ridges of enamel. Less than the Asiatic species.

*Elephas Maximus*, *Lin.* *E. Capensis*, *Cuv. Mem de l'Institut.* *E. Africanus*, *ejusdem, Règn. Anim.*

*Icon. Gesner, Quad.*

Inhabits Africa.

*Obs.* This is probably the Elephant of the Greeks and Romans. The distinctness of the two species was discovered by the Baron Cuvier.

## Genus II. HIPPOPOTAMUS.

Incisors 4; canines  $\frac{1}{2}$ ; cheek-teeth  $\frac{7}{7}$ , = 40; upper incisors thick, short, conical, bent inward, the lower cylin-

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dricul, directed obliquely forward, the intermediate being the strongest; the canines greatly developed, forming strong tusks; the three or four first cheek-teeth conical and simple; head thick and square; muzzle very large; eyes and ears small; body very thick and heavy; legs short, terminated with four toes; tail short; mammaræ two, ventral; skin without hair, except at the extremity of the tail.

735. 1. *H. Amphibius* (the Hippopotamus.) Dark dirty-brown, body very heavy, and low on the legs; ears far back; end of the jaw very wide to accommodate the enormous teeth.

*Ποταμος of the Greeks.* Hippopotamus *of the Moderns*; *H. Amphibius, Lin.*

Icon. *Prosper, Alpin Egypt*, i. 22 and 23. *Buff. t. XII.* 3 and 6. *Sup. III.* 28, and *VI.* 4 and 5.

Inhabits nearly the whole of Africa.

*Obs.* Desmoulins has divided this species into two distinguished by the character of the skull of specimens from different parts of Africa. These he names *H. Capensis*, and *H. Senegalensis*.

### Genus III. Sus.

Incisors  $\frac{3}{3}$  or  $\frac{4}{4}$ ; canines  $\frac{1}{1}$ ; cheek-teeth  $\frac{7}{7}$ . The lower incisors directed obliquely forward; the upper conical; the canines increasing during the whole life of the animal, growing out of the mouth, and frequently bending toward the end; cheek-teeth simple and tuberculous; four toes on all the feet, the two middle ones only touching the ground; nose elongated, cartilaginous, and furnished with a particular bone to the snout; mammaræ twelve; body covered with a thick skin, furnished with stiff hair.

736. 1. *S. Scropha* (the Hog.) When wild, generally of a blackish-gray, striped with bands during nonage;

SYNOPSIS OF THE

tusks strong, triangular, and directed almost laterally. Varying infinitely in a domestic state.

*Καρκος*, *Aristot. Anim.* II. *Sus Ferus*, and *Porcus*, *Plin. Hist. Nat.* VIII. ch. 51. *Sus Aper*, *Briss.* *Sus Scrophia*, *Lin.*

*Le Sauglier* and *Morcassin*, *Buff.* v.

*Icon. Buff. l. c. pl.* 14 and 17.

Inhabits almost all the habitable world.

*Obs.* The principal of the many varieties of this species are noticed in our supplementary observations upon it. One is peculiar for being solidungulous.

737. 2. *S. Babyrussa* (the Babyroussa.) Tusks not so thick as in the other species, but more elongated and curled; particularly those of the upper jaw; legs long.

*Υς τετραχειρος*, *Ælian, Ani.* *Babyroussa*, *Bontius, Ind. Orient.* *Sus Babyrussa*, *Lin.* *Hog-deer of Travellers.*

*Icon. Bontius, l. c. Buff. XII.* 48, and *Sup. III.* 12.

Inhabits the Indian Islands.

738. 3. *S. Larvatus* (Masked Boar.) Tusks moderate, angular, and directed laterally; a fleshy tubercle on each cheek.

*Sus Larvatus*, *F. Cuvier.* *Sus Africanus*, *Schreb.*

*Sanglier de Madagascar*, *Daubenton, Description du Cabinet du Roi.* No. 1885. *Sanglier a Masque*, *Cuvier, Règn. Anim.*

*Icon. Schreb. tab.* 327. *Daniel's African Scenery. f.* 22.

Inhabits Madagascar and the neighbouring parts of Africa.

*Obs.* The *S. Koiropotamus* and the *S. Papuensis*, or Pig of New Guinea, have very lately been noticed. The former by a figure inserted by *M. Desmoulin* in the *Classical Dictionary of Natural History*, and the latter by *Lesson* and *Garnot* in *Captain Trecinet's Voyage.*

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### Genus IV.—PHASCOCHÆRUS.

Incisors  $\frac{2}{2}$ ; canines  $\frac{1}{1}$ ; cheek-teeth  $\frac{4}{4}$ ; the two intermediate lower incisors smaller than the rest, and apart from each other; canines or tusks of enormous size, like horns, those in the upper jaw the longest; cheek-teeth formed of clustered cylinders, first small, the rest very large in the upper jaw; the three first in the lower jaw small and apart, the rest very large; toes like *Sus*, large fleshy excrescences on the cheeks.

739. 1. *P. Africanus* (the Æthiopian Boar.) Tusks round, thick, directed sideways and upwards; a large fleshy lobe on each cheek.

Aper Æthiopicus, *Pall. Misc. and Spic. Zool.* 11. *Sus Æthiopicus*, *Gm.* *Sus Angalla*, *Bodd.*

Emgalo or Engalo, *Barbot, Guin.* 487. Sauglier du Cap, Vert or Sanglier d'Afrique, *Buff. Hist. Nat.* xv. 148, and xiv. 409, and *Supp.* 111.

Icon. *Pallas, Misc. tab.* 2, and *Spic. Zool.* 11—1. *Buff. Sup.* 111. *pl.* 11.

Inhabits Africa.

*Obs.* The French Zoologists make but one species of the African Boar; but see our observation at page 409, and the figure.

### Genus V.—DICOTYLES.

Incisors  $\frac{3}{3}$ ; canines  $\frac{1}{1}$ ; cheek-teeth  $\frac{3}{3}$ . Canines or tusks not projecting out of the mouth; other teeth like those of *Sus*; four toes before, three behind; the external little toe of the hind feet of the swine wanting in this species; an opening on the back, from which is extracted a fetid humour, secreted within; tail a mere tubercle.

740. 1. *Dicotyles Torquatus* (Collared Peccary.) Hair

## SYNOPSIS OF THE

of the fur annulated black and white; a large blackish oblique band descending from the shoulders to the ribs.

*Sus Tajassu*, *Lin.* *Dicotyles Torquatus*, *F. Cuv. Dict. de Sciences Naturelles*, ix. 568.

*Pecari*, *Buff.* x. *Pecari* or *Tajassou*, *Daubenton Descrip. Anatom.* *Taytetou*, *D'Azara, Quad. du Paraguay*, i. 31.

*Icon. Buff.* l. c. *pl.* 3. *F. Cuvier, Mam. Lithog.*

Inhabits eastern side of South America.

741. 2. *D. Labiatus* (White-lipped Pecary.) Fur uniformly blackish-brown, with white round the mouth.

*Sus Tajassu*, *Lin.* *Dicotyles Labiatus*, *F. Cuv. Dict. des Sci. Nat.* ix. 519. *Taguicati*, *D'Azara, Quad. of Paraguay*, i. 25.

*Icon. F. Cuv. Mam. Lithog.*

Inhabits Paraguay, and probably other parts of South America.

### GENUS. VI.—RHINOCEROS

Incisors  $\frac{6}{6}$ , or  $\frac{2}{2}$ , or  $\frac{4}{4}$ ; canines  $\frac{0}{0}$ ; cheek-teeth,  $\frac{7}{7}$  or  $\frac{8}{8}$ . The incisors unequal among themselves when they exist; the anterior cheek-teeth small; the posterior increasing progressively; the eyes small, lateral, and placed far back, like the ears; one or two horns placed on the nose; three toes on all the feet; tail short, laterally compressed near the end; mammæ two; inguinal skin very thick, nearly without hair, and forming, in some species, thick and heavy folds.

742. 1. *R. Indicus* (Indian Rhinoceros.) Two incisors in each jaw, with a small tooth on each side of them in the upper jaw; one horn on the nose; skin forming several deep folds or plaits; length upwards of ten feet; height about five feet.

*Rhinoceros*, *Pliny*, t. iii. *ch.* 20, and xviii. *ch.* 1. *R. Unicornis*, *Lin.* *R. Indicus*, *Cuv. Menag.*

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Icon. *Buffon*, t. xi pl. 7. *Parson's Phil. Trans. Edwards's Gleanings*, pl. 221. *F. Cuv. Man. Lithog. Thomas's Phil. Trans.* 1800.

Inhabits India, especially the banks of the Ganges.

*Obs.* Camper has described a rhinoceros with two incisors in each jaw, as distinct from this. *M. Cuvier* thinks it the same species, but *M. de Blainville* otherwise. He has called it *R. Camperis*.

743. 2. *R. Africanus* (African Rhinoceros.) No incisors in either jaw; two horns placed longitudinally on the nose; skin without folds or plaits. About the size of the Asiatic species.

Rhinoceros Bicornis, *Lin.* Africanus, *Cuv.*

Icon. *Buff. Sup.* vi. pl. 6. *Facycis Essai de Geologie*, t. 1. pl. 9 and 10.

Inhabits South Africa.

744. 3. *R. Bicornis Sumatrensis* (Sumatran Two-horned Rhinoceros.) Four incisors, two large and two small in each jaw, and cheek-teeth  $\frac{3}{3}$ ; two horns on the nose; skin with slight indications of folds, and one large one on the shoulders.

Sumatran Rhinoceros, *Bell, Phil. Trans.* 1793.

Icon. *Bell, l. c. Shaw, Gen. Zool.* 1. pl. 62.

Inhabits Sumatra.

745. 4. *R. Sondaicus*. Teeth; one horn; body lighter than *R. Indicus*; skin with slight folds, and covered with occasional short stiff hairs.

Rhinoceros Sondaicus, *Cuv.* *R. Sumatranus*, *Raffles, Lin. Trans.*

Icon. *Horsfield's Java.*

Inhabits Sumatra.

## SYNOPSIS OF THE

746. 5. *R. Camus*. Teeth? undescribed horns two; muzzle truncated; skin without folds. Nearly double the size of the common two-horned species of Africa.

Rhinoceros Simus, *Burchell, Journal de Phys.*, June, 1817, and *African Travels*, 11. 75.

Icon. *Journal de Phys. l. c. Burchell's Travels*.

Inhabits Southern Africa.

*Obs.* A more complete description of this species is promised by Mr. Burchell.

Colonel Gordon indicated a species as new, which Allamand edited in his edition of Buffon. Blainville thinks it probably the Simus of Burchell.

## Genus VII.—HYRAX.

Incisors  $\frac{2}{1}$ ; canines  $\frac{2}{2}$ ; cheek-teeth  $\frac{7}{7}$ , = 32. Incisors large and bent, with a void space between them and the cheek-teeth; anterior cheek-teeth in the upper jaw, with flat triangular crowns, the others with the crown slightly concave; the posterior lower cheek-teeth with a transverse ridge dividing the middle of the crown; toes before, four or three, behind four; head large, with a slight muzzle; nostrils oblique; eyes small, with a large membrane; upper lip cleft; ears short, large, round; no tail; fur of two sorts, short and woolly, and long and silky; mammæ six, two pectoral, and four ventral.

747. 1. *H. Capensis* (Cape Hyrax.) Toes four on all the feet; grayish-brown above, whiter underneath; inside of ears white; length about two feet six inches, height about eight inches.

*Cavia Capensis*, *Pall. Misc.* 34. *Hyrax Capensis*, *Gm.*

Daman and Marmotte du Cap. *Buff. Sup. t.* vi. Klipdaas or Cape Badger of the Colonists.

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Icon. *Pallas*, l. c. pl. 3. *Buff. t.* vi. pl. 42 and 43; and  
iii. pl. 39.

Inhabits the Cape of Good Hope.

748. 2. *H. Syriacus* (Syrian Hyrax.) Differing from the South African species principally in having only three toes on the anterior feet, and long bristles or hairs dispersed over the upper part of the body.

Hyrax *Syriacus*, *Gmel.* *Askhkoko*, *Bruce's Travels.*  
*Bristly Cavy*, *Pen.* Daman Israel, *Buff. Sup.* iv. 276.

Icon. *Bruce*, v. f. 29, *Pen. Quad.* 68. *A. Schreb.* 211. *B.*  
*Buff. Sup.* vi. 63.

Inhabits Syria and Abyssinia.

Genus VIII.—TAPIR.

Incisors  $\frac{1}{2}$ ; canines  $\frac{1}{2}$ ; cheek-teeth  $\frac{1}{2}$ ; intermediate incisors shorter than the exterior, which appear like canines; canines moderate, a void space between them and the cheek-teeth, the crowns of which have two transverse ridges; fore-feet with four toes, the posterior with three, each toe with a short round hoof; nose elongated, forming a small moveable proboscis, but not prehensile like that of the Elephant; eyes small, ears long and mobile; tail short; mammae two, inguinal.

749. 1. *T. Americanus* (American Tapir.) Head laterally compressed; a ridge from between the shoulders along the neck to between the eyes, which has a slight mane in the male; colour dirty-brown; length upwards of six feet, height about five feet.

Tapurete Brasiliensibus, *Marcg. Brazil*, 229. *Sus Aquaticus Multisulcus*, Tapir Mapouri, *Barrère*, pa. 160. *Hippopotamus Terrestris*, *Lin.* *Hydrochærus Tapir*, *Erzleb.* Tapir Americanus, *Gm.*

## SYNOPSIS OF THE

*Tapilules*, *Thevet. Cosmog.* II. 987. *Danta*, *Nieremb. Hist. Nat.* 187. *Antes*, *Menh. Brasil.* 23. Mountain Cow, *Dampier. Anta in Brasil.* Niborèbi, *in Paraguay.*

Icon. *Marcg. l. c. Dampier, l. c. Tapir, Buff.* x1. 43.

Inhabits South America very generally.

750. 2. *T. Malayanus* (Malay Tapir.) Black or dirty-brown, with a large white patch on the posterior part; when young, black, spotted, and striped with fawn-colour, or white.

*Tapir Malayanus*, *Raffles, Lin. Trans.* T. *Sumatrensis*, *Gray's Med. Repository.* T. *Indicus*, *Desmarest.*

*Mariba*, *F. Cuv. Mam. Lithog.*

Icon. *Horsfield, Zool. Researches, F. Cuv. l. c.*

Inhabits Sumatra.

## Genus IX.—EQUUS.

Incisors 2; canines 1; or 2; in the females of some species; cheek-teeth 2. Cheek-teeth furrowed on each side with flat crowns and several ridges of enamel. Between the canines and cheek-teeth is a void space; upper lip capable of considerable motion; eyes large; ears rather large, pointed, and erect; feet with a single apparent toe, covered with a thick hoof; tail with long hair, or with a tuft at the extremity; mammæ two, inguinal; stomach simple and membranaceous; intestines and cæcum very large.

751. 1. *E. Caballus* (the Horse.) Not known in its pristine state. May be characterized specifically by its long tail with long hair all over, long mane, and want of the humeral stripe.

\*ἵππος, *Aristot. Hist. Equus, Pliny.*

Icon. Most Zoological Works, with figures.

Inhabits the temperate climates of the Old World.

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752. 2. *E. Hemionus* (the Dziggtai). Light-bay in summer, redder in winter, mane and dorsal line black; tail terminated by a black tuft. As big as a moderate horse.

*Equus Hemionus Dziggtai Dictus, Pallas, Nov. Can. Petrop.* VII. 394. Probably the Wild Mule of antiquity.

Icon. *Pallas, l. c. pl. 7.*

Inhabits the Deserts of Mangolia.

753. 3. *E. Asinus* (the Ass.) The Wild Ass (which is presumed to have sprung from emancipated tame individuals) is as big as a moderate-sized horse, with ears not quite so long as in the domesticated race. Gray or brownish-yellow, with a brown dorsal band, and one on each shoulder. The domesticated races vary but little in colour, being generally gray, with a black humeral stripe, and long hair at the end only of the tail.

"*Ovos, Aristotle. Onager, Pliny. Equus Asinus, Lin. Kaidon of Southern Russia.*

Common Ass of Authors.

Icon. *Johnston's Quad. 16, Buff. IV. 11, &c.*

Inhabits

754. 4. *E. Quagga* (the Couagga). Head and neck dark-brown, with transverse grayish-white stripes; the under part and legs whiter; tail terminated with long hairs. About four feet high at the withers.

*Equus Quagga. Gm. Asinus Quagga, Gray's Zool. Journ. Quaccha, Pen. Quad. Couagga, Buff. Sup. VII. Female Zebra, Edwards's Gleanings. Opeacha, Masson.*

Icon. *Buff. l. c. pl. 7. Young, Edwards, l. c. pl. 223. Cuv. Menag. du Mus.*

Inhabits Southern Africa.

755. 5. *E. Zebra* (the Zebra.) White, with numerous brownish-black bands of more or less intensity, and lighter

SYNOPSIS OF THE

down the middle of each band. As big as a moderate horse.

*Equus Zebra*, *Lin.* *Zebra*, *Ray.* *Zebra Indica*, *John.* *Equus Brasiliensis*, *Jacob. Mus. Règn.* *Hippotigre*, *Dion. lib. 77.*

*Icon. Jacob. l. c. pl. 3.* *Buffon, t. xii. pl. 1, and 2. Cuv. Menag. du Mus.*

Inhabits Southern, and probably nearly the whole of Africa.

756. 6. *E. Montanus* (the Dauw, Mountain, or Berg Paart.) Covered with pure single black and white stripes down to the hoofs.

*Equus Montanus*, *Burchell's Travels.* *Gray, Zool. Journ.*  
*Icon. Gray, l. c. pl.*

Inhabits Southern Africa.

ORDER VII.—RUMINANTIA. *Pecora*, *Lin.*

*By Charles Hamilton Smith, Esq., F.R.S., &c. &c.*

**TEETH** of three sorts; incisors in the lower-jaw only, usually eight in number, opposed to a callosity in the upper-jaw; canines in some species in the upper-jaw, in others, in both, in most none; cheek-teeth or molars almost always six on each side, in both jaws; articulation of the jaw disposed for a grinding motion; no clavicles; extremities disposed for walking; the toes externally, two anterior, rudimentally in most, two posterior, all unguiculated, excepting the posterior of some. Single metacarpal and metatarsal bones to each foot; organs of digestion disposed for chewing the cud; four stomachs; intestines long; mammæ two or four, always inguinal; horny or osseous horns in the males, and often the females, of most species.

Food invariably vegetable.

SPECIES OF MAMMALIA.

Manners peaceable, residing in pairs, families or herds, in forests, or on the plains.

Inhabit nearly the whole earth, New Holland and Terra del Fuego, and smaller islands excepted.

The Order is divided into five tribes,

Camelidæ. Cervidæ. Giraffidæ. Capridæ. Bovidæ.

TRIBE I.—*Camelidæ*.

No horns; no succentorial hoofs; no muzzle; nostrils slit; upper-lip divided, separately moveable, and extensible; horny soles to the feet; toes covered with crooked ungular claws or nails; canines in both sexes; neck long; limbs long; lower abdomen drawn up under the pelvis, retromingent.

Genus I.—*CAMELUS*, Lin.

Incisors  $\frac{2}{2}$ ; canines  $\frac{1}{1}$ ; false molars  $\frac{1}{1}$ ; molars  $\frac{2}{2} = 36$ . Inferior incisors in trenchant quins, the superior lateral and cuneiform; canines conical, straight, robust; false molars on each side, separated from the other teeth; in the diastema, and uncinated; head long; chaffron convex; no sinus under the eyes; nostrils slit obliquely, and closing at pleasure; eyes prominent; ears small; pores at the back of the head; feet with toes only free, the rest united; neck bent; one or two hunches on the back much developed; callosities on the sternum, and flexures of the extremities; tail reaching to the tarsus; mammæ four; hair woolly; the ventriculus with membranous cells, one of which is very large to contain water; male organs slender, reversed in a state of repose; scaphoid and cuboid bones of the tarsus separated; stature very large; belong to the old continent.

757. 1. *C. Bactrianus* (the Bactrian Camel.) Two hunches on the back; colour generally brown.

## SYNOPSIS OF THE

*Κάμηλος Βακτριανός*, *Arist.* Camelus Bactriæ, *Plin.* C. Bactrianus, *Lin.* and *Auctor.* Chameau, *Briss. Buff. G.* and *F. Cuv.* Bactrian Camel, *Pent., Shaw.* Ditylus; of the Lower Empire, Werbljud, of the Slavonic. Deva Deve, of the Hunnic. Tjuja Tue, of Tartar Nations. Tong, Chinese.

Icon. *Buff. Pent. G.* and *F. Cuv.*

Inhabits Tartary, Persia, Turkey, China, domesticated.

758. 2. *C. Dromedarius* (the Arabian Camel.) One hunch on the back, colours pale brown, whitish and fawn.

*Κάμηλος Αραβίος*, *Arist.* Camelus Arabiæ, *Pliny.* C. Dromedarius, *Lin.* and *Auctor.* Dromedaire, *Buff. G.* and *F. Cuv.* Gemal Gemel, in the East Arabia, &c. Oont, India, *Shuttur*, Persia. *Geldowesi*, Turkish. The several races, Mahairy, Ashaary, &c. In Morocco Egin, female Nago.

Icon. *Buff. F. Cuv. An. Lithog.*

Inhabits Arabia, Turkey, Northern Africa, India, &c.; domesticated.

*Obs.* There appears to be a species distinct from the Bactrian and Arabian Camels, in the possession of the Rugere.

### Genus II.—AUCHENIA, Illig.

Incisors  $\frac{3}{4}$ ; canines  $\frac{1}{4}$ ; false molars  $\frac{1}{6}$ ; molars  $\frac{4}{2} = 32$ . Teeth in general resembling those of the Camel; nose slightly turned; no sinus at the back of the head; eyes large, clear; neck slender, vertical; ears long, pointed, moveable; toes protected with small hoofs, more free than in the Camels; sole of the foot shorter; no hunches on the back; tail short; two mammæ; callosities on sternum, and knees developed; male organs reversed; no vesicular appendices to the ventriculus; generic tone of colours pale purplish brown; belong to the New World.

SPECIES OF MAMMALIA.

759. 1. *A. Glama* (the Lama.) Head long; chaffron slightly arched, joining the forehead, without sensible interruption; back rather straight; fur composed of long soft hair, very abundant, variously coloured, but mostly brown, with a cast of purple and white; tail not much elevated.

*Elaphocamelus*, *Marcg.* Chameau du Perou, *Briss.* *Camelus Glama*, and *C. Lama*, *Auctor.* *Lama*, *Buff. G.* and *F. Cuv.* *Allocamelus*, *Gesner.* *C. Huanacus*, *Schreb.* *Guanaco*, *Shaw.*

Icon. *Buff. F. Cuv. Nobis* from life.

Inhabits Peru and Southern Andes; domesticated and wild.

760. \* 2. *A. Huanaca* (the Guanaco.) Head more pointed than the preceding; nose slightly arched; forehead covered with woolly hairs; lips less turned; ears longer; back slightly arched; tail erect, or reversed on back; abdomen more drawn up; fur short, coloured pale purplish-brown and buff, not so abundant; four feet at the shoulder; neck vertical. Confounded with *Lama*, of which perhaps it is only a variety.

*Cervo Camelus*, *Johnst.* Pennich-Cat, *Hern. Mex.* *C. Huanacu*, of *Schreb.* and *Shaw*, is a true *Lama*.

Icon. *Nobis* from life.

Inhabit the High Andes? Mexico; domesticated.

761. 3. *A. Paco* (the Paco.) Smaller by a fourth than the last; no callosities on sternum or joints; hair long and soft, abundant, mostly fulvous brown and gray; lips tumid; neck rather short.

*Paco*, *Lact.* *Paco Alpaco*, *Molina.* *Pacos*, *Pent. Ca-*

\* An asterisk before the number of the species of this Order, designates such as are not positively determined.

SYNOPSIS OF THE

melus Paco, Alpaca, *F. Cuv.* Guanaco of *Stewart. Trail*,  
*Mem. of Wern. Soc.* appears to be a variety of this.

Icon. *F. Cuv. Mamm. Lithog.*

Habitat. Peruvian and Chilian Andes ; domesticated and  
wild.

762. 4. *A. Vicugna* (the Vicugna.) Still smaller than  
the last, not three feet at shoulder ; lighter in form ; head  
shorter ; eyes large ; lips tumid ; body covered with very  
fine woolly hair ; colours pale vinous brown and buff.

*Camelus Laniger*, *Klein.* Vicognes, *Frezier.* La Vi-  
gogne, *Buff.* *Vicunna*, *Pent.* *C. Vicugna*, *Lin.* and *Auctor.*

Icon. *Buff.* *Nobis* from life.

Inhabit Peruvian Andes ; not reclaimed.

763. 5 \* *A. Araucana* (the Chilihuque.) Snout curved  
or arched ; pendulous ears and tail ; colours various ; prob-  
ably only a variety of the true Lama ; said to be the  
oldest domesticated race ; reduced by the Caciques of  
Chili.

*Camelus Araucanus.* Chilihuque, *Molina.*

Icon. —

Inhabit Chili.

764. 6. \* *A. Huemel* (the Huemel.) Size of an ass ; colour  
ashy ; voice neighing ; a very doubtful species.

*Equus Bisulcus.* Huemel, *Molina.*

Icon. —

Inhabit the Chilian Andes, to the Strait of Magellan.  
The natives on that coast are often dressed in *Auchenia*  
skins ; Can they be of this animal ?

TRIBE II.—*Cervidae.*

No horns, or deciduous horns ; feet truly bisulcated ;

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structure elegant, slender; mostly with muzzle, suborbital sinus, and with canines in the upper-jaws of the males; succentorial hoofs.

Genus I.—*MOSCHUS*.

Incisors  $\frac{2}{2}$ ; canines  $\frac{1}{0}$  in the males; molars  $\frac{2}{2} = 34$ ; therefore two more than in the females. Incisors and molars as in other ruminants; two or four inguinal mammae; form of the body gathered up; the hind-quarters more elevated than the anterior; slight appearance of callosity on the breast of some; general colouring, gray-brown, with white and black, in streaks about the throat; white in the young of some on the body, and even on adults; no horns.

765. 1. *M. Moschiferus* (the Thibetan Musk.) Size of a roebuck; hair very coarse; brittle, gray-brown; a pouch on the abdomen, before the prepuce of the male containing an odoriferous unctuous substance (the musk); canine teeth long, curved back, edged; very long succentorial hoofs.

Var? Slaty blue, small, often with white on the throat; a blackish streak downwards intervening; also white from albinism.

*Moschi Capreolus*, *Gesn.* Animal *Moschiferum*, *Nieremberg*, *Ray.* *Capra Moschi*, *Aldr.* *Tragus Moschiferus*, *Klein.* *Kabarga*, *Gmel.* *Le Musc*, *Buff.* The Thibetan Musk, *Pent.*, *Shaw.* *M. Moschiferus*, *Auctor.* *Xe of the Chinese.*

Icon. *Buff.*, and in our possession, ditto of variety.

Inhabits China, Tartary, Mountains of Thibet, and Northern India.

766. 2. *Memina* (the Memina.) Size of a rabbit; fur

## SYNOPSIS OF THE

olivaceous ash above, white beneath; sides and back marked with irregular white spots; no musk-bag.

Memina, *Knox, Ceylon*. *Tragulus Memina, Boddasert*.  
Indian Musk, *Pent*. Chevrotain a peau marqué, de taches blanches, *Buff*. Mos Memina, *Auctor*.

Icon. *Buff.*, *Pent*. In our possession from the living specimen.

Inhabits Ceylon.

767. 3. *M. Javanicus*. (the Kantchil.) Size of a rabbit; deep red-brown on back, bay on the sides, white below; three white streaks under throat; canines long, edged, curved back; no musk-bag; very active.

Chevrotain de Java, *Buffon*. Kantchil, *Raffles*.

Icon. —

Inhabits Java in the deep forests.

768. 4. *M. Napu* (the Napu). Size of a hare; ferruginous-gray above; whitish-gray on the sides; five white stripes under throat, divided by black stripes; canines short, straight, obtuse; no musk-bag.

Syn. *M. Javanicus*. Napu, *Raffles, F. Cuvier*.

Icon. *F. Cuvier, Mam. Lithog*. We are tempted to consider a drawing in our possession, from a living specimen smaller than the above, and more active, with streaks less regular, as the true Napu.

Inhabit Java, in the bushes near the sea-shore and human habitations.

769. 5. *M. Pelandoc* (the Pelandok.) Resembling the former, but with a heavier body and larger eyes.

Var.? Gray-yellow; only three streaks on the throat, white? *Lev. Mus*.

Syn. Nupu, *F. Cuv*.

Icon. *F. Cuvier, Mam. Lith.*?

Inhabit Java, in the same places as the former.

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770. 6. \* *M. Pygmeus* (Pigmy Musk.) A very doubtful species, said to be without succentorial hoofs, and to have short canines. The Antilope Pygmea, usually mistaken for it. Left here on the authority of M. Desmarests.

The Pigmy Musk of Sumatra, figured in this Work, may however be considered as a species. It is the size of the Kantchil; ferruginous-gray above; three white stripes beneath the throat; legs buff. The specimen at Exeter 'Change shewed no canines externally protruding, but the muzzle was long and pointed.

*Obs.* All the American species are supposed to be fawns of Deer.

### Genus II.—CERVUS, Lin.

Incisors  $\frac{2}{3}$ ; canines  $\frac{2}{3}$ , or  $\frac{1}{3}$ ; molars  $\frac{2}{3}$  = 32, or 34. The canines in some males compressed and bent back; head long, terminated in most by a muzzle; ears large; pupils elongated; suborbital sinus in most; tongue soft; no gall bladders; four inguinal mammæ. Horns solid, deciduous; existing in the males only, in the females with one exception none, palmated, branched or simple; the horn consisting in a burr, or rose-shaped foot, a beam and branches, or antlers; succentorial hoofs in all.

Sub-genus I.—ALCE. *Horns united into one blade or palm, more or less indented; no muzzle; no canines; tail, very short.*

771. 1. *C. Alces* (the Elk.) Horns spreading into a broad palm, with exterior snags; no separate branches; the snout very tumid, overhanging; ears long; neck short; legs very long; stature considerable; colours dark ashy-brown, sometimes white.

Var. With the basal part of the palm very deeply indented, almost separated, and generally bifurcate. It ap-

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pears also that there is a fossil var. or species not as yet clearly established.

Syn. Alces, *Plin. Aldrov. Gesner. Cervus Alces, Auctor. Elan, Buff., C. and F. Cuv. Orignal, Charlevoix. Moose-Deer, Dudley, &c. Elend and Elch of the Germans. Los of the Slavonic Nations. Bulan of the Tartaric. Elk of the British. Moose of North Americans, and Algonquins. Mongsoo of the Cree Indians. Kistu of the Cluches, and Moluck of the Columbia River Indians.*

Icon. *Fred. Cuvier, Mam. Lithog. Nobis, from the life.*

Inhabits a zone south of the arctic, from the sixty-fifth to the thirty-fifth degrees of north latitude, on both continents.

772. 2. \* *C. Coronatus* (Crowned Elk.) Known only from a pair of horns about one foot long, with seven processes on each; described by Baron Cuvier as belonging to the following; but perhaps an intermediate animal between the two sub-genera. They are in the Paris Museum.

Syn. *C. Coronatus, Geoff. Cerf Couronni, F. Cuvier, Schreb.*

Icon. *Nobis, G. Cuv. Oss. Fossils.*

Inhabits

Sub-genus II—RANGIFER. *Horns in both sexes; palmated or pointed at brow, and bezantlers, and at top; incipient muzzle; canines in both sexes.*

773. 3. *Tarandus* (the Rein-deer.) Horns varying greatly, but in complete adults with a palm on the brow and bezantler; the beam forming a concave bend, terminated with a third palm, or with snags; smaller in the females; the

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muzzle only a naked triangular spot; colours white, with intermixture of brown, or various; tail very short.

Var. It seems that the American varieties have the horns shorter, more robust, straighter; palms narrower, and fewer processes, but occupying more of the horn: 1. Caribou des Bois \*. 2. Great Caribou of the Rocky Mountains. 3. Labrador, or Polar Caribou.

Tarandus, *Pliny*, *Ælian*, *Aldrov.* Rangifer, *Gesner*. Caribou, *Charlevoix*. C. Grœnlandicus, *Briss.* C. Rangifer, *ejusd.* C. Tarandus, *Auctor.* Renne, *Buff. G. and F. Cuv.* Rein-deer, *Pent., Shaw.* C. Mirabilis, C. Palmatus, *Joh. nat.* Rennthies of the Germans. Olen of *Sclavonic.* Juscha, Putsche, *Sægau, &c., of the North East of Asia.* The Attenk of the Cree Indians in the Labrador Caribou.

Icon. *Buff. Schreb. Fred. Cuv. Mam. Lithog.* Siberian American specimens. *Nobis* from Mr. Temminck's Museum and Plymouth.

Inhabit the arctic circle of both continents; in Europe, never south of the Baltic, nor in America, south of the St. Lawrence.

+ *C. Guetardi* (Fossil Rein-deer.) Small, slender, almost filiform fragments of horns; belonging to an animal not larger than a fallow-deer; found near Etampes in France.

\* A specimen, conjectured to be this variety, measured about three feet six inches at the shoulder, six feet six in length; the head one foot eight inches; each horn three feet four inches; the brow palms meeting on the forehead, the second spreading each of five snags, and one foot three, and one foot four inches long; the terminal tip developed; one snag to the rear; all very robust; general colour dark chocolate-brown, whitish intermixed; no naked triangular space between the nostrils; face very flat; ears four inches long; gray outside.

† In the former part of this Synopsis, the fossil non-existing species are not inserted. In this catalogue of Ruminants by Major Hamilton Smith, they are inserted in his respective divisions of the Order, omitting the consecutive numerals.—Ed.

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Syn. Bois de Cerf, trouvés a Etampes. *Guetard Mem. G. Cuv. Oss. Foss.* Cerf d'Etampes, *Cervus Guetardi, Desmarests.*

Sub-genus III.—*DAMA.* *Horns round, with brow and bezantler pointed; summit palmated, lengthways; no canines; a muzzle.*

774. 4. *C. Dama* (the Fallow-deer.) *Horns in the male only, round, with brow and bezantlers pointed; the summit palmed lengthways, indented above and below; colours brown with white spots; tail long, black above, white below; no canines; a muzzle; black streak on buttocks, behind which the rest is white.*

Var. Brown, and in the north, one nearly black.

*Platyceros* and *Dama*, *Pliny.* *Dama Vulgaris, Gesn. Aldrov. Platogna, Belon. Daim, Buffon, G. and F. Cuv. C. Dama, Auctor. Fallow-deer, Pent., Shaw.*

Icon. *Buff. Schreb. F. Cuv. Mam. Lithog.*

Inhabits Europe; Western Asia.

*C. Giganteus* (Fossil *Dama* of Ireland.) *Horns of very large dimensions; broad palm with snags on both borders, fewer than in the Elk, brow and bezantler; first snag of the palm longest; skeleton resembling the Stags, but approaching in size that of the Elk.*

Syn. Irish Elk. Fossil Elk of Ireland, *Molineux, Pent. &c. C. Giganteus, G. Cuv. C. Hibernus, Desmarests; perhaps the Machlis of Pliny. Euryceros of Oppian. Segh of the Britons, and Schelch of the Ancient Germans.*

Icon. Heads in *Phil. Transactions.* Skeleton, *Encyclop. Britain Supl. Idem, Cuv. Oss. Foss.*

Inhabit. Found in the peat bogs of Ireland, in Germany, near Worms on the Rhine, and in England, France, &c. The skeleton in the Isle of Man.

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*C. Paleodama* (Fossil Dama of Scania.) Horns resembling the living Fallow-deer, but with only one antler on the beam, which is much more curved; the palm narrower in proportion; its anterior border without snags, forming a considerable segment of a circle; the extremity to the front, and downwards; length forty-seven inches.

*C. Paleodama*, *Retsius*, *Mem. Acad. Stockholm. G. Cuv. Oss. Foss. Desmarests.*

Inhabit. Found in peat ground near Svedala in Scania, Sweden.

\* *C. Somonensis* (Fossil Dama of Abbeville.) Horns resembling the Fallow-deer, rising from the head, without pedicles, larger, wanting an anterior antler.

Syn. Daim d'une Grande Taille, *Cuv. Cerf d'Abbeville. Cervus Somonensis, Desm.*

Icon. *Cuv. Oss. Foss.*

Inhabit. Found in the sands on the declivities of the Somme, near Abbeville, France, and in Germany.

Sub-genus IV.—ELAPHUS. *Horns round; three antlers turned to the front; summit terminating in a fork or in snags from a common centre; suborbital sinus; canines in the males; a muzzle.*

775. 5. *C. Elaphus* (the Stag.) Horns with three anterior antlers, all curving upwards; the summit forming a crown of snags from a common centre; tail middle-sized; lachrymary sinus; muzzle; canines in the males; colour red-brown in summer, brown-gray in winter; pale disk on buttocks.

Var. Barbary and Corsican Stag. Browner, smaller, lower; horns terminating in forks? This is the Bukr-al

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washi, and the female Fortass, or Broad Scalp, because without horns, of the Moors\*.

*Ελαφος*, *Arist. Ælian.* *Cervus*, *Pliny.* *Cerf*, *Buff.* *G. and F. Cuv.* *C. Elaphus*, *Auctor.* *Stag*, *Pent.*, *Shaw.* *Hirsch of the Germans.* *Olen*, and *Jelen*, *Sclavon.* *Buga of Tartar.*

Icon. *Buff. F. Cuv. Schreb.*

Inhabits Europe, Western Asia, Barbary, Corsica.

776. 6. *C. Canadensis* (the Wapiti.) Horns very large, branching in serpentine curves, terminating in a fork; brow antler over the face; muzzle broad; suborbital opening wide; tail very short; disk on buttocks; summer colours dun-brown; winter, dark brown-gray; stature surpassing the *Elaphus*.

Var. The real *C. Canadensis*, somewhat smaller; antlers more bent up; termination of beam often trifurcate; colours darker.

*C. Canadensis*, *Briss.* *E. Strongyloceros*, *Schreb.* *Stag of America*, *Catesby.* *C. Major*, *Ord.* *Wapiti*, *Barton*, *Michell*, *Leach.* *American Elk*, *Bewick.* *Le Wapiti*, *G. and F. Cuv.* *Elk.* *Round-horned Elk.* Sometimes *Red-deer of the Americans.*

Icon. *Le Sueur. F. Cuv. Bewick. Nobis* mas. et. fem.

Inhabits Canada, Missouri, and Western States.

777. 7. \* *C. Occidentalis.* *Nob.* (North-western Stag.) Horns with three antlers to the front; summit with one, two, and even three successive bifurcations; the forks parallel to the front; the medial or bezantler longest; colours dark; tail five or six inches long, with tuft at the end; ears long; size of the Stag of Europe?

*C. Auritus*, *Warden.* *Mule-deer*, *Le Raye.* Perhaps *Wewaskish*, or *Wa-was-keesho* of *Hearn and the Crees.*

\* Bukr-goat, *Al-washi* of the Forests.

Icon. In our possession.

Inhabits remotest part of North Western America.

778. 8. *C. Wallichii* (Nepaul Stag.) Horns rather short, with two small antlers at base, pointing to the front; half way up the beam a small snag turned forward; large suborbital opening; colours yellowish brown-gray; large disk upon the croup; tail very short.

*C. Wallichii*, *G. Cuv.*

Icon. *F. Cuv. Mam. Lithog.*

Inhabits the Mountains of Nepaul, the only specimen known being brought from thence by Dr. Wallich.

\* *C. Americanus* (Fossil Stag of America.) Fragments and part of a skull of a fossil species, allied to *Canadensis*, found with bones of Mastodon near the Falls of Opio.

*C. Americanus*. Fossil Elk of the United States. *Harlan Fauna Americana*, first noticed by *Dr. Wistar*. *Trans. Amer. Phil. Soc. New Series*, vol. 1.

Habitat. Fossil in North America.

Sub-genus V.—*RUSA*. Horns trifurcate, with basal but no median antler; beam terminating in a perch, with one process or snag on the anterior or posterior side of the beam, and forming a fork; broad muzzle; deep suborbital slit; canines, sometimes even in the females; mane on neck; in most dark colours.

779. 9. *C. Hippelaphus* (the Great *Rusa*.) Horns trifurcated; basal antler on the burr; beam reclining back and outwards, with a medial bifurcation, the branch being on the external anterior side; heavy mane and beard on the neck; large suborbital opening; tail long, terminated by a dark tuft; hair coarse fulvous-brown in summer, gray-brown in winter; no disk; large stature.

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Great Axis of *Pennant*. *L'Hippelaphe*, *G. Cuv.* The Gauchoi are noticed by the Persian physicians as of three varieties, probably these and the two following. Also named Gauzen and Gozen. In Arabic Iyyol or Uyyal. In the Indee, Baresing'ha.

Icon. *F. Cuv. Anim. Lithog.* *Nobis* from specimens in the Paris Museum.

Inhabit Java? Bengal, chiefly the Jungleterry district.

780. 10. *C. Unicolor*, *Nob.* (Gona Rusa.) Horns long, slender; antlers much developed; pedicle at base; rather elevated; basal antler on the burr, curving forward, upward, and inwards; half way up the beam, second antler short, directed inwards; ears broad, pointed; muzzle broad; throat covered with long bristly hair; shoulders higher than croup; tail rather short; colour entirely brown; size large.

We have applied Professor Schreber's distinctive name of *Unicolor* to this species, because his description does not positively determine the animal, and the Gona is entirely of one colour.

Icon. *Daniell's Scenery in Ceylon, &c.*

Inhabits the forests of Ceylon.

781. 11. *C. Aristotelis* (the Saumer, or Black Rusa of Bengal.) Horns short, robust, pointed; vertical antler on the burr; bifurcation by a branch pointing obliquely to the rear, inserted near the summit of the beam; heavy mane on neck and throat; no disk; colours black with dun points to the hair, and dark-brown; stature large.

*C. Aristotelis*, *G. Cuv.* *Elk of the British Indian Sportsmen.* Saumer in Ramghur.

Icon. Original drawing in the possession of M. F. Cuv. and also in our own.

Inhabit Bengal in the Prauss Jungles.

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782. 12. *C. Equinus* (the Malayan Rusa.) Horns robust, pearly; basal antler on the burr; terminal bifurcation from the internal posterior side of the beam; points obtuse; suborbital opening very large, moveable, admitting air; orange-coloured disk on the buttocks; heavy mane; large stature; canines in both sexes.

*C. Equinus*, *G. Cuv.* Rusa, *Sir S. Raffles.* Mejanggan Banjoe. Great Water Stag. Jamboe Stag. Elant of the Dutch.

Icon. *Nobis* from life, Exeter 'Change.

Inhabit Java, Sumatra, and probably other great islands of the Indian Archipelago. India?

783. 13. \* *C. Peronii* (Rusa of Timor.) Horns rather slender, of a pale brown colour; anterior basal antler as before; second antler posterior, more equal in length with the terminal point of the beam; prominent longitudinal elevation of the cranium between the horns; posterior angle of the orbits much raised; canines; snout long and pointed.

*C. Peronii*, *G. Cuvier.*

Icon. *The horn, pl. v. fig. 41. Oss. Foss. vol. iv. G. Cuv.*  
Inhabit Timor.

784. 14. *C.* ?(Rusa of Malacca.) Male unknown; female of the size of the Hind of Europe; of a brownish-black colour, with white border to the inside of the lips and base of the ears; inside of limbs white; legs white; edge of the buttocks ferruginous; a depression above each eye forming a sinus; hair hard and strong.

Female of *C. Hippelaphus*? *G. Cuv.* Female of Rusa. Etam? of *Raffles.*

Icon. *Fred. Cuv. Mam. Lithog.*

Inhabit Malacca.

785. 15. *C. Mariannus* (Rusa of the Mariannas.) Horns

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heavy, robust, ashy-gray ; basal antler nearly vertical, with a small process between it and the beam ; near the summit a second antler, posterior and internal ; the animal less than the Fallow-deer, with longitudinal eminence on the skull, and near the nose two remarkable convexities ; no canines ; colour dark brown.

C. Marianus, *Desmarest, G. Cuvier.*

Icon. *Nobis* from the specimen in the Paris Museum.

Inhabits the Marianna Islands.

Sub-genus VI.—*Axis*. *Horns similar to the former, but more slender ; no canines ; small, or no suborbital opening ; generally spotted with white ; no mane ; tail down to the houghs ; size middling or small.*

786. 16. *C. Axis* (the *Axis*.) Horns round, elongated, rather smooth ; anterior antler near the burr ; summits of beams converging ; second antler medial, on the internal side of the beam turning to the rear ; no canines, or sub-orbital sinus ; colours bright fulvous, spotted with white ; tail long, brown above, the end dark ; spots on ridge generally oval ; spot on forehead dark.

Var. Of Ceylon, browner with small white spots, irregular, none on the forehead ; head more prolonged.

Common Hog-deer, smaller, more irregularly spotted ; low on the legs ; horns slender ; antlers very short, the second near the summit.

*Axis*, *Pliny. Belon. Pen. Buffon. Cervus Axis, Auctor. Axis, G. and F. Cuv. Shaw. Parrah of Indostan*, and perhaps the *Ruru of the Institutes of Menu.*

Icon. *Buff. F. Cuv.* The varieties in our possession.

Inhabits the plains near Surput and the Jungles of Indostan, Ceylon, Java, Sumatra.

787. 17. *C. Porcinus* (the *Brown Porcine Axis*.) Horns

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slender, with the antlers very little developed : the second near the summit ; ears round at tip ; pink coloured inside ; head short and ovine ; gray ; body brown ; legs short ; two feet high at the shoulder ; species rare.

C. Porcinus, *Pen.* ? Porcine-deer. Cerf Cochon, *Buff.*

Icon. Original drawing in the possession of F. Cuvier to whose kindness we owe a copy.

Inhabit India.

788. 18. \* C. *Pumilio*, Nob. (Dwarf Axis.) Fragment of a frontal not above three inches broad across the horns ; pedicles low ; horns whitish, about two inches high ; small basal antler vertical, the beam flat and pointed, without bifurcation. Specimen in Surgeons' College, London.

Icon. *Nobis* from the above specimen.

Inhabit. Probably India.

Sub-genus VII—CAPREOLUS. *Horns somewhat allied to the former ; a small antler to the front high upon the beam ; the superior turned to the rear, forms a fork, somewhat flattened ; no canines, nor lachrymary sinus ; rudiment of tail.*

789. 19. \* C. *Pygargus* (the Ahu, or Tartarian Roe.) Horns in the young male resembling the Common Roe ; in the old about fourteen inches long ; very robust, rugous, pearly, and denticulated ; first antler of the anterior part of the beam, vertical, with processes at base ; the beam spreading outwards ; the summit bilobed ; posterior antler horizontal, pointing to the opposite horn which is also bilobed ; colours brown, and brown-gray ; below yellowish ; large white disk ; only a rudiment of tail ; size equal to a stag.

Ahu, *G. Gmel.* Cervus *Pygargus*, *Pallas* and *Auctor.* Chevreuil de Tartarie, *Cuv.* Tartarian Roe, *Shaw.* Dikaja Kosa of the Russians. Ahu, Saija. Tartar, Persian, and Bucharian.

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Icon. In our possession ; heads in Prague and Frankfort Museum.

Inhabits Mountains of Central Asia, descending in winter into the plains of Tartary, and probably of Northern India.

790. 20. *C. Capreolus* (the Roebuck.) Horns rather small, cylindrical ; a small antler on the middle of the the beam pointing forward, a second high up, turned to the rear, tail very short, colours brown and reddish ; disk on the buttocks ; size below the middle.

Var. A blackish kind.

Caprea, *Pliny*. *Capreolus Dorcas*, *Gesner*. *Cervus Capreolus*, *Auctor*. *Chevreuil*, *Buff. Cuv*. *Roebuck*, *Pent. Shaw*. *Rehe Rehbock of the Germans*. *Kosa Dikaja*, (*i. e.* Goat) *of the Russ* ; more properly *Jerna* or *Jaru*, in *Sclavonic*. *Ibec of the Tartars*.

Icon. *Buff. Fred. Cuv. An. Lithog*.

Inhabits all Europe, and temperate parts of Asia, Scotland, Dorsetshire.

Fragments of jaws of a fossil roe have been found in fresh water calcareous strata at Montabusard, Dep du Loiret in France. The horns approach in character those of the *Marianna Rusa*, but the teeth of the upper Maxilla are different, especially the two anterior molars, which are simple, cutting and divided into three lobes, with only a collar at the base of the second, by which character the fossil species is distinguished from all known deer, and approaches the Musks. See *Oss. Fossils*, vol. iv. p. 105.

Sub-genus VIII.—*MAZAMA*. *Horns tending to flatten, bending into segments of a circle, the concave part to the front ; one anterior internal antler, the others posterior, and mostly vertical ; long tail ; suborbital pore forming a fold of the skin ; muzzle ; no canines.*

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791. 21. *C. Virginianus* (Virginian Deer.) Horns middle-sized, tending to flatten, strongly bent back, and then forwards; a basal antler on the internal side, pointing backwards; several snags on the posterior edge, turned to the rear, and upwards; suborbital sinus making a fold, and small; muzzle; colours fulvous in summer, gray-brown in winter; no disk.

Var. Somewhat smaller; white coloured triangle on the feet; black mark on the lower lip.

Fallow-deer, *Lawson, Catesby*. *Cervus Virginianus, Auctor.* *Virginian Deer, Pent. Shaw.* *Cerf de Viginie, Cerf de la Louisiane, Cuv.*

Icon. *Fred. Cuv. Mam. Lithog. Encyclop. Cerf de la Louisiane. Supl. XIII. fig. 2. Nobis.*

Inhabit North America, from Canada to Mexico.

792. 22. \* *C. Mexicanus* (Mexican Deer.) Horns spreading outwards, curving to the front with extremities towards each other; an antler on the anterior face of the beam, pointing vertically, pointed or bifurcate, strongly denticulated; another at posterior part of the beam, divided into smaller snags; from the second antler the horns flatten into elongated palms, which in old specimens become very broad, with snags thrown off to the rear; the burr is replaced by large pearls, like incipient antlers; the beam tri-lateral; a muzzle; no canines.

*Cervus Mexicanus, Pent. Gmel.* *Quantla Mazame, Hernandez.* *C. Ramosicornis, Blain.*

Icon. *Pent. Buff.? Nobis.* Specimen in British Museum. Inhabit Mexico.

793. 23. \* *C. Clavatus*, *Nob.* Horns deep yellow colour, very robust, pearly, extending horizontally, and then curving forwards and flattening; strong bifurcated vertical antler at base; on superior edge of beam, three bifurcate

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snags, two others to the front at the summit, and one long heavy clavate and flattened branch hanging downwards from the inferior edge.

Icon. *Nobis* from the collection of Mr. Brooks.

Inhabits— ? probably America.

794. 24. *C. Macrotis* (Great-eared Deer.) Horns slightly grooved, and tuberculated at base; small antler on the internal anterior side of the beam; the beam less bent forwards, equally bifurcated at half its length, and each bifurcation again divided near the summit; the anterior snag of the posterior fork the longest; ears very long, (seven inches,) reaching to the forking of the horns; lateral teeth larger than in the Virginian; colour reddish-brown; dull cinereous about nose; tail reddish-cinereous, compressed; almost naked beneath; dark line on the neck near the head.

Great-eared Deer. *Cervus Macrotis*, *Say. Harlan. Major Long's Expedition.* Mule Deer? *Lewis and Clark.*

Icon. —

Habitat the remotest north-western territories of the United States of America.

795. 25. \* *C. Macrourus* (Long-tailed Deer.) Horns short, small, somewhat flattened; colour dark; belly white; tail nearly eighteen inches long, black above, edged with white, and held up erect when running; larger than the Red-deer, (*C. Virginianus* ?)

Long-tailed Deer. *Cervus Macrourus.* Black-tailed Deer, *Warden.* Deer with a large tail, *Lewis and Clark? Le Roye.*

Icon. —

Inhabit about the River Kansas, Central North America.

796. 26. *C. Paludosus* (Guazupuco Deer.) Horns rather

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large, cylindrical, terminated by a fork, with a branch above the burr, pointing forward and upwards, sometimes bifurcate; lachrymary sinus more developed; tail middling; red-bay above in summer, more gray in winter; white below; the hair of the inguinal parts, and under tail, long and white; spot on nose, and between eyes; white round eyes; size of a stag.

Goazoupouco, *D'Azara*. *Cervus Paludosus*, *F. Cuv.*  
*Desmarests*.

Icon. *Nobis* from specimens in London.

Inhabits Paraguay, in swampy places.

797. 27. *C. Campestris* (Guazuti Deer.) Horns middle-sized, rather slender, more or less rugous; beam sub-erect, with anterior antler pointing forward and upwards; behind one or two snags, turning with the point of the beam obliquely forward and inwards; small suborbital sinus; tail middle-sized; colours brown-bay.

Gouazouti, *D'Azara*. *Cervus Campestris*, *F. Cuv.*  
*Desmar.* *Cervus Leucogaster*, *Goldfus*.

Icon. *Nobis* from specimen at Exeter 'Change.

Inhabits the open plains of South America.

798. 28. *C. Nemoralis*, *Nob.* (Cariacou Deer.) Horns about eight inches long; sub-vertical, rugous at base; small anterior antler about the middle of the beam; posterior second antler, forming a fork with the summits of the horn, which flattens and turns inwards and forwards, making a hook; head roundish; black spot on nose, and one on each side of the mouth, and one on the lower-lip, all on a whitish ground; colour of back yellowish-brown-gray; twenty-eight inches high at shoulder, thirty at croup.

Cariacou of *Daubenton*. Squinatou, *Dobbs*, *Pent.?* Cariacou, *Laborde*. Jumping Deer, American Roebuck? Cerf Blanc ou des Paletuveirs of *Cayenne*.

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Icon. *Nobis* from living specimens, Hospital of New York.

Inhabits Central America, round the Gulph of Mexico to Surinam.

Sub-genus IX.—SUBULO. *Horns small, simple, without branches or processes; small lachrymary sinus; muzzle widening to a glandular termination near the nostril.*

799. 29. *C. Rufus* (the Pita Brocket.) Somewhat higher than the Roebuck; head pointed; muzzle small above; small lachrymary sinus; canines in the male; horns about five inches long; colours lively reddish-bay; face and feet red-brown; lips and chin white; tail nearly nine inches long.

*Cervus Rufus.* Couassou, *Fred. Cuv.* Gouazu Pita, *D'Azara.* Biche de Barallou? *Laborde.* Antelope of Honduras? confounded with an Aplocerus.

Icon. *Nobis* from specimen in the Paris Museum.

Inhabit. Gregariously in the forests of Eastern South America, Bay of Honduras and Paraguay.

800. 30. *C. Simplicicornis*, Nob. (the Apara Brocket.) About six inches lower at the shoulder;\* horns more pointed; no canines in the males; dark ring round the orbits, and spots about the corner of upper lip; colour bright fulvous; tail shorter, with longer hair of a red colour; head and neck ashy-brown in the young.

Guazu Apara of *Marcgrave.* Biche des Bois, *Laborde.* Indicated by *Baron Cuvier, Oss. Foss.*

Icon. *Nobis* from the specimens in the Museum of Prince Maximilian of Wied.

Inhabits Brazil.

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801. 31. *C. Nemorivagus* (the Bira Brocket.) About eighteen inches high at the shoulder, robust in structure; head ovine; ears rather round at tip; lachrymary sinus very small; horns reclined, solid, and pointed, two inches long; fur gray-brown above; much white beneath on belly, limbs, legs, and mouth; fore-arm convex.

Gouazoubira, *D'Azara*. *C. Nemorivagus*, *F. Cuv. Desmarests*.

Icon. *Nobis* from the specimen in the Museum of Frankfort.

Inhabits solitarily in the swampy forests, and near the sea of Eastern South America.

Sub-genus X.—*STYLOCERUS*. *Horns small, with only one anterior snag; standing upon elevated pedicles; long canines in most males; deep suborbital sinus; small muzzle.*

802. 32. *C. Muntjak* (the Kijang.) Horns upon pedicles from two and a half to three inches high, covered with the skin, flattened at the summit; the horns three or four inches long, points turned inwards; small antler at base, pointing forward; the pedicles prolonged in the form of ribs down to the nose; a fold of the skin between the ribs; body compact; legs slender; colour gray-brown, paler beneath; breast and inside of limbs white, this colour increasing with age; stature of a roebuck.

Var? A deep chestnut-brown colour, but probably only the sign of nonage.

*Cervus Vaginalis*, *Bodd*. Chevreuil des Indes, *Allam*. Muntjak, or Rib-faced Deer, *Pent*.

Icon. *Dr. Horsfield's* figure. Female, *Nobis* from Mr. Bullock's Museum.

Inhabit Java, Sumatra, Ceylon?

803. 33. *C. Philippinus* (Philippine Muntjak.) Specimen, without horns; pedicles low; ribs extending only

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as far as the eyes; the face plane; forehead archéd, dark-coloured, with a dirty-buff crescent between the eyes; fur brown sepia-gray; somewhat larger and heavier than the preceding.

*Cervus Philippinus*, *Desmarests*.

Icon. *Nobis* from the Paris Museum.

Inhabit the Philippine Islands.

804. 34. *C. Subcornutus* (Blainville's Muntjak.) Horns resembling the Kijang, but smaller, with regular burr, and small process in front; the point of the beam turned back, and not towards the opposite horn; pedicles short, strong, not much prolonged down the face; no canines?

*C. Subcornutus*, *Blainville*.

Icon. —

Inhabit ? Skull in Surgeons' College, London.

805. 35. \* *C. Aureus*, *Nob.* (the Ubi Muntjak.) Male unknown; female the size of Kijang; forehead square; snout tapering; two strong, hard, bristly, and curling spots of hair on the orbits, resembling dark eyebrows; lachrymary opening large; muzzle very small, not black, almost ovine; colour bright fulvous-yellow; ears broad, large, white inside; throat, belly, inside of limbs, and fetlocks, pure white.

Perhaps the *Rusa Ubi* of *Raffles*.

Icon. *Nobis* from specimen in Bullock's Museum.

Inhabit ? perhaps Malacca.

806. 36. \* *C. Moschatus* (Nepaul Muntjak.) Male two feet eleven inches long, two feet high; horns upon elevated pedicles, slender, without branch, pointing backwards, simple; head seven inches long; hair rough, bristly, two inches long, dun-coloured all over the body; tail six inches and three-quarters long, dark.

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*Cervus Moschatus*, *Blainv.?* Musk-deer of Nepaul, *Sir William Ouseley. Orient. Collections.*

Habitat. Nepaul.

TRIBE III.—*Giraffide.*

Frontal processes prolonged in the shape of horns, covered with hairy skin, which is continued from the scalp, and terminated by long hard bristles, in both sexes.

Genus I.—*CAMELOPARDALIS*, Lin.

Incisors  $\frac{2}{2}$ ; canines  $\frac{2}{2}$ ; molars  $\frac{2}{2}$  = 32. Head long tongued with tuberculum on the chaffron; osseous peduncles covered with skin, and hairy, terminated by a tuft of bristles; no muzzle; upper-lip entire; no lachrymary sinus; ears long; tongue rough; eyes large, soft, pupil elongated; neck very long; withers much elevated; back oblique; legs slender; no succentorial hoofs; callosity on the breast; tail to the hough; female four teats.

807. 1. *Camelopardalis Giraffa* (the Giraffa.) In stature the tallest of mammiferous animals; coat of a dirty-white, marked with dark brown, or ferruginous spots or blotches, somewhat tending to symmetrical forms; large and angular in their shapes; short mane on neck and withers, in alternate parts of black and white; tail terminated by a tuft of dark and long hair.

*Camelopardalis*, *Pliny, Oppian.* Heliodorus, *Gesner.* Anabula, Seraph. Alb the Great; Gyraffa, quam Zurnapa, Græci et Latini *Camelopardalus* Nominant, *Bellon. Prosp. Albin.* *Camelopardalus*, *Lin.* Giraffa, *Camelus Indicus, Johnst.* Giraffa *Camelopardalis*, *Briss.* *Camelopardalis Giraffa*, *Auctor.* Giraffe, *Buff.* Giraffa, *Shaw.* Zuraphate, *Arabic.* Seraphah, *Persian.* Jirataka *Lin* Amharic. Zomer, *Hebrew.* Deba, *Chaldaic, Æthiopic.* Nabis, *Pliny.* Naip of the *Hottentots.* Impatoo, *Bushmen.*

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Icon. *Le Valliant*, &c. *Nobis* from male and female in the British Museum.

Inhabit Central Africa, from Caffraria, and the borders of the Gareep, across the deserts to Abyssinia\*.

### TRIBE IV.—*Capridæ*.

Horns persistent, vagingating upon an osseous nucleus, totally or nearly solid; the horny sheath receiving its increase by annual ringlets at the base, which form in most species annuli, wrinkles, or knots; many striated longitudinally; the horns often compressed; angular, or sub-angular; animals in general of a light structure, calculated for springing or for swiftness; ears erect, funnel-shaped; pupils oblong; no canines in the mouth; vertebræ of the tail never descending below the hough; stature very various.

### Genus I.—ANTILOPE.

Incisors  $\frac{1}{2}$ ; canines  $\frac{1}{2}$ ; molars  $\frac{1}{2}$  = 32. Horns common to both sexes, or in the males only; bony core solid, without sinus or pores, round, or compressed, generally standing beneath the frontal crest; variously inflected, mostly distinguished by annuli, with longitudinal striæ between them; sometimes pearly and forked; the chaffron rather straight, with a muzzle, half muzzle, or simple nostrils; lachrymary sinus in most, and in some a suborbital pouch; eyes large, dark; ears in general long, pointed; inguinal pores; a gall-bladder.

Sub-genus I.—DICRANOCERUS. *Horns greatly compressed, rough, pearly, slightly striated, with an anterior*

\* The fossil teeth of a large ruminating animal found in Siberia, indicate a lost genus, probably of this tribe. Mr. Bojanus has described them, and named the genus, *Merycotherium Sibiricum*, in the *Nov. Act. Acad. Cas. Leop. Carol.*, &c. tome xii.

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process, and the point uncinating backwards; dark coloured, placed upon the orbits, at right angles to the plane of the face, impending over the eyes; no suborbital sinus; no inguinal pores; no muzzle; facial line convex; tail very short; hair stiff, coarse, undulating, flattened, enclosing a sort of marrow. Female mammae? horns? structure cervine. Confined to North America.

808. 1. *A. Furcifer* (Prong-horned Antelope.) Mixed resemblance between the Chamois and Roebuck; horns one foot in length, compressed, flat on the inner side, pearly and striated, with a compressed snag to the front; forking with the after part which forms a hook to the rear; eyes large, high in the head; nostrils ovine; colour foxy-dun, with a spot on the summit of the head; throat and disk on the buttocks, white; tail very short; stature about three feet at the shoulder.

*Antilocapra Americana*, Ord. *Cervus Bifurcatus*, *Rafinesque*. *A. Furcifer*, Ham. Smith., *Desmarests*. *Cabree of the Canadians*.

Leon. *Lin. Trans. vol. xiii. Nobis*.

Habitat. The borders of the Missouri, and plains of the North Western States, and along the Columbia.

809. 2. \* *A. Palmata* (Palmated A.) Horns greatly compressed, with anterior and posterior edges, broad, dark, strongly pearly and striated; on the anterior edge near the base, a broad, flat, leaf-like, obtuse, and deflected process, forming a bifurcation with the posterior, which forms a curvilinear hook to the rear, and inwards; head shorter than the preceding; facial line nearly straight; fur softer, partially woolly, hoary without; a little white on the face, and on the croup; stature of a roebuck.

Mazame? *Hernandes*, lib. ix. cap. 14. *Cervus Hamatus*, *Blainv*. *A. Palmata*, Ham. Smith.

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Icon. *Lin. Transactions*, vol. iii. *Nobis*.

Habitat. Baffin's Bay. Stony Mountains near the River Jaune ; may be only a variety of *Furcifer*.

Sub-genus II.—*AIGOCERUS*. *Horns very large, common to both sexes, pointed, simply bent back, annulated, placed above the orbits. Half muzzle; no suborbital sinus; no inguinal pores; tail descending to the houghs; mane reversed; a white mark before the eyes; throat and under-jaw somewhat bearded; mammae two; stature large; shoulders higher than the croup. Reside in Africa.*

810. 3. *A. Leucophæa* (Blue Antelope.) Four feet high at the shoulder; horns slightly compressed, scimitar-shaped, about twenty-eight inches long, closely annulated, with twenty to thirty rings; no striæ; ears long; colour silvery blue-gray; spot before the eyes; belly, and inside of the limbs, white; short white mane turning towards the head; hide black; tail tufted at the end; appearance of beard on the under-jaw.

*A. Leucophæa, Auctor. Blauw-bock, Kolbe. Tzeiran, Buffon, &c.*

Icon. *Buff. Allaman, Nobis*. Specimen in the Paris Museum.

Habitat. South Africa, rare. Last killed near Swellendam, Cape of Good Hope.

811. 4. *A. Equina* (Roan Antelope.) Four feet four inches at the shoulder; horns very robust, about twenty-four inches long, strongly bent back, with seventeen to twenty-seven prominent rings, more remote from the orbits; ears nine inches long; hair coarse, undulating, loose, mixed red and white; beneath the throat longer, whiter; white spot round and before the eye, formed of a pencil of long hairs; neck with short white reversed mane.

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A. Equina. Antilope Ozanne, *Geoff. Cuv.* A. Aurita, *Burchell.*

Icon. *Dict. des Sciences Naturelles. Nobis.* Specimen, Paris and British Museum.

Habitat. South Africa, on the elevated ridge near the sources of the Gareep, &c.

812. 5. \* *A. Grandicornis* (Long-horned Antilope.) Horns three feet and a half long, fifteen inches in circumference at base, curved like a scimitar, compressed, rounded behind, carinated, rough, with oblique wrinkles on the inner surface, furrows on the external.

A. *Grandicornis*, *Herman.* Empalanga? Empabunga? Empalunga? *Purchas. De Bry, Reg. Congo. p. 22.* Koorooko of the *Bornouese?* El Bucher el Achmer of the *Arabs?* *Denham and Clapperton's Travels.*

Icon. If it be Empalanga, see De Bry in prima parte Iconum, *Ind. Orient. pars 11.*

Habitat. Central Africa? Bornou?

813. 6. \* *A. Barbata* (the Takhaitze.) In size equal to the Equina, with a broad dark nose; white streak before the eye; horns scimitar-shaped, more erect and with fewer annuli; a considerable beard on the chin, and long flowing dark-coloured mane on the neck; colours blue-gray or rufous; no tuft to the tail.

Takhaitze of *Somerville* and *Daniell.*

Icon. *Daniell's African Scenery.*

Habitat. The parting ridge of the waters on the south-east coast of Africa.

Sub-genus III.—ORYX. Horns common to both sexes; horizontal, very long, slender, without ridges, pointed, black, with annuli somewhat spirally twisted to half or two-thirds of their length; the animals large, with long ears, small or

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*no suborbital sinus, ovine muzzle, darker coloured streak through the eyes, mane on the neck reversed; tail reaching to the houghs, and terminated by a tuft of long hairs: no tufts on the knees, nor inguinal pores? two mammae. Stature large; general colours of the fur rufous or vinous gray upon a white ground.*

814. 7. *A. Oryx* (the Caffrarian *Oryx*.) Adult male three feet eight or three feet ten inches high, six feet six inches in length; horns three feet long, annulated, with twenty-eight to thirty-three rings, straight or very slightly bent, horizontal, diverging, and sharp at the points; eyes high in the head; black space round the base of the horns, descending in a streak down the forehead; another passing through the eyes, to the corner of the mouth, connected by a third which runs round the head over the nose. The rest of the head and ears white. General colour vinous buff; the breast, belly, and extremities white; a black list from the nape of the neck to the root of the tail; a broad bar of the same across the elbow, passing along the flank, and ending in a wide space on the thigh above the houghs. Black spot upon each leg beneath the joints.

*A. Oryx, Auctor. Passan, Buffon Resc. Sonnini. Ceinsebock of the Dutch Colonists.*

Icon. *Daniell's Sketches. Nobis* male and female.

Habitat. Caffraria.

815. 8. *A. Leucoryx* (the White *Oryx*.) Adult male three feet seven inches high at the shoulder; head rather square, thick; neck short; body bulky; legs slender; horns three feet long, slender, horizontal, bent back, obliquely annulated, tips smooth; black spot at the base of the horns passing down the face, a second through the eyes towards the mouth, widening upon the cheek; a dark band upon the upper arm, passing down the fore-legs; lower part of

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the thigh rufous, darkening into black about the hough, and upon the hind legs; short dark mane, and end of the tuft of the tail black; the rest of the body milk-white.

*Oryx, Oppian. Antholops, Eustathius. Leucoryx, Pent. and others. El Walrush and Bukrus of the Persians. Ghau Bahrein in India. Jachmur and Yazmur of the Arabs.*

Icon. *Pent. Dr. Flemming. Nobis.*

Habitat. Eastern Arabia, the Island and Province of Bahrein Mekran, Desert of Persia.

816. 9 \* *A. Tao*, Nobis. (the Nubian *Oryx*.) May be a variety of the former. Near four feet at the shoulders; seven feet in length; horns three feet four inches long, more robust, very spirally annulated, equally curved backwards; nose blunt; the neck longer, the structure more elegant; hoofs low and flat; colour rufous and white, forming a gray on the nose, temples, cheeks, neck, upper arm, and lower part of the thigh; more white over the shoulders, back, flanks, and croup; a slight blackish mark above and beneath the eye, and a broad white streak passing before it to the corner of the mouth; mane and tuft of tail white.

*Tao of the Hebrews and Egyptians. Dante and Lout of Congo? Leo Afric. de Bry.*

Icon. *Nobis*, from the superb specimen in the Frankfort Mus.

Habitat. Nubia, interior of North Africa.

817. 10. \* *A. Besoastica* (the Algazel.) is perhaps a third variety. Three feet five inches high at the shoulder; five feet two inches long; horns three feet long, round, slender, bent back, with thirty-six annuli not spiral; forehead narrow; head long; neck short; body clumsy; legs slender; lachrymary sinus beneath the eye; reversed ridge of short

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white hair on the neck ; head white ; dark spot at the root of the horns passing down the face, another less distinct through the eyes ; body and neck fulvous-gray.

A. Algasel, *Fred. Cuvier*. A. Besoartria, *Licht. Pallas*.

A. Eleotragus, *Schreber? Lichtenst?*

Icon. *Fred. Cuvier, An. Lithog. Nobis*. Specimen, Paris Mus.

Habitat. interior of Senegal. Seen by Major Denham south of the river Shary ?

Oryges passing into other Sub-genera.

818. 11. *A. Addax*, Nob. (the Addax.) Three feet seven inches high at the shoulders ; three feet eight inches at the croup ; horns robust, black, round, divergent, with two and a half spiral turns, thirty-two to thirty-five annuli ; some dichotomous, extending three-fourths of the length ; two feet four inches long ; no lachrymary sinus ; eyes large, dark ; dark-coloured mane on the neck ; tuft of long dark hair on the throat ; head thick ; forehead flat, covered with dark hairs, and surrounded by a narrow white line passing downwards before the eyes ; nose ovine ; chaffron, cheeks, and neck, liver-coloured gray, diluting on the shoulders, and the rest of the body milk-white ; hoofs flat, broad, round, and black ; tail and tuft white ; female two mammæ ; horns equally large. This species passes from the Orygine Sub-genus to the Damaline sub-genus *Strepsiceros*.

*Strepsiceros* and *Addax* of *Pliny* and *Caius* in *Gesner*. *A. Addax*, *Gratzmer*. El Bucher Abiad, of *Denham* and *Clapperton*.

Icon. *Nobis*. Male and female specimens, Frankfort Museum, head in *Gesner*.

Habitat. Nubia.

819. 12. \* *A. Kemas?* (the Chiru.) Total length, five feet eight inches. About three feet high at the shoulders ;

neck long; croup more elevated than the withers; horns, twenty-one to twenty-six inches long, black, slender, striated, annulated, slightly lyrate, points turned forward and sharp; no lachrymary sinus; nose ovine; ears short; body long; tail eight inches without tuft; hair rough, thick, coarse, concealing a fine downy wool underneath; the face and legs, dark; neck and back, blue-gray slate colour passing to rufous; belly, inside of the limbs, and end of the tail, white. Female characters unknown.

Kemas? *Ælian*. Chiru of *Bhootan*, pretended Unicorn of the Natives.

Icon. The horns? *Nobis*.

Habitat. The Himalaya Mountains.

Subgenus IV.—*GASELLA*. *Horns common to both sexes, placed nearer the orbits, more vertical, bending back, and the points forward, and also turned outwards, and again inwards, constituting a lyrate form: they are black, annulated and striated. These animals have small lachrymary sinus, inguinal pores, ovine nose; mostly tufts on the knees, and dark-coloured bands on the flanks; eyes very large and dark; tail short and tufted; mammæ two or four. Gregarious on open plains.*

820. 13. *A. Pygarga* (the White-faced A.) Adult male three feet eight inches at shoulder; six feet long; horns, twelve to fifteen inches long, seven inches circumference at base, black, very strong, with ten or twelve semi-annuli on their anterior side, and striated between. A patch of rufous hair at base of the horns, divided by a white streak, which passes down the face to the nose; ears long, reddish outside, sides of the head, neck, flanks and croup, deep purple-brown, the back hoary, bluish white, as if glazed; legs white; no tufts on knees. Characters of the female unknown.

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A *Pygarga*, *Auctor*. Nunki of the *Booshwanas*. A. *Dorcas*, *Pallas*. A *Pygarga*, *EjUSD*. A *Pourpree*, *Desmarests*, &c. *Blessbock of the Dutch*.

Icon. *Schreber*.

Habitat. *Caffraria*.

821. 14. *A Mytilopes*, *Nob*. (Broad-hoofed Antelope.) The male unknown; the female two feet eight inches high; four feet two inches long; head nine inches; horns one foot, slender, round, sublyrate, black, with thirteen or fourteen obsolete rings, standing on a broad rufous spot; ears six inches long; no lachrymary sinus perceptible; incipient dark muzzle between the nostrils; space between the eyes, mouth, under-jaw, breast, belly, croup and legs, white; a bar across the nose, neck, shoulders and flanks lower part of buttock fulvous-ochre colour; a space on the withers and back, of a glazed whitish-gray, as in the former; small callosities below the knees, and a dark brown spot at the spurious hoofs; hoofs broad, flat, rounded, black, muscle-shaped; body rather heavy; four mammæ.

A *Naso Maculata*, *Blainv*. A. *Nez-tache*. A. *Mytilopes*, *Nob*. *MS*.

Icon. *Nobis*. Specimen in British Mus.

Habitat. *Western Africa*.

822. 15. *A. Dama* (Swift Antelope.) Adult male three feet high at the shoulder, extremely light and elegant in structure; head broad; nose ovine, small; horns black, one foot long, with twelve to sixteen annuli, lyrate, points turned forward and inwards; small lachrymary sinus; ears six inches long; tail short; knees covered by two rows of bristly hairs, turned flat upon the joint, the points inwards; the head white, with a spot of bright rufous hair at the base of each horn; ears six inches long, outside at the root

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rufous, in the middle white, and tips black; the neck, shoulders, and back, whitish rufous; a spot on the throat, the rest of the body, breast, limbs, and tail, white, with a rufous streak upon each of the fore-shanks. The female nearly equal in size to the male; colours similar.

L. Nanguer, *Buffon*. A. Dama, *Auctor*. Swift Ant. *Pennant*, is the young animal. A. Ruficollis, *Gratzmer*, the adult. Engry? of the *Bornouese*. Ngria? of the *By-harmese*.

Icon. The adult, *Nobis* male and female. Le Nanguer, *Buffon*.

Habitat. The interior of North Africa from Nubia to Senegal.

823. 16. *A. Euchore* (Springer Antelope.) The adult male about twenty-two inches high at the shoulders, twenty-four inches at the croup; head resembling a lamb's; horns brown-black, lyrate, robust, with about twenty complete rings, tips turned inwards or forwards; general colour of the fur pale-dun, with white about the head, limbs, belly, and croup, separated from the dun by a broad band along the flanks, another on the edges of the fold of the croup, and a dark streak through the eye; females similar to the males; horns more slender, with few distant annuli.

*A. Euchore*, *Forst. et Auctor*. Proukbock, *Vosmaer*. Springbock of the *Dutch*. *A. Marsupialis*, *Zieumer*. *A. Pygarga*, *Blumenb.* *A. Dorsata*, *Lacepède*. Tesbe of the *Caffres*.

Icon. *Sparraman*. *Nobis* male and female.

Habitat. Plains of South Africa.

824. 17. *A. Subgutturosa* (Persian Antelope.) Adult male about twenty-four inches high, by three feet six inches from nose to tail; horns large, grayish-black, lyrate, annulated; fur ashy-brown above, white beneath, with a

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brown band on the flanks; the larynx tumescent; females smaller; no brushes on the knees.

*A. Subgutturosa*, *Guldenst. et Auctor.* *Ahu of Kæmpfer.*  
*Tzeiran of the Persians.* *Jairou of the Turks.*

Icon. *Schreber.* *Guldenstädt.* *Nobis.*

Habitat. *Persia, Syria, Bucharìa.*

825. 18. *A. Dorcas* (the Barbary Antelope.) Adult male less than the Roebuck; horns black, round, lyrated, thirteen inches long, annulated at base, semi-annulated in the middle, with twelve or thirteen bars, points slightly turned forwards, and the sides striated; facial line concave; face rufous, with black in the middle, and edged at the side with yellowish-white, which extends from the orbits to the nostrils; a white and black streak from the eyes to the nose inside; ears streaked with black; eyes large and black; general colour pale fulvous; below white; tail short, tufted with black; brushes on the knees; a broad brown band on the flanks; female with horns more slender, points turned inwards; two mammæ.

*Dorcas, Ælian.* *A. Dorcas, Pallas et Auctor.* *Gazal of the Arabs.* *Tzebi of Scripture.* *Gazalle, Buffon.*

Icon. *Buff. Schreb. F. Cuvier.* *Nobis* male, female, and young.

Habitat. *Northern Africa, Southern Syria, and Persia.*

Var? *A. Kevelia* (the Kevel.) Adult male equal in size to the former; facial line straighter; horns more robust, compressed at base, longer, with more decided flexures, with twelve to twenty annuli, points turned forwards; orbits larger; eyes fuller, hazle colour; white space round the eyes, broader, and the same colour extending on the nether jaw; streak down the face fulvous; below each eye fulvous-brown, without blackish intermixture; general colour pale-fulvous, beneath white, and on the buttocks

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separated by a feint streak of brown ; the brown band on the flanks sometimes obliterated ; tufts on knees ; female resembling the former, and in a younger state, often mistaken for the Corinna.

A. Kevela, *Auctor.* Le Kevel, *Buffon.*

Icon. *Buffon.* *Nobis* male, female, and young.

Habitat. South-western Morocco, North Africa, between the Chain of Atlas and the Sahara.

Var? *A. Corinna* (the Corinna.) Adult male somewhat less than the Kevel ; horns black, more depressed at base, recumbent, and simply lyrate, slightly turmescent, about seven inches long, closely wrinkled beneath with obsolete small bars in the middle ; nose and mouth white ; chaffron and streak before the eyes bright fulvous ; forehead and general colour pale-fawn colour, mixed with gray on the flanks, beneath white ; a light chestnut band on the flanks ; small dark tufts on the knees.

*A. Corinna*, *Auctor.* Corine? *Buff.* Korin of the *Negroes.*

Icon. *Nobis.*

Habitat. Central Africa.

Var? *A. Cora*, \* *Nob.* (the Cora.) The male twenty inches high at the shoulder ; three feet two inches from nose to tail ; head round, with tapering small mouth, seven inches and a half long ; from nose to horns five inches ; the horns placed midway between the orbits, subvertical, about five inches long, round, slender, points turned backwards, smooth, without striæ, but one or two circular groves ; no perceptible suborbital sinus ; a black streak from near the base of the horns to the nostrils ; a second through the eyes towards the nose ; forehead and chaffron rufous ; occiput dark-brown ; mouth, nose, space between the streaks and region of the orbits white ; cheeks fawn-coloured ; general colour yellowish-rufous, beneath white ;

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dark streak on the flanks; small callosity on the knees; tail five inches, tufted with black; dark-brown tuft of hair on the anterior face of the pasterns to the division of the hoofs; female resembled the male; horns only four inches long.

Icon. *Nobis*.

Habitat. Shores of the Persian Gulf, Eastern Arabia.

Sub-genus V.—ANTILOPE. *Horns common to the males only, never truly lyrated, seated below the frontal crest, often sub-spiral or spiral; suborbital sinus developed; inguinal pores; small bare space for a muzzle; two mammae; knees often tufted. Gregarious, or in families mostly on open plains.*

826. 19. *A. Melampus* (the Pallah.) The adult male above three feet high at the shoulder; nearly five feet in length. High on the legs; the horns black, about twenty inches, ascending obliquely upwards and outwards, and midway at an obtuse angle, obliquely inwards, rough and coarsely annulated at base, smooth at tip; ears seven inches long; general colour fulvous; brown on the back; beneath and legs white, with a black spot round the spurious hoofs, and a dark streak sometimes double on the buttocks; tail white, eight inches long, without a tuft; no brushes on the knees.

*A. Melampus*, *Lichtenstein, Desmar. Pallah, Daniell.*

*A. Pallah, Cuv. Pallah of the Booshoanas.*

Icon. *Lichtenstein. Daniell. Nobis.*

Habitat. South Africa.

827. 20. *A. Forfex*, \* Nob. (the Gambian Antelope?) Male about twenty-five inches high at the shoulders, rather bulky in the carcass; horns a foot long, black, close at base, slightly bent forwards, then opening laterally with their points again turned inwards, annulated with twelve

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rings, the tips smooth; forehead broad; nose tapering with incipient black muzzle; ears large, open, with tufts of long hair hanging out of the conch; lengthened lachrymary opening; general colour fulvous dun; space round the orbits and inferior parts white; tail short, with black tuft; dark streak down the front of the legs, with spot on pastern joints; small dark brushes on knees; female smaller; two mammæ; no tufts on the ears.

Gambian Ant. *Pennant*.

Icon. Head, *Pennant*. Male and female, *Nobis*.

Habitat. Central and west coast of Africa.

828. 21. *A. Adenota*, Nob. (the Kob?) Male about twenty-six inches high at the shoulders; horns at base nearly vertical, spreading outwards, then bending back, tips slightly forward, nine inches and a half long, robust, black, striated, compressed at base, with ten semi-annuli on the anterior side, and the points smooth; head long, pointed, terminated with small black muzzle; general colour fulvous bay; space round orbits, lips, and under parts white; a small glandulous tubercle on the loins, from whence the hairs whirled in a circle over the body; a dark streak on the anterior face of the legs, with a band of the same colour at the fetlocks; a dark brush on the knees; tail short, wholly covered with long black hair; female resembling the male, but without horns.

Le Kob? *Buff*. A. Kob? *Desmarests*. Petite vache brune?

Icon. *Nobis* male and female.

Habitat. Central and Western Africa.

829. 22. *A. Colus* (the Saiga.) Male something less than the Fallow Deer; body bulky; head thick and heavy; horns distant, between spiral and lyrate, about ten inches long, erect, annulated, diaphanous, and yellowish in colour; the nose broad and cartilaginous; colour gray-dun, with

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dark streak on the spine, beneath white; in winter, although hoary, small tufts on knees; the female hornless. In the males there are sometimes three horns.

*Κολος, Strabo. Colus of Gesner and Johnston. A. Saiga, Pallas and Auctor. Sulok and Suhah of the Poles. Margatsch (the male), Saiga (the female), in Russian. Akoin of the Turks.*

Icon. *Pallas. Nobis.*

Habitat. South-eastern Poland, shores of the Danube, Black Sea, to the Ural and Caspian.

830. 23. *A. Gutturosa* (the Dseren.) Adult male about two feet six inches at the shoulder; four feet eight inches in length; head thick, short; horns about nine inches long, annulated to near the tips, reclining backwards, and wavy points turned inwards; colour black or dark yellow; nose blunt, bristly; larynx swelled externally, and surrounded with long bristly hairs; glandulous bag on the abdomen near the prepuce; tufts on knees predominant; colour in summer yellowish-gray above, and white beneath; in winter almost white; female smaller; no protruded larynx or pouch on the belly.

Ant. *Gutturosa, Pallas and Auctor. Le Dseren, F. Cuv. Desmar. Hoang Yang or Yellow Goat of the Chinese.*

Icon. *Pallas. Nobis.*

Habitat. The great desert of Cobi in Central Asia, and Western China.

831. 24. *A. Cervicapra*. (the Common Antelope.) The adult male about two feet six inches at the shoulders, and four feet two from nose to tail; horns black, round, annulated, twelve to twenty-two rings, spiral, or with three flexures, and from twenty to twenty-four inches long; the head long, nose blunt, with incipient muzzle, or naked space between the nostrils; general colour pale fulvous

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above, white beneath, this colour darkening with age to nearly black, having part of the neck and thigh only fulvous; a white streak in younger animals runs along the side, in very old a black streak lower down on the flank; female hornless, paler in colour; tufts on knees.

A. *Cervicapra*, *Auctorum*. Antilope, *Buff.* Antilope, *des Indes Desmar.* Ena of the *Sanscrit.* Sasi or Sasin of the *Modern Hindoos.*

Icon. *Buff.* *Schreber.* *Nobis* in all states.

Habitat. India.

Var? An old male larger in size than the former, more robust in structure; horns eighteen inches long, very stout, spiral, with nine or ten semi-annuli close together at the base, fourteen to fifteen complete rings above, dark-brown tips, short; general colour deep rufous tawny; white spot round the eyes, on the cheek or throat, and beneath white; female nearly the same; a young male pale tawny, with darkish streak; the horns earthy brown.

Icon. *Nobis* male, female, and young.

Habitat. South-western Morocco?

Sub-genus VI.—REDUNCA. *Horns in the males only, placed behind the orbits, black, reclining, tips bending forwards, annulated below, above smooth, short, slender; ears long, open, oval; imperfect suborbital opening; a small muzzle; inguinal pores; no tufts on knees; tail not longer than the buttocks; fur rather long, wavy; structure in general more robust; legs shorter; mammæ four; not gregarious; residing variously. Africa.*

832. 25. A. *Eleotragus* (the Rietbock.) Adult male two feet ten inches high at the shoulder, four feet six or eight inches long; ears six inches; tail nine or ten inches; horns ten or twelve inches long, recumbent below the plane of the face, divergent, regularly curved with the points

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forward, wrinkled at base, and annulated with obsolete rings in the middle; general colour ashy-gray, tinged with ochre, beneath white; hair of the throat long, hanging down, and whitish; female smaller, in other respects resembling the male.

A. Eleotragus, *Schreb. Desmarests, &c.* A. Arundinum, *Bodd.* A. Arundinacea, *Shaw.* Rietbock, *Allam* and the *Dutch.*

Icon. *Allam. Supl. Buff. Nobis* male and female.

Habitat. Caffraria among the reeds of dried river courses.

833. 26. *A. Redunca* (the Nagor.) Adult male two feet eight inches high, four feet eight inches long; head nine inches; horns six inches long, approximating at base, a little compressed, not much divergent, sub-erect, bent forwards, with five obscure semi-annuli separated by striæ in front, points smooth, approximating; middle sized dark muzzle; ears long; head and neck tawny; back fulvous brown, with a cast of purple; the hair long, hard, loose, whirling in various directions; chin and lower parts white; the tail with much long hair, the base dark, the middle fulvous, and tip white; legs strong fulvous; the female marked in a similar manner.

The young entirely pale rufous, is the Nagor of *Buffon.*

*A. Redunca, Pallas* and *Auctor.* *A. Reversa, Pallas.* Le Nagor, *Buff.* *A. Fulvo Rufula, Afzel. Goldfus.* is the adult. *A. Lalandiana, Desmarests,* the female.

Icon. *Nagor. Buff.* The adult, *Daniell's Sketches of Africa. Nobis* male and female.

Habitat. Western Africa, Caffraria, lives among rocks.

834. 27. \* *A. Isabellina* (Cream-coloured Antelope.) The male two feet six inches at the shoulders, four feet ten inches long; head ten inches; horns eleven inches, robust at base, approximating, parallel along the plane of the face,

the points turned forwards, round, shining, obliquely annulated, six or seven in front, eight or nine in rear, naked, triangular; spot before the eye; hair rather long, standing off, the shorter brown, the longer gray, forming a cream-colour, whirling in several places.

A. *Isabellina*, *Afzelius*.

Icon. —

Habitat. Caffraria.

835. 28. *A. Villosa* (the Riet Rheebock.) Adult male two feet five inches at the shoulder, four feet six inches long; head eight inches; horns eight inches and a half long, straight, vertical, slightly inclining forwards, round, slender, with thirteen rings, sharp pointed; black spot before the eyes; suborbital sinus large beneath; muzzle round the neck, long; body very slender; general colour whitish-gray, with a cast of buff; beneath white; hair very soft and villous; tail five inches, gray, tip with white; female smaller, but similar in colours; four mammæ.

A. *Villosa*, *Burchell*, *MS.* A. *Capreolus*, *Lichtenst.*, &c.

A. *Lanata*, *Dict. d'Hist. Nat.*

Icon. *Nobis* male and female.

Habitat. Deserts of South Africa, monogamous.

836. 29. *A. Scoparia* (the Orebi.) Adult male twenty-two to twenty-four inches high, four feet long; head eight inches; horns nearly vertical, slightly bent forwards, five inches long, with six or seven wrinkles at base, and five annuli above them, round black points, smooth; lachrymary sinus well defined; small muzzle; tufts on the knees; general colour of the face and back tawny, or pale fulvous; a whitish arch over the eyes; under parts white; the throat and breast with loose white hairs; tail short, blackish; the hide sometimes black; female the same, with brushes on knees; no horns.

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A. Scoparia, Schreb. et Auctor. Ourebi, Pent. Suppl.  
Buff.

Icon. Buff. Schreb. Nobis.

Habitat. The plains of Caffraria.

Sub-genus VII.—TRAGULUS. *Horns in the males only, placed near or upon the orbits, shorter than the ears, black, round, vertical, distant, parallel, straight, inclining slightly forward or backward, mostly without annuli or wrinkles, and without striæ; the ears long; the body in general slender; high on the legs; delicate; head round; black space before and about the eyes; a suborbital sinus; small black muzzle; tail very short; inguinal pores; two mammae; no brushes; all monogamous or solitary in various situations. Africa.*

837. 30. *A. Oreotragus* (the Klipspringer.) Adult male twenty-one to twenty-two inches high, three feet seven inches long; forms robust; head short, round, and broad; horns about five inches long, distant, round, vertical, slightly inclined forwards, obscurely wrinkled at base, and annulated in the middle, tips smooth and pointed; legs robust; pasterns rigid; fur standing off, spirally-twisted, hard, ashy at base, brown in the middle, yellow at the tips, forming an agreeable olive.

*A. Oreotragus*, Gmel. and Auctor. *A. Saltatrix*, Bodd. Sauteur des Rochers, Vosmaer, &c.

Icon. Goldfus. Nobis male and female.

Habitat. The rocks and precipices of Caffraria.

838. 31. *A. Rupestris* (the Steenbock.) Adult male twenty inches at the shoulder, twenty-two at the croup, three feet six inches long; head oval; snout pointed; muzzle black, ending in a point upon the ridge of the nose; horns vertical, straight, parallel, round, slender, and pointed, one or two rudiments of wrinkles at base, not quite four

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inches long; ears longer, open, pointed; general colour chocolate-rufous, below white; groin naked and black; tail not protruding beyond the hairs; pasterns short.

A. *Tragulus Rupestris*, Forst. *Lichten*. *Tragulus*, Desmar. A. *Dama*, Cuv. A. *Ibex*, Afzel. Steenbock of the *Dutch Colonists*.

Icon. *Nobis*.

Habitat. The bushes of high mountains in Caffraria.

839. 32. \* *A. Rufescens* (the Vlackte Steenbock.) Male very high on the legs, two feet six inches from nose to tail; horns reclining slightly with the points turned upwards, round, smooth, without wrinkles or annuli, parallel, three inches and a half long, one inch and a half asunder at base, two inches from tip to tip; ears four inches and a half long; head squarer than the former, small black muzzle; general colour bright fulvous red, with a cast of crimson, beneath white; tail very short.

A. *Rufescens*, Burchell, MS. Vlackte Steenbock of the *Dutch*.

Icon. *Nobis* male and female.

Habitat. The open plains of Caffraria, very rare.

840. 33. \* *A. Grisea* (the Grysbock.) Adult male nineteen and twenty inches high, three feet long; head oval, six inches long; horns four inches, smooth, round, vertical, slender, inclining forward, one inch and a quarter asunder at base, three inches from tip to tip; muzzle small and black; ears four inches and a quarter long, broad, open; colour deep chestnut-red, intermixed with numerous single white hairs; beneath rufous.

A. *Grisea*, Cuv. A. *Melanotis*, *Lichtenstein*. Grysbock of the *Dutch*.

Icon. *Nobis* male and female.

Habitat. Shrubby mountainous regions of Caffraria.

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841. 34. *A. Palida* (the Bleekbock.) Adult male twenty-two to twenty-four inches high, three feet five inches long, very slender and light of form; head square; nose pointed; horns perfectly straight, inclining backwards, round, with an obsolete ridge in front, about four inches long, very pointed; black naked ring round the eyes; ears broader and shorter than the former; the tail near three inches long; general colour pale rufous fawn-colour above, and white beneath; females redder in colour; two mammæ.

*A. Palida*, *Lichtenstein*. *A. Diotragus*, *Afzelius*.

Icon. *Nobis* male and female.

Habitat. The plains of Caffraria, rare.

Sub-genus VIII.—*RAPHICERUS*. *Animals of diminutive stature; forehead narrow; horns without wrinkles, annuli, or striæ, black, slender, round, very sharp, subvertical, only known from the skulls. Asia.*

842. 35. \* *A. Acuticornis* (Sharp-horned Antelope.) Horns three inches long, round, smooth, black, and pointed, about three-eighths of an inch in diameter at base, slightly bent outwards and slightly forwards, the frontal crest passing behind them, uniting with a broad parietal bone, terminated by a square ridge.

*A. Acuticornis?* *Blainville*.

Icon. *Blainville?* *Nobis* from the Royal College of Surgeons, London.

Habitat. The East Indies.

843. 36. *A. Subulata*, *Nob.* (Awl-horned Antelope.) Horns three-eighths of an inch in diameter, subvertical, round, smooth, four inches and a half long, bending outwards in the middle, the points slightly inwards, one inch two lines asunder at base, two inches in the middle, higher

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on the frontals than the preceding, the sinciput broader, the parietal narrow.

Icon. *Nobis* from the Royal College of Surgeons, London.

Habitat. The East Indies.

Sub-genus IX.—TETRACERUS. *Horns in the males only to the number of four, the upper or true horns rising on the frontal crest, straight, parallel, distant, without, or nearly without wrinkles, round, smooth, black, and pointed; the spurious or lower placed nearly between the orbits, conical, short, smooth, or slightly wrinkled at base; large suborbital sinus; tail short; monogamous. India.*

844. 37. *A. Chickara* (the Chickara.) Adult male twenty inches and a half high, two feet nine inches long; head seven inches and a half; superior horns, black, subulate, round, without rings, smooth, erect, three inches long; spurious horns one inch four-tenths long, placed between, but rather above the middle line of the orbits, erect, stumpy, smooth; cylindrical three-fourths of an inch long; ears ovate, four inches three-fourths long; tail five inches; general colour bright-bay, beneath whitish; female paler; mammæ?

*A. Chickara*, *Hardwick*.

Icon. *Hardwick*, of male and female, *Trans. Lin. Soc.*

Habitat. Central India.

845. 38. \* *A. Quadricornis* (Four-horned Antelope.) Skull seven inches long; superior horns longitudinally striated, transversely striolated, with rings at their bases; the spurious horns placed before the middle line of the orbits, sub-triangular, yellowish on their inner surface, black on the outer: robust, vertical, one and two-thirds of an inch long, with three wrinkles at base; the general colour of the fur brownish, grayish beneath?

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**A. Quadricornis**, *Blainville*. *Tetracerus Quadricornis*,  
*Leach*. *Le Chikara*? *Duvaucel*. *Fred. Cuvier*.

*Icon. Fred. Cuvier*? *Nobis*?

*Habitat*. Eastern side of the Burampootra, India, Ne-  
paul?

**Sub-genus X.—CERPHALOPHUS.** *Horns in the male only, small, straight, or nearly straight, reclining, placed high on the forehead, black, with wrinkles or annuli; muzzle rather developed, black; hair of the forehead lengthened into more or less of tuft or spread; a pouch opening between the orbits and nostrils, by a puncture or a slit, independent of the lachrymary sinus, which in some is wanting; without tufts on knees, one only excepted; pasterns short; hinder shanks long; mammæ two or four; tail short, tufted; colours generally dark; stature middling or small; reside in covers or bushy plains. Solitary.*

846. 39. **A. Silvicultrix** (the Bush Antelope.) Adult male three feet, and three feet two inches high, five feet long; head ten inches; horns reclining, four inches long, straight, pointed, wrinkled at base, rugous higher up, smooth at tip, and slightly bent outwards; tail pendulous, with a brush; mammæ two; tuft between horns clear brown; general colour dark-brown above, with fawn-coloured longer hair over the spine and loins, grayish beneath; legs dark-chestnut; no tufts on knees.

**A. Silvicultrix**, *Afzel*. Bush Goat of *Sierra Leone*. *Ant. des Buissons*, *Desmar*.

*Icon. Nobis*. Mr. Landseer from living specimen, Exeter 'Change.

*Habitat*. The plains and bushes about the Pongas and Quia in Western Africa.

Var? **A. Platous**, *Nob*. (Broad-eared Antelope.) *Speci-*

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men about equal in bulk to the former, but probably lower on the legs ; head long and pointed ; horns not five inches long, reclining, straight, divergent, irregularly annulated or rugous, pointed, and black ; ears very wide, pointed, longer than the horns, whitish within, dun-coloured at the back ; eyes large ; a black spot on the cheek, marking the opening of the sinus ; dark sepia streak on the chaffron, spreading in a coarser tuft about the horns ; general colour brown, and fawn-colour above, whitish-gray beneath ; no tufts on knees.

A. Platous, *Nobis MS.*

Icon. *Nobis.*

Habitat. The mountains on the west side of Caffraria.

847. 40. *A. Quadriscopa*, Nob. (Four-tufted Antelope.)

Adult male about the size of a roebuck, lower on the legs ; head round ; nose tapering ; horns four inches long, reclining, straight, divergent, sharp at tip, with six or seven small annuli at base ; ears wide, longer than horns, two black striæ inside ; neck long ; darkish streak down the chaffron ; small lachrymary opening beneath the eye, and a naked line from thence towards the nose, indicating a second pouch on the cheek ; forehead covered with longish hair of a dark colour ; general colour brownish-yellow gray, beneath white, a feint lateral streak and several dark cross marks upon the arm ; legs slender, with tufts on the knees, and tufts on the upper anterior end of the posterior shanks ; pasterns short.

*A. Quadriscopa*, *Nobis MS.*

Icon. *Nobis.*

Habitat. West coast of Africa.

848. 41. \* *A. Burchellii*, Nob. (Burchell's Antelope.)

Adult male three feet five inches long, and about twenty-two inches in height ; head seven inches long ; ears six

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inches; the horns five inches, slightly elevated above the plane of the face, approximated, parallel, the superior third part alone bent slightly outwards, and the points inwards and forwards; they are black, round, obtuse at the point, six to seven wrinkles at base, then striated, and above this again irregularly wrinkled, striated, and annulated; no external opening of the lachrymary sinus visible, and sub-orbital pouch not very evident; ears wide, long, and open, marked with three striæ; a space of long bright fulvous hairs upon the forehead; chaffron black; general colour brownish, rusty above, ashy beneath; the limbs robust, and fetlocks short and dark-coloured. It is possible that this is an old *A. Mergens* with the horns diseased, because the two are not exactly alike.

*A. Burchelli*, *Nobis MS.*

Icon. *Nobis.*

Habitat. Caffraria.

849. 42. *A. Mergens* (the Duiker Bock.) Adult male three feet two or six inches in length, twenty-one and twenty-three inches high; horns four inches long, more distant at base than in the former, more reclining, bending outwards, with a longitudinal ridge on the front, traversing four or five annuli of the middle, but not through the wrinkles at the base; forehead covered with a patch of bright fulvous coarse hair; ears five inches long, three dark striæ within; dark streak on the chaffron, and down the front of the legs; a suborbital slit on the side of the face; general colour light brown above, and white beneath; tail short, black, tip with white.

*A Mergens*, *Blainv. Cap. Merga, Forster.* Duiker Bock of the Dutch Colonists. *A. Mergens, Desmar.*

Icon. *Nobis* male and female.

Habitat Southern and Western Africa, but principally Caffraria.

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850. 43. \**A. Ptoox* (the Dodger Antelope.) Male about twenty inches high, and three feet long. More delicately framed than the former; horns three inches long, with three annuli at base, round, bent outwards, reclined, without anterior ridge; a small pencil of vertical black hairs standing between the horns; rufous face and forehead; orbits prominent; lachrymary sinus a little prolonged; and further towards the nose a puncture, seeming to open in a second pouch; nose almost ovine; general colour pale dun above, beneath white; a black streak down the fore shanks, and a spot on the hinder pasterns; tail short, dun, and tipped with black. This may be a variety of the former in a junior state.

*A. Grimmia*, Pallas. *A. Ptoox*, Lichtenstein. Grimea *A. Pent*. The Grimm of Leverian Museum in Shaw.

Habitat. Southern and Western Africa, chiefly Guinea.

851. 44. *A. Grimmia* (the Grimm.) Adult male seventeen and eighteen inches high, twenty-seven inches long; structure very compact, more clumsily built than the former, head thick, terminated by a muzzle; horns very short, stout, reclining, almost concealed in the long dark hair of the forehead, which forms a kind of point between them; face dark; ears short and broad; a lengthened suborbital slit, containing an unctuous substance beneath the eye, but no lachrymary sinus; general colour fulvous fawn, with a dark ashy streak down the back; the inferior parts whitish, the legs dark, and tail longer than the preceding. Females darker.

*A. Grimmia*, F. Cuvier. *Capra Silvestris Africana*, Grim. Icon. F. Cuvier, Mam. Lithog. Nobis male and female. Habitat. Guinea and Western Africa.

852. \* 45. *A. Maxwellii*, Nob. (Maxwell's Ant.) Adult

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female about sixteen inches high, more slender in form than the last; ears longer; forehead square; nose more prolonged and pointed; a round muzzle; black spot beneath the eye, and on the cheek a puncture opening into the lower pouch; forehead and nose dark, a streak above the eyes resembling eyebrows; neck, back, and croup, dark-brown dun; beneath white; mammæ four yellowish, forming an udder; tail two inches long, black.

A. Maxwellii, *Nobis MS.*

Icon. *Nobis.*

Habitat. Sierra Leone.

853. 46. *A. Cærula*, Nob. (Slate-coloured Ant.) Adult male about thirteen inches at the shoulder, twenty-eight inches from nose to tail; head rather long, pointed, with small muzzle; no lachrymary opening, but suborbital pouch lower down, marked by a lengthened streak; horns one inch and a quarter long, recumbent tips turned upwards, black, pointed, with five semi-annuli; nearly concealed in the hair of the forehead; ears short, round, open; general colour slaty purplish-blue, beneath white; pasterns short, and legs buff; hoofs horn colour.

Blauwbockje, *of the Dutch Colonists.* *A. Cærula*, *Nobis MS.*

Icon. *Daniell's Scenery of Southern Africa.* *Nobis* male and female.

Habitat. Caffraria.

854. 47. \* *A. Perpusilla*, Nob. (the Kleenebock.) Male about twenty-six inches long, twelve inches high; head shorter; forehead more elevated than the preceding; a suborbital sack as before; no lachrymary sinus; ears short and round; horns black, conical, slender, reclined, slightly turned inwards, nearly two inches long; incisor

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teeth broader ; pasterns longer ; hoofs smaller ; general colour dull brownish-buff ; beneath white ; perhaps only a variety of the former.

A. Cærula, *Nob. MS.* A Pigmæa, *Desmarets.* Kleenebock of the Dutch Colonists, and Noumetje of the Hottentots.

Icon. *Nobis.*

Habitat. Caffraria.

855. 48. \* A. *Philantomba*, *Nob.* (the *Philantomba.*)

Young specimen eighteen inches long ; horns very short, half an inch, the points just emerging from the long hair of the forehead ; ears rounded at tip ; long slit on the side of the nose ; general colour dark-brown gray ; legs dark ; pasterns short.

May be the Guevei Kaior of the Negroes.

Icon. *Nobis.*

Habitat. Sierra Leone.

Sub-genus XI.—NEOTRAGUS. *Horns in the males only, horizontal, very small, with a few annuli or semi-annuli, black, pointed ; no suborbital slit ; head round ; nose pointed, with a small muzzle ; tail short ; females two mammae ; size very diminutive.*

856. 49. A. *Pygmea* (the Guevei.) Adult male about eleven inches high at the shoulders ; nearly twenty inches in length ; horns one inch and a quarter long, high on the head, rather close, bulky at base, with one or two prominent annuli, points sharp and black ; a small lachrymary opening, but no slit ; ears short, round ; general colour bright bay, beneath whitish ; female duller in colours ; smaller.

Royal Antelope, *Pent.* King of the Harts, *Bosman.* A. *Pygmea*, *Shaw.* *Cervula Parvula Africana*, *Seba.* *Chevrotaïn de Guinée*, *Buff.*

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· Icon. *Shaw. Nobis* from specimens in Leverian and Bullock's Museums.

Habitat. Guinea, Central Africa.

857. 50. \* *A. Madoka*, Nob. (Salt's Antelope.) Animal very small; horns one inch and a quarter long, very slender, recumbent, points slightly turned forward, six or seven semi-annuli at base; ears broad, oval; hair of the forehead very close, short, and fine; no lachrymary sinus; colour of the head pale fulvous; pasterns long; hoofs very long, pointed, horn colour.

*A. Madoka, Nobis MS. A. Saltiana, Blainv. Desmar. Madoka, in Abyssinia.*

Icon, *Nobis* and *Blainville* of the fragments in the Royal College of Surgeons.

Habitat. Abyssinia.

Sub-genus XII.—TRAGELAPHUS. *Horns in the males only? with ridges forming angles, which turn somewhat spirally, seated high on the frontals, reclining; small or naked spot for a muzzle; no lachrymary opening; colours remarkably diversified with white spots and streaks; form elegant, though receding from the typical structure of true Antelopes, and assuming that of goats; females with four mammae.*

858. 51. *A. Sylvatica*. (The Boschbock.) The adult male about two feet eight inches high, and five feet three inches in length; head seven inches; horns ten inches long, marked with an obsolete ridge in front, and one in rear, horizontal, spiral and sub-lyrate, black, and closely annulated at base; general colour brilliant chestnut brown above, and marked with a narrow streak along the spine; several round spots on the cheek; shoulder, loins, and

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thigh, of a pure white, as also the whole of the lower parts; tail six inches long.

Boschbock, *Sparr.* and *the Dutch Colonists.* A. *Sylvatica*, *Auctor.* Bosbock, *Allaman in Buff.*

Icon. *Buff. Daniell Sket. Scen. of S. Africa. Nobis.*

Habitat. The forests of Caffraria.

859. 52. A. *Scripta.* (Harnessed Antelope.) Adult male two feet eight inches high, four feet eight inches long; horns seven inches long, reclining, straight, wavy, with two ridges twisting spirally round the axis; general colour bright fulvous bay, two narrow lines passing from the withers obliquely downwards, one to the flank, the other to the groin, intersected at right angles across the back by three others, and four or five similar across the croup; several round spots about the face and thighs all pure white.

Le Guib, *Buff. Adanson?* A. *Scripta*, *Pall.* and *Auctor*, Harnessed A., *Pent. Shaw.*

Icon. *Buffon.* *Nobis* male and female.

Habitat. Central and Western Africa about Senegal; doubtful in Caffraria.

860. 53. \* A. *Phalerata*, *Nob.* (Ribbed Antelope.) Male about two feet four inches high, four feet long; horns three or four inches long, reclining, conical, not compressed, without ridges or transverse protuberances; forehead broad; a small black muzzle; general colour rufous; a black line edged on each side by one of white, along the spine to the tail; a second white line from the middle of the shoulder to the groin, between them nine perpendicular lines forming ribs, but not intersecting the inferior; on the thigh many, and on the cheeks and face several, round spots all of white.

A. *Phalerata*, *Nob. MS.* Le Guib, var *Desmar. in note.*

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Icon. *Nobis* male, female, and young.

Habitat. Western Africa, about the river Congo; is found in the bushy plains.

Sub-genus XIII.—*NEMORHEDUS*. *Structure assuming a caprine form; skull solid, heavy; horns in the males only? short, round, bent back, annulated at base; a small muzzle; a pouch upon the intermaxillary bone of some; hair coarse, loose, dark; legs robust. Reside in mountainous and woody regions of Asia and Indian Archipelago.*

861. 54. *A. Sumatrensis* (the Cambing Ootan.) Adult male two feet four inches high, four feet six inches long; muzzle broad and black; suborbital sinus opening at a naked space, with a round puncture; horns six inches long, round, reclining, bent back, with ten or twelve wrinkles at base; tail short; general colour black; neck covered with long white hairs; under jaw and gullet white; hair coarse; forms robust.

Cambing Ootan, *Marsden Sum.* *A. Interscapularis, Licht. A. Sumatrensis, Auctor.* Cambtan, *F. Cuv. Desmar.*

Icon. *Marsden Sumatra. Fred. Cuv. Nobis.*

Habitat. Mountain forests of Sumatra. Malayan Peninsula?

Var? *A. Duvaucelii* (Duvaucel's Antelope) described from a drawing sent by Mr. Duvaucel from India. Muzzle smaller, horns more reclined, with fewer annuli; colour ashy gray; mane on neck, standing up, and shorter; lips, chin, and throat, white.

862. 55. *A. Goral* (the Goral.) Male two feet high, three feet one inch long; horns four inches and a half long, black, subulate, bent back, smooth, with five or six annuli at base; eyes large, dark; body round; general

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colour gray-brownish beneath, and whitish under the throat; tail short; female with tubercles covered with a tuft of dark hair instead of horns.

A. Goral, *Hardwick, Lin. Trans.* Bouquetain de Nepal. *Duvaucel, MS.*

Icon. *Lin. Transactions. Nobis.*

Habitat. Mountains of Nepaul.

Sub-genus XIV.—RUPICAPRA. *Structure caprine; horns in both sexes, vertical, round, striated, with few wrinkles at base, taper, suddenly uncinated backwards; limbs strong; inguinal pores; two mammae; two glandular apertures behind the horns; dark streak through the eyes; hair longer, with a small quantity of wool beneath; stature middle sized. Reside in the mountains of Europe and Asia.*

863. 56. *A. Rupicapra* (the Chamois.) Adult male about two feet three inches high, four feet six inches long; horns seven or eight inches long, uncinated backwards and pointed; in old males wrinkled at base, longitudinally striated; cheeks and throat, fawn colour; a black streak through the eyes; general colour brownish gray; wool beneath grayish; tail short.

*Rupicapra, Pliny. A. Rupicapra Pall. and Auctor. Capra Rupicapra, Linn. Chamois, Yzard, of the French. Gemsebock of the Germans.*

Icon. *Buff. Schreber. Nobis* in all its states.

Habitat. The secondary ridges of the Alpine Mountains of Europe and Asia.

Var.  $\alpha$ . The Yzard. Smaller, gray-brown, cheeks and buttocks fawn colour. Inhabits the Pyrenees.

Var.  $\beta$ . The Persian Chamois, smaller; horns bent back into a regular hook from their root; streak through the eyes, nearly obliterated; hair close and fine; colour rufous yellow.

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Sub-genus XV.—*APLOCERUS*. *Structure approaching ovine forms; horns resembling Næmorhædine group, simple, sub-recumbent, conical, obscurely annulated, the points smooth, bent back; no lachrymary opening; no muzzle; tail short. Reside in the mountains of America.*

864. 57. *A. Lanigera*, Nob. (Woolbearing Antelope.) Adult male equal in size to a large sheep; nose ovine; chaffron nearly straight; horns about five inches long, sub-reclined, conical, with two or three obscure annuli; eyelashes white; tail short; structure exceedingly robust; fur, long, fine, abundant, concealing beneath a very fine wool; colours entirely white; hoofs black.

*Rupicapra Americana*, *Blainv.* *Ovis Montana*, *Ord.*  
*A. Americana*, *Desmar.* *A. Lanigera*, *Ham. Smith, Lin. Trans.* *Mazama Sericea*, *Raffinesque.* *Mazama Dorsata*, *Raffinesque?*

Icon. *Nobis. Lin. Trans.*

Habitat. Mountains in the north-west of America.

865. 58. \* *A. Mazama*, Nob. (Ovine Antelope.) A doubtful species which may be a variety of climate of the above. Structure resembling the former, smaller, less robust; horns similar; tail thick and short; fur close and fine, pale rufous-brown.

*Mazame*, *Seba?* *A. Mazama*, *Hamilton Smith, Lin. Trans.*

Icon. *Seba? Nobis.*

Habitat. Rocky forests and mountains of tropical America.

866. 59. \* *A. Temmamazama* (the Chichiltic.) Likewise a doubtful species; size of a kid; horns five inches and a half long, black, wrinkled, slender, bent back at a slight angle; general colour, pale chestnut-brown, with

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some white beneath ; tail carried erect, five or six inches long.

Temmamaçame seu Cervus Maçatl Chichiltic, *Seba* ?

Ovis Pudu. *Molina* ?

Icon. *Nobis*.

Habitat. Mountains of New Mexico.

Sub-genus XVI.—ANOEA. *Horns placed on the edge of the frontal crest, on the same plane with the face, exceedingly robust, slightly depressed, sub-triangular, short, straight, wrinkled and pointed; facial line straight; no sub-orbital opening?*

867. 60. \* *A. Depressicornis* (the Anoa.) Head nine inches long, straight ; horns, ten inches long, straight, very robust, slightly depressed at base, flat on the anterior side, sub-triangular two-thirds of their length, tapering suddenly to a sharp point, the rest nearly of equal thickness, rudely and irregularly wrinkled, and of a dark gray colour. Those of the female ? more slender, rounded at back ; face covered with close gray hair ; a broad muzzle.

*A. Compressicornis*. *Leach, MS. The Anoa, Loten, MS.*  
Idem, Var. B. of Buffalo, *Pen.*

Icon. The head and horns, *Nobis*.

Habitat. The Island of Celebes.

Genus II.—CAPRA.

Incisors  $\frac{2}{2}$  ; canines  $\frac{2}{2}$  ; molars  $\frac{2}{2}$  = 32. Horns common to both sexes, or rarely wanting in the females, in domesticated races, occasionally absent in both ; they are directed upwards, or depressed backwards, more or less angular, nodose ; no muzzle, no lachrymary sinus, nor inguinal pores ; eyes light coloured, pupil elongated ; tail short,

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flat, and naked at base; below the chin, bearded. Reside in the primitive and highest mountains of the ancient continent. The domestic varieties are more or less subject to modifications in their general characters.

868. 1. *Capra Ibez* (the Ibez.) Adult male, two feet eight inches high at the shoulder; five feet long from nose to tail; horns flat, with two longitudinal ridges at the sides, crossed by numerous transverse knots. They are subvertical, curved backwards, about thirty inches long, dark coloured, and very robust; ears short, pointed; legs strong; general colour, red-brown in summer, and gray-brown in winter; beard, short and dark; inside of ears, and under part of tail, white. Female, horns short, more erect, with three or four knots in front; general colour, earthy brown and ashy: the young gray.

Ibez, *Pliny, Gesner*. *Capra Ibez*, *Linn. et Auctor*. Bouquetin of the French. Steinbock of the Germans.

Icon. *Buff. Meisner. Nobis*.

Habitat. The snowy regions of the Alps, Pyrenees, Asturias, Apennines, Tyrol, &c.

869. 2. *C. Jaela*, Nob. (Abyssinian Ibez.) Adult male somewhat higher at the shoulder than the former; horns three feet long, subvertical, forming a semi-circle backwards, sub-triangular, round in front, with twenty-three irregular prominent knots, extending along the external surface, with several smaller at base, and interposed among the upper, of a dirty horn colour; beard short; general colour, dirty brownish-fawn, with a dark streak along the back; long hair under the throat.

Var? the Siberian Ibez, *Ibez Alpium Sibiricarum of Pallas*, pale gray and brown, black line on the back and down the front of the legs, black space on the upper arm, and under parts white.

Jaela, *Chaldaic*. Jaal, *Arabic*. Akko of *Deuteronomy*?  
Icon. *Nobis*.

Habitat. The Mountains of Abyssinia, Upper Egypt,  
Mount Sinai, and probably Persia.

870. 3. *C. Caucasica* (Caucasian Ibex.) Adult male equal in stature to the Alpine; horns triangular, the anterior edge obtuse, irregularly marked with transverse knots, and uniform wrinkles, but fewer and more distant than in the former, the horns twenty-eight inches, dark-brown, and less curved; general colour dark brown above, white beneath the breast, and line on the back dark. Female, horns nearly erect, slender, short, and wrinkled.

*C. Caucasica*, *Guldenstädt*. *Gmel*.

Icon. *Guldenstädt*, *Act. Petrop.* 1779.

Habitat. The summits of the Caucasian Mountains.

871. 4. *C. Ægagrus* (the Ægagrus.) Adult male nearly equal to the Alpine Ibex, in proportion longer, but lower; horns forming an acute angle to the front, rounded at the back, transversely ribbed, forming an undulating anterior edge, three feet long; head black in front; beard brown; general colour brown and gray, varying with the seasons; the female, with short or no horns.

*Capricerva* Paseng, *D. Garcia*, *ab Horto*. Monardes Paseng, *Kämpfer*. *C. Ægagrus*, *Pallas* and *Auctor*. Paseng, *G.* and *F. Cuvier*.

Icon. *Kämpfer*. *Pallas*.

Habitat. Mountains of Persia, Caucasus, the Chora-zan, Candia? The Alps?

Var? *C. Hircus*. Domestication of the Ægagrus, is supposed to have produced the greater number of breeds, spread over every part of the globe; we refer for the most remarkable to the text.

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872. 5. *C. Jemlahica* (the Jemlah Goat.) The male nearly equal in size to the Ibex; horns placed obliquely on the frontals, high above the orbits, nearly in contact, depressed, nearly flat, nine inches long, inclined outwards, then suddenly tapering, and turned inwards; anterior edge marked with seven small protuberances, from whence pass as many wrinkles, transversely to the rear; the colour ashy buff; facial line nearly straight; ears small; no beard, but the sides of the head and whole body covered with very abundant long hair of a dirty buff colour; dark streak down the face and along the spine.

*C. Jemlahica*, *Nobis MS.*

Icon. *Nobis.*

Habitat. The Jemlah chain of the Hymalaya Mountains, east of the Burrampoetra.

Var. The Cossus and beardless goats of Blainville; perhaps the Capricorn of Buffon, and *C. Depressa*. See the text.

### Genus III.—Ovis.

Incisors  $\frac{0}{8}$ ; canines  $\frac{0}{0}$ ; molars  $\frac{8}{8} = 32$ . Horns common to both sexes, sometimes wanting in the females; they are voluminous, more or less angular, transversely wrinkled, pale coloured, turned laterally in spiral directions, first towards the rear, vaginating upon a porous bony axis; the forehead and chaffron arched; they have no lachrymary sinus, no muzzle, nor inguinal pores; no beard properly so called. The females have two mammæ; the tail rather short; ears small; legs slender; hair of two kinds, one harder and close, the other woolly. In a domestic state the wool predominates, the horns vary or disappear, the ears and tail lengthen, and several other characters undergo modifications. The genus is gregarious in the mountains of the four quarters of the globe.

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873. 1. *Ovis Ammon* (Asiatic Argali.) Adult male about three feet high at the shoulder, and five feet in length; horns sometimes near four feet in length, and fourteen inches in circumference at base, placed on the summit of the head, touching in front, and covering the occiput, bending out backwards and laterally, then forwards and outwards; at base triangular; surface wrinkled; general colour fulvous-gray above, white beneath, with a whitish disk on the buttocks; hair close, concealing the wool beneath; female smaller, with slender wrinkled horns, nearly straight.

*O. Ammon*, *Erxl. Gmel.* *Capra Ammon*, *Lin.* *Ovis Argali*, *Bodd.* *Stepnie Barani*, *Gmel.* *Ophion of the Ancients.* *Artak*, *Rubruquis.* *Dishon of the Pentateuch?* *Pygargon of the Septuagint?* *Weisfarsh of the old German writers.*

Icon. *Pallas. Nobis.*

Habitat. The mountains and *Steppes* of Northern Asia, Tartary, Siberia, the Kurile Islands.

Var? *O. Pygargus*, *Nob.* (American Argali.) Adult male three feet high at the shoulder; four feet six inches in length; horns more spiral, fifteen inches in circumference at base, bent more forward, the tips generally broken off, more round at the base; no long hairs under the throat; colour dun rufous-gray; a large white disk on the rump; tail short; eyes pale bluish-gray.

Wild Sheep of *California.* *Venegas, Clavigero.* *Culblanc of the Canadians;* *O. Montana, Geoff.* *Big-horned Sheep of the Americans.* *O. Pygargus, Nob. MS.*

Icon. *Shaw. Natural Miscel. Geoff.* *Nobis* male and female.

Habitat. The Rocky Mountains, and North-west coast of North America.

874. 2. *O. Tragelaphus* (Bearded Argali.) Adult male

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three feet six inches at the shoulder ; five feet nine inches from nose to tail ; head one foot three inches ; horns two feet long, wrinkled, angular, black, thirteen inches and a half in circumference at base, and turned spirally back and downwards ; a large beard from the cheeks and under jaw, divided into two lobes ; neck short, lined with a standing mane ; knees covered by long dense hairs bent back ; general colour rufous-brown ; external hoofs of the fore-feet longer than the internal ; six incisor teeth.

*Tragelaphus, Caius in Gesner. Fishtall and Lerwee of Shaw.*

Icon—

Habitat. The mountains of Mauritania (Morocco.)

Var. Size of the Common Ram ; horns eleven inches in circumference, bending outwards and backwards ; no tuft or mane on the shoulders ; long tufts of hair round the fore-knees ; tail six or seven inches long ; general colour pale rufous.

Mouflon D'Afrique, *Geoff.* Bearded Sheep, *Pent. Ophion, Plin.*

Icon. *Mem. de l'Institut. d'Egypt.*

Habitat. The mountains of Upper Egypt.

875. 3. *O. Musmon* (the Musmon.) Adult male in size about the Common Ram, somewhat higher on the legs ; horns curved back, forming little more than a half circle, not so voluminous as in the Argali, points turned inwards ; general colour brown or liver-coloured gray, with some white upon the face and legs ; a darker streak along the back and on the flanks, and often black about the neck ; a tuft of hair beneath the throat ; females usually hornless and smaller.

Musmon, *Plin. Gesner. Mouflon, Buff. F. Cuv. Ovis Aries, Desmarests.* (Viewed as the parent of the domestic races, the following is a variety.)

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Icon. *Buff. F. Cuv. Mam. Lithog. Nobis* male and female.

Habitat. The mountains of Corsica, Sardinia, and Candia? It was formerly common in those of Asturias, and probably in most of the high chains of Europe.

Var. *O. Aries* (the Domestic Sheep.) Both sexes in general furnished with more wool than hair; the horns frequently wanting, when present, less robust, more angular, wrinkled, spirally contorted in various directions; colour most usually white. For the distinctive marks of the principal breeds or races, we refer to the text.

Genus IV.—DAMALIS.

Incisors  $\frac{0}{0}$ ; canines  $\frac{0}{0}$ ; molars  $\frac{6}{6}$  = 32. Horns common to both sexes, or in the males only, situate upon the frontal crest, variously bent, and the osseous core provided with a basal cavity communicating externally by a sinus passing beneath the horny sheath; the head heavy, long; the neck short; the spinous processes of first vertebræ of the back mostly elevated, and the croup often depressed; the body bulky; the legs stout; the tail pendulous, more or less lengthened; a mane and beard or tuft usual, and the dewlap wholly or partially developed; the stature of the species in general large.

Sub-genus I.—ACRONOTUS. *Horns common to both sexes, with double flexures more or less pronounced, approximated at base, annulated below, smooth and turned back at the tips; head narrow, long; muzzle small or none; small lachrymary opening; no tufts on knees; inguinal pores; the shoulders in general much elevated; the croup depressed; tail terminated by a tuft reaching to the houghs; two or four mammæ; not remarkable for speed: confined to Africa.*

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876. 1. *D. Bubalis* (the Bubalis.) Adult male larger than the Stag; horns about thirteen inches long, robust, black, nearly in contact at base; oblique, grooved, then diverging, bent forwards, and the tips turned back; the eyes high in the head; a distinct lachrymary sinus; the shoulders very high; croup much depressed; hair short, smooth, wholly yellowish-dun.

*Βουβαλος*, *Arist. Opp.* *Bubalis*, *Plin. Le Bubale*, *G. Cuv.*  
Icon. *Buffon. Nobis.*

Habitat. Northern Africa.

877. 2. *D. Caama* (the Caama.) Adult male five feet high at the withers; shoulder not so elevated as in the former; seven feet six inches from nose to tail; female considerably less; the head longer; horns placed upon a ridge above the frontals, very close at base, robust, black, diverging, turned forwards and the points backward, five or six prominent knots on the anterior surface, black spot at their base; from the forehead a black streak to the nostrils; the chin a narrow line on the ridge of the neck; streak down the fore-legs, and one on the middle of the thigh, black; general colour of the fur pale fulvous or lively ochre; large triangular spot of white on the buttocks, as also the inferior parts of the body; mammæ two.

Hartebeest, *Sparrman. Le Caama*, *G. Cuv.*

Icon. *Sparrman. Nobis* male, female, and calves.

Habitat. Caffraria.

878. 3. *D. Suturosa* (the Collared Damalis.) An adult female about four feet long; tail one foot; body long, bulky; stature low, heavy; head large; neck short; eyes small; no suborbital sinus; horns large, annulated, round, with double flexures, nearly vertical at base, then abruptly bent backwards and outwards, and the tips again upwards and to the rear; tail flat at base, stiff, tapering,

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with a tuft at the end reaching to the heels; mammæ four; general colour gray-brown and yellowish above, white beneath about the feet, lips, croup, and tail; forehead marked with a dark space, with a white spot above, and two smaller of the same colour behind the eye and ear; three bars of longer hair forming a kind of collars descend from behind the ears to the throat, from the nape to the sides of the neck, and the third forming a crest on the ridge of the neck descends to the throat. On the back and several other parts there are tufts of long hair, which is in part directed forwards and in part towards the tail.

Antilope Suturosa, *Otto*.

Icon. *Berlin Transactions*.

Habitat. Probably Africa. The species seems to approach *Gazella Mytilopes*.

879. 4. *D. Senegalensis* (the Koba.) Male head fourteen inches and a half long, facial line convex, dark streak down the nose; muzzle broad and black; cheeks paler brown; lachrymary sinus not evident; horns on the summit of frontals above the plane of occiput, nineteen inches and a half long, five inches and a half from tip to tip, curved backwards and inwards, seven inches in circumference at base, and marked with five or six semi-annuli, and then with sixteen annuli; size equal to a stag; general colour dark rufous, dirty white beneath, and tail with long hair.

*A. Senegalensis*, *Auctor*. *A. Koba*.

Icon. Skull in *Buffon*. Head *Nobis*.

Habitat. Central Africa.

880. 5. *D. Lunata*, *Nobis* (the Sassayby?) An adult female four feet six inches long, about three feet high at the shoulder, two feet eight inches at the croup; horns robust, on the summit of the frontals turning outwards, and forming two semi-circles with the points inwards, with

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twelve indistinct annuli; neck short; body bulky; head broad; dark streak down the face; general colour a deep blackish purple-brown above, more fulvous beneath; ears six inches and a half long; small lachrymary sinus; facial line straight; tail middle-sized, covered with long black hair; mammæ?

The Sassayby, *Daniell*. D. Lunata, *Nobis MS.*

Icon. Sassayby, *Daniell*. D. Lunata, *Nobis.*

Habitat. The Booswana country, South Africa.

Sub-genus II.—*BOSELAPHUS*. *Horns common to both sexes, heavy, very robust, placed on the summit of the frontals, transversely wrinkled, straight or slightly bent with tips forward, brown or gray in colour, twisted on their own axis, which is in a prolonged direction with the plane of the face, a ridge more or less prominent forming one spiral turn round them; a large sinus in the base of the nucleus, the rest partially porous; a muzzle; no suborbital sinus; mane on the neck; broad and deep dewlap edged with long hair; females an udder of four mammæ; stature very large; species confined to Africa.*

881. 6. *D. Oreas* (the Impofo.) Adult male above five feet high at the shoulder, nine feet long, and weighing eight hundred pounds; forehead square; muzzle broad; facial line straight; horns about two feet long, straight, with a ponderous ridge ascending in a spiral form to near the tips; proportions of the body like a bull, above seven feet in girth behind the arms; neck thick; shoulders very high; larynx very prominent; dewlap fringed with long hair; a crest of bristles from the forehead passing upwards and recurrent along the ridge of the neck; croup depressed; tail two feet long, with a large tuft of coarse hair; hide black; general colour rufous-dun and ashy; females smaller; horns more slender and longer.

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Ant. *Oreas*, *Pallas*, &c. Coudou, *Buff.* *Canna*, *Gordon*.  
Eland Gazelle, *Sparrm.* Impofo, *Poffo of the Caffres.*

Icon. *Sparrman's Travels*, &c. *Nobis*, male and female.

Habitat. Gregarious in South Africa.

882. 7. \* *D. Canna* (the *Canna*.) Adult male somewhat smaller than the Impofo, more slender; head shorter; horns without prominent spiral ridge, but obtusely angular in front and feint, twisting this angle into a spiral curve: they are more parallel, very closely wrinkled, and bent back beneath the facial line with the point forward, seventeen inches long in a male, twenty-two inches in a female; narrow dark streak down the forehead; small lachrymary or rather prolonged inner canthus of the eyes, with a dark angular spot beneath; shoulders not much elevated; mane on neck not recurrent; general colour a mixed tone of dark gray brown; sternum white; limbs nearly black.

Bastard Eland of the Dutch Colonists. *D. Canna*, *Nobis MS.* Y'Gann of the Hottentots.

Icon. In the Banksian collection by Mr. Foster. *Nobis*. *Daniell's Sketches*, &c. of Southern Africa.

Habitat. South Africa, principally beyond the Gareep.

Sub-genus III.—*STREPSICEROS*. *Horns in the male only, smooth, without wrinkles, pale coloured, with dark tips, forming regular spiral curves, and issuing from the summit of the frontal crest; the nucleus with a cavity at base, and porous above; a broad moist muzzle; real dewlap; long mane on the neck; a beard on the chin; white streak over the eyes; ears broad; shoulder elevated; tail covered with long hairs; females having an udder of four mammæ; stature large. Group confined to Africa.*

883. 8. *D. Strepsiceros* (the Koodoo.) Adult male four feet high at the shoulder; above eight feet long; horns

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bulky, compressed, with an anterior ridge, forming with the horn two complete spiral circles, the tips turned outwards and forward; colour pale, tips dark with a white point, and three feet long; chaffron straight; muzzle very broad; ears oblique, very broad tips, pointed; neck thick; withers elevated; dewlap anteriorly square; forehead black, a white line passing over the orbits, unites on the chaffron; chin white-bearded; long fringe of hair on the dewlap, and on the neck a standing mane; general colour of the fur a buff-gray, marked with a white line along the spine, and intersected by four or five others running downwards towards the belly, and four more across the croup; buttocks white; colour beneath rufous; tail white above, edged with rufous and black at the end; female hornless, and with fewer and fainter white markings.

Strepsiceros, *Caius apud Gesn.* Condoma, Coesdoes, Buff. Coudou, Vosmaer. A. Strepsiceros, Auctor. Striped Ant. Penn.

Icon. Mr. Daniell.

Habitat. The Cape Colony in the rocky plains of the Karoo Mountains.

NOTE. To this group belong the *A. Torticornis* of Herman, and probably the horn figured by Afzelius, for which we refer to the text in the work.

Subgenus IV.—PORTAX. *Horns in the males only, placed on the sides of the frontal crest, short, robust, sub-angular, without rings; cavity in the nucleus? a complete muzzle; deep suborbital sinus; elevated shoulders; depressed croup; bulky short body; mane on neck; tuft of hair on throat; small dewlap, and vaccine feet and tail; stature large; confined to Asia.*

884. 9. *D. Risia* (the Neelghau.) Adult male about four feet four inches at the shoulder; four feet at the

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croup; shoulders high; neck arched; head long, and pointed; forehead arched; horns rising at the sides of frontals, subtriangular, thick at base, with a ridge towards the front, bending forward and upwards, black, smooth, seven inches long; lachrymary sinus considerable; muzzle broad; ears broad, marked with two black streaks on the inner surface; mane erect, black, reaching upon the withers; long dark tuft on the throat to dewlap; general colour slaty-gray, browner on the legs; pasterns often marked with one or more white rings; tail with a black tuft; female smaller, rufous ashy-gray.

Ant. *Picta*, *Auctor*. White-footed Antelope, *Pent*. *Ris'ya* or *Rishya* of the *Sanscrit*. *Neelghau* of *Northern Indostan*. *Gaw-zan* of the *Penjab*.

Icon. *Buffon*, *Pent*. *Nobis* male and female.

Habitat. Northern India.

### TRIBE V.—*Bovidae*.

Horns persistent, common to both sexes, vaginating upon a bony nucleus, not solid but more or less porous, and cellular; the horny sheath increasing by ringlets at the base; the horns round, without annuli, striæ, or ridges; invariably placed upon or at the sides of the frontals, never straight, but at first always bending outwards or forwards; a broad muzzle, almost always naked; no lachrymary sinus; neck short; breast and shoulder deep, more or less dewlapped; structure powerful; vertebræ of the tail often prolonged below the hough; no inguinal pores; females always bearing an udder; stature large; manners gregarious.

### Genus I.—*Catoblepas*.

Incisors  $\frac{0}{8}$ ; canines  $\frac{0}{8}$ ; molars  $\frac{4}{8} = 32$ . Head square; horns flat and broad at base, nearly joining on the crest of the frontals; lying outwards, turning down with the

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points uncinating upwards; muzzle broad; nostrils as in the Ox, but provided internally with a moveable valve; glandulous excrescence on the cheeks; a mane on the neck; considerable beard beneath the throat; a small dewlap; bristles round the orbits and on the lips; ridge of hair on the chaffron; carcass round; tail hairy, as in the horse; legs clean and firm; gregarious. Reside in Africa.

885. 1. *C. Gnu* (the Gnoo.) Adult male three feet ten inches high at the shoulder, five feet six inches long; head square; shoulder deep; body round; a pillow of fat on the haunches; legs long and clean; horns dark, broad upon the summit of the head, tapering out sideways over the eyes, and turning up into a pointed hook; black bristly hair upon the face; a tuft of similar hair beneath each eye, concealing a gland; the ears are short; white bristles surround the eye, and spread on the legs; a vertical mane on the neck, black in the centre, white at the sides; a bushy beard on the under jaw, and dark-brown fringe along the throat, down to between the fore-legs; tail lined with long white hair; general colour of the fur deep brown; hoofs pointed, blue-black; females smaller; base of horns less approximated, covered with coarse hair; calves pure white.

Antelope Gnu, *Auctor*. The Gnu of *English*. A. Niou of *French Authors*. Gnoo of the *Hottentots*. Wilde Beest of the *Dutch Colonists*:

Icon. *W. Daniell*. *F. Cuiver*. *Nobis* in all its states.

Habitat. The Karoo Plains of South Africa.

886. 2. *C. Taurina* (the Kokoon.) Adult male nearly four feet six inches high at the shoulder; much lower at the croup, and five feet from the breast to the rump; head, neck, and shoulder, excessively thick and strong; head

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shorter and broader in proportion; eyes very high in the head; horns less broad at base, marked with irregular rugosities at the roots, more distant at base, black, bent down sideways behind the ears, and then suddenly turned upwards, but not to the front; forehead high between their bases; head one foot ten inches long; ears ten inches; tail three feet three inches, covered with long black hair; neck with a long flowing dark mane, reaching beyond the withers; a cartilaginous protuberance covering the chaffron, and furnished with long black hair; large circular glandulous naked spot, distilling a viscous humour beneath each eye; chin covered with dark bristly beard, descending down the dewlap to the breast; general colour dark ashy-gray.

Cocong, *Lichtenstein's Travels*. A. Taurina, *Burchell*. Kokoon, *Somerville and Daniell*.

Icon. *Daniell's Sketches of Southern Africa*, 1820. *Nobis*.

Habitat. Country of the Caffres, South Africa.

887. 3. \* *C. Gorgon* (the Brindled Gnoo.) A. male? larger than the Gnoo; horns placed close together, white, round, standing up, bent outwards, and the points turned towards each other, and black; forehead and chaffron covered with irregular depressions; nose and mouth flat and square; ears short; long flowing mane on neck, extending beyond the withers; no beard on the under jaw; long black hairs on the throat and dewlap; tail black, but shorter than in the former; general colour dirty-dun and sepia-gray, variegated with obscure streaks or brindles; four or five cross streaks on the upper arm.

Bastard Wilde Beest of the Dutch Colonists.

Icon. *Nobis*. *Howitt*.

Habitat. The interior of South Africa.

NOTE. In Mr. Brook's collection a horn thirteen inches and a quarter long, base nearly flat, very open, forming a triangular figure, and terminating in a rounded point, bending back and then forward, the base extremely rugous and pearly, the point smooth, all shining black. In our MS. collection noted as *C. Brooksi*.

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### Genus II.—OVIBOS.

Body low and compact; legs short, clean; feet hairy under the frog or heel; forehead broad, flat; no suborbital sinus; a muzzle, but not naked though square; horns common to both sexes, in contact on the summit of the head, flat, broad, then tapering and bent down against the cheeks with the points turned up; the ears short, placed far back; eyes small; tail short; mammæ two? hair very abundant, long, and woolly; stature large. Reside in northern latitudes.

888. 1. *O. Moschatus* (the Musk-Ox.) Adult male size of a small cow; horns and characters as noticed above; colour of the hair brownish-black, hanging low down to the ground; feet often white; in the female the horns do not form a complete scalp; the frog in the hoof soft, transversely ribbed, and partially covered with hair; the external hoof larger and round, the internal pointed and crooked; swell of musk very powerfully.

*O. Moschatus*, *Blainv. Desm.* *Bos Moschatus*, *Gmel.* Musk-Ox, *Pent* .Bœuf Musqué, *Cuvier.* Mistus, *Northern and Chippeway Indian.*

Icon. *Pennant, Howitt, Nobis, Parry.*

Habitat the latitudes of North America, adjoining the polar region, and south to the province of Quivira.

NOTE. The Fossil Musk Ox, *O. Pallantis*, with the horns pressed against the temples behind the orbits, found on the coasts of Siberia, is not definitively ascertained to be a separate species.

### Genus III.—BOS.

Skull very strong, dense about the frontals, which are convex, nearly flat or concave; horns invariably occupying the crest, projecting at first laterally; osseous nucleus

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throughout porous, even cellular; muzzle invariably broad, naked, moist, black; ears in general middle-sized; body long; legs solid; stature large.

Sub-genus I.—BUBALUS. *Animals low in proportion to their bulk; limbs very solid; head large; forehead narrow, very strong, convex; chaffron straight; muzzle square; horns lying flat or bending laterally with a certain direction to the rear; eyes large; ears mostly funnel-shaped; no hunch; a small dewlap; female udder with four mammæ; tail long, slender.*

889. 1. *B. Caffer* (the Cape Buffalo.) Adult male about five feet six inches at the shoulder, nine feet from nose to root of tail; horns spreading horizontally on the head, in contact at base, eight or ten inches broad, very ponderous, dark coloured, and above five feet from tip to tip, the internal nucleus very cellular, the points turned up; the incisor teeth loose; ears wide, rather hanging; under-jaw bearded; back straight; hide black, almost naked, and the end of tail furnished with a few distichous bristles; in the young much black longish hair, particularly about the ridge of the back.

*B. Caffer*, *Sparrm. et Auctor.* Cape Ox, *Pent.* Qu'araho of the Hottentots. *Zamouse?* in *Bornou.*

Icon. *Sparrman's Travels.* *Buff. Daniell.* *Nobis.*

Habitat. The interior of Africa.

890. 2. \* *B. Pegasus?* (the Pagasse.) A young male, the horns lying across the summit of the head, the tips turned up; colour darkish, with obscure transverse ridges; head very short, thick, abrupt at the nose; forehead wide; eyes large and full; the neck with a dense mane; ears long, flaccid, pendulous; tail to below the houghs covered with long woolly black hair; general colour deep brown; feet white.

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Pacasse, *Gallini* and *Carli*. Empaguessa, *Merolla*. Empacasse, *Lopez*, *Marmol*. Pegasus, *Pliny*. Wadan? *Captain Lyon's Travels*. B. Pegasus, *Nobis MS*.

Icon. Drawing in the Collection of Prince John Maurice of Nassau in the Berlin Library. *Nobis* a young specimen.

Habitat. Congo, Angola, Central Africa.

891. 3. \* *B. Arnee*. Adult male, said to be near seven feet high at the shoulders, three feet broad at the breast, and the horns from five and a half to six and a half feet long (each); face nearly straight; breadth of head descending from the summit of the frontals to the foremost molar; horns triangular, rising obliquely, wrinkled, brownish, slightly hanging forwards, with the points turned inward and backward; hide white; colour black; very hairy; tail with the tuft reaching little below the houghs.

*B. Arnee*, *Shaw*. *Arnee*, *Arnaa*, in *Indoostan*. Pfang? of the *Burmans*? *Taurelephantus*, *Ludolph*.

Icon. *Shaw's Zoology*? *Oriental Field Sports*. Horns, *Nobis*.

Habitat. The woody valleys at the southern foot of the Himalaya Mountains and in the Birman Empire.

The domesticated race, China, the Peninsula of Malaya, and Indian Archipelago.

892. 4. *B. Bubalus* (Domestic Buffalo.) Adult male five feet six inches high at the shoulder, eight feet six inches long; horns directed sideways, compressed, with a ridge in front, reclining towards the neck, and the tips turned up, placed at the side of the frontal ridge, and very solid; the forehead convex; mammæ of the male placed on a transverse line; hide dark or black; tail long, slender, tufted at end; hair coarse, scattered, black.

*B. Bubalus*, *Auctor*. *Bhain* in *Indoostan*. *Buflus* of the *Middle Ages*. *Buffie*, *Buffon*. *Yamus*, *Arabic*. *Buwol*, *Polish*. *Busan*, *Tartaric*.

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Icon. *Buffon. Fred. Cuv. Nobis.*

Habitat. In a wild state, India, &c. Domesticated, Persia, the Levant, Turkey, Hungary, Italy, and North Africa.

For the varieties and breeds we refer to the text.

Sub-genus II.—BISON. *Forehead slightly arched, much broader than high; horns placed before the salient line of the frontal crest, the plane of the occiput forming an obtuse angle with the forehead, and semi-circular in shape; fourteen or fifteen pair of ribs; the shoulders rather elevated; the tail shorter; the legs more slender; the tongue blue; and the hair soft and woolly.*

893. 5. *B. Bison* (the Bison.) Adult male six feet high at the shoulder, and ten feet three inches from nose to tail; head broad; horns distant, short, robust, slightly turned forwards, dark coloured; forehead arched; eye large, full dark; body with fourteen pair of ribs; mammae disposed in a square; anterior half of the animal, excepting the chaffron, covered with a heavy coat of mixed woolly and long harder hair, a foot long in winter, shorter in summer; the woolly gray, the long browner; throat and breast bearded.

*B. Bison, Le Bison, G. Cuvier, Gilibert. Bison, Pliny. Bison, Bisam. Wizend of the Germans. Subr, Polish. Aurochs of the Modern Germans.*

Icon. *Ridinger. Gilibert. Nobis.*

Habitat. At present the forests of Southern Russia in Asia, Carpathian and Caucasian Mountains, and the Desert of Kobi.

894. 6. \* *B. Gaurus* (the Gaur.) Adult male six feet high at the shoulder; twelve feet long to the end of tail: above seven feet six inches in girth; head resem-

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bling the Common Ox; forehead more arched; horns robust, not bent back, spinous processes of the withers, much elevated, *externally projecting?* forehead covered with whitish wool; eyes small, pale-blue; hair smooth, close, shining, brown; tail short, tufted.

Le Gaour, *Mem. du Mus. d'Hist. Nat. vol. ix.* Gaur, *Dr. Johnson's Sketches of Indian Sports.* B. Gaurus, *Nob. Gor of Firdousi*, mistaken for the Wild Ass.

Icon. —

Habitat. Rhamghur district, and other high mountain forests of India, *Æthiopia?* *Pliny*, 4. viii. c. 21.

895. 7. *B. Americanus* (American Bison.) Adult male above five feet high at the shoulder, four feet at the croup, eight feet long from nose to tail; form heavy in front, weak behind; body with fifteen pair of ribs, and only four Coccigian vertebræ; eye, round, dark, and full; chaffron short; forehead broad; muzzle wide; horns small, round, lateral, black, very distant, turned sideways, and upwards, hair woolly, very abundant on the head and shoulders; short and close on the hind quarters; in winter brownish black, in summer lighter; tail eighteen inches, with long tuft of dark hair.

*B. Americanus*, *Auctor.* B. Bison, *Linn. Erzleb.* Bison, *Fred. Cuv., Warden.* Buffalo of the *Anglo Americans.*

Icon. *Buff. Pennant. Nobis.*

Habitat. Interior of North America.

896. 8. *B. Poepagus* (the Yak.) Adult domestic variety, three feet ten inches high at the shoulder; seven feet long from nose to tail; forehead flat; lips tumid; muzzle small; occiput convex covered with frizzled hair; horns round, smooth, pointed, lateral, bending forward and upwards; withers very high, but not hunched; mammaræ four, placed transversely; ribs fourteen pair; hair

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on the neck and back, very woolly, whitish and black; tail with very long hair; sometimes hornless.

Poëphagus, *Ælian*. B. Grunniens, *Pallas* and *Auctor*. Sarlyk Ukur and Yak, *Tartar*. Ghau-nouk and Gawdashti, *Persian*. Soora Goy, *Indee*. Si-nyn, *Chinese*.

Icon. *Shaw's Zool. Trans. Soc. of Calcutta. Nobis. Pallas.*

Habitat. Mountains of Central Asia.

897. 9. *B. Gavæus* (the Gayal.) Adult male, four feet nine inches high, nine feet six inches long; horns strong, short, distant, lateral, compressed, turned upwards and forward; head broad and flat, narrowing suddenly on the chaffron; ridge of the frontals covered with frizzled white hair; eyes not large; ears long, broad, turned sideways; neck slender; a middle-sized dewlap, fringed with long hair; ridge of the withers much extending half way down the back; tail to the houghs: tuft at the end; general colour brown, with some white about the feet.

B. Gayal, *Linn. Trans.* Gauvera? in *Ceylon*. Shial (the wild) and Seloc of the *Cucis*. Catin? in *Siam*. J'hongnuakt, of the *Mugs*. Nunel of the *Birmas*. Gabay, in the *Shastras*. Bos Silhetanus, *Cuv.*

Icon. *Transactions of Asiat. Soc. Calcutta. Nobis.*

Habitat. The mountain forests east of the Burrampootra, Silhet, Chatgoon.—*Ceylon?*

*Obs.* For the fossil species, referrible to the Bisontine group, we refer to the text.

Sub-genus III.—TAURUS. Forehead square, from the orbits to the occipital crest, somewhat concave, not convex or arched, as in the former; the horns rising from the sides of the salient edge or crest of the frontals; the plain of the occiput forming an acute angle with the frontal and of quadrangular form; the curve of the horns outwards, upwards and

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*forwards ; no mane ; a deep dewlap ; thirteen pair of ribs ; tail long ; udder four teats in a square.*

898. 10. *B. Urus* (the *Urus*.) In a fossil state of colossal size ; the later *Uri* possessed of the above characters, but the horns turning downward and forward, excepting in two figures quoted in the text, in which they are forward with the tips turned up, white, the ends black : the form of a domestic bull, entirely black, excepting the chin, which is white.

Var. *Bos Scoticus*, smaller than the usual domestic bull, entirely white ; horns dark, pointing downwards ; a large breed of the same in *Hamilton Park*.

*Bos Urus*, *Herberstein*, *Cuvier*. The true *Aurox of the Germans*, *Thur*, *Polish*. *Wild Bull of Scotland*, *Pen. Shaw*.

Icon. *The Black Species*. *Herberstein*. *Nobis*. *The Scottish. Pent. Bewick*. *Nobis*.

Habitat. Formerly the forests of Middle Europe, *Lithuania*, *Massovia*, &c., probably the temperate parts of *Tartary*, the white species ; *England*.

Var. *Bos Taurus*, the *Domestic Ox*, has the same characters, varied by circumstances, for which we refer to the text, where the principal varieties are enumerated.

## ORDER VIII.—CETACEA.

**BODY** pisciform, terminated by a caudal appendage, cartilaginous and horizontal ; two anterior extremities formed like fins, the bones of which are very much flattened and short ; head joined to the body by a very short and thick neck ; cervical vertebræ very slender, and partly soldered together ; two pectoral or abdominal teats ; ears with very small external openings ; skin more or less thick, without hair ; brain large, hemisphere well developed ; bone of the

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internal ear separate from the head, or adhering by ligaments; two rudimentary bones lost in the flesh, represent the pelvis and posterior extremities.

Animals altogether *aquatic*, comprising the largest species in the world, *carnassial* for the most part; swim by the assistance of the tail, which moves up and down, and not from right to left like that of the Fish; viviparous; mammiferous.

Inhabit almost all seas; the very large species the more northern; the herbivorous nearer the equator.

### Family I.—SIRENIA (HERBIVOROUS CETACEA.)

Molars with flat coronal; sometimes tusks in the upper jaw; teats two, pectoral; mustachios; nostrils, properly so called, at the end of the muzzle; nasal apertures in the osseous head situated above; body very massive.

#### Genus I.—LAMANTIN. *Manatus*.

*Rondelet, Lin., Scopoli, Storr, Lacep., Cuv., Geoff., Illig. Trichecus, Linn., Erxleb., Schreb., Shaw, Gmel. Manati, Bodd.*

Incisors  $\frac{1}{2}$ ; canines  $\frac{1}{2}$ ; molars  $\frac{3}{2}$ =38. Incisors very small, exist only in the foetus; adults have but thirty-two teeth, four molars being lost when young; two transverse hillocks on the coronal of the molars; head not distinct from the body; eyes very small, placed above, between the auditory foramina and the end of the muzzle; auditory foramina hardly visible; tongue oval; hinder part of the body very thick, depressed, and rounded at the end; no caudal fin properly speaking; some vestige of claws on the edges of the pectoral; mustachios, composed of a bundle of enormous hairs directed downwards, and forming a kind of corneous tusk on each side; naked skin, thick and rugous; six cervical vertebræ; six pair of ribs, thick and

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clamsy, the two first only united to the sternum; stomach divided into several pouches; bifurcated cæcum; inflated colon.

These animals live in troops, and feed only on vegetable substances.

Inhabit the shores of the Atlantic towards the mouth of the great rivers of the western coast of Africa and the eastern coast of South America.

899. 1. *Manatus Americanus* (American Lamantin.) Osseous head, rather elongated in proportion to breadth in the region of the muzzle and nostrils; nasal foramina thrice as long as broad; zygomatic apophysis of the temporal very high; lower edge of the lower jaw strait; sometimes twenty feet long.

Manati Phocæ genus, *Clus. Exot. p. 132.* Manate ou Vache Marine, *Dampier's Voyage, tom. i. p. 46.* Sea Cow, *Sloane's Jamaica, vol. II. p. 529.* La Condamine's Voyage, p. 154. Grand Lamantin des Antilles, *Buff. Hist. Nat. tom. XIII. p. 377 and 425.* *EjUSD. Suppl. tom. VI. p. 396.* *Cuv. Ann. Mus., tom. XIII. p. 282.* *EjUSD. Recherch. sur les Oss. Foss. tom. IV. Mem. sur les Phoques Desm. Nouv. Dict. d'Hist. Nat. tom. XVIII. p. 213.* *F. Cuv. Nouv. Dict. des Sci. Nat.*

Icon. *French. Encyc. pl. 112 fig. 2 and 3.* *Clus. ut supra.* *Buff. ut supra, pl. 57.* *Cuv. Ann. Mus. ut Sup. pl. 19.* *Mem. sur les Phoque. Nouv. Dict. d'Hist. Nat. tom. XVIII. pl. G. 9.*

Inhabits the river of the Amazons, the Orinoco, Cayenne, the Antilles. Grown rare in frequented places.

*Obs.* The Baron cannot affirm if the Lamantin, placed by some authors on the coasts of Peru, be of this species or not.

900. 2. *M. Senegalensis* (Lamantin of Senegal.) Head

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short in proportion to breadth ; breadth of nasal foramina equal to three-fourths of length ; zygomatic apophysis of the temporal, slightly elevated ; lower edge of lower jaw curved. About eight feet long.

Lamantin du Senegal, *Adanson's Voy. Dapper, Afric.*  
*Trichecus Australis, Shaw, Gen. Zool. Buff. tom. xlii.*  
*Suppl. tom vi. Cuv. Ann. Mus. Recher. Sur less. Oss. Foss.*  
*Icon. Shaw. Oss. Foss.*

Manners unknown.

Habitat. Mouth of the Senegal River, and other great rivers of the western coast of Africa.

Genus II.—DUGONG. HALICORE. Illig.

Incisives (*adult*)  $\frac{3}{3}$  ; canines  $\frac{0}{0}$  ; molars  $\frac{3}{3} = 14$ , (*young*)  
 Incisives  $\frac{3}{3}$  ; canines  $\frac{0}{0}$  ; molars  $\frac{3}{3} = 32$ . Four upper incisors, two of which cylindrical, strait and strong, form real tusks ; two very small behind these, only found in the young. Anterior face of the lower jaw truncated obliquely ; eight alveoli on two lines, containing teeth never developed. First molar in the adult cylindrical and worn obliquely, and in a hollow at point ; second cylindrical, with flat coronal ; third formed of two cylinders united, and truncated at top. Body pisciform, terminated by a horizontal fin, with two lobes ; head not distinct from body ; muzzle very thick, truncated, and mobile, furnished with very thick spiny hairs on the edge of the lips ; nostrils very small, separated in front of the eyes ; eyes small ; tongue soft, partly fixed ; fins short, without distinct fingers or claws ; seven cervical vertebræ ; eighteen pair of ribs ; stomach two pouches, and two cæcal appendages ; heart bifurcated, each ventricle forming a particular lobe ; penis with voluminous and bifid gland.

901. 3. *H. Indicus* (Dugong of Indian Seas.) General

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colour bluish-gray; seven or eight feet long; greatest circumference three or four; length of tusks an inch and a half.

Dugong. *Renard* *poiss. des Indes*. Dugong *Buff. tom.* xiii. Indian Walrus, *Pent.* Trichecus Dugong, *Erzleb.* Trichecus Dugong, *Gm.* Rosmarus Indicus, *Bodd., Camper, Raffles. Home, F., Cuvier.*

Icon. *Renard, Buff.* Cranium, *Camper, Trans. Philos.*  
Habitat. Indian Seas.

*Obs.* The Malays distinguish two varieties, the second shorter and thicker than the first.

Genus III.—STELLERE. STELLERUS, CUV.

Incisives  $\frac{0}{0}$ ; canines  $\frac{0}{0}$ ; molars  $\frac{1}{1} = 4$ . No teeth implanted, but a molar plate on each side of the jaws, not attached by roots, but by a number of small vessels and nerves; body inflated towards the centre, diminishing gradually to the caudal fin; head obtuse, without distinct neck; no external ears; lips double; a cartilaginous membrane to cover the eyes; palmated fins like the Sea-Tortoise; caudal fins very broad, crescented, and pointed at each end; skin covered by a very thick epidermis, composed of serrated tubes, perpendicular to the dermis; stomach simple. Eats fucus.

Habitat. The most northern part of the South Sea, western coasts of North America, &c.

902. 4. *Stellerus Borealis* (Northern Stellere.) Round head; no tusks; twenty-three feet long.

Manatus, *Steller.* Trichecus Manatus, *Var. Boreal.* *Gmel.* Trichecus Borealis, *Shaw.* Whale-tailed Manati, *Penn.* Grand Lamantin du Kamtschatka, *Sonnini.*

Icon. — ?

Habitat. See Genus.

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### Family II.—CETE (COMMON CETACEA.)

Teeth sometimes pointed, sometimes obtuse; all of one sort on the edges of the jaws; sometimes no teeth, but transverse corneous laminæ in the vault of the palate; two anal mammæ; nostrils opening on the top of the head to eject water, called *spiracles*; olfactory nerve small; larynx pyramidal, penetrating the back; nostrils flattened; eyes with thick sclerotica; smooth tongue; no hairs, eyelash, or mustachios; skin smooth and shining, covering a thick coat of fat; stomach with five and sometimes seven pouches; spleen divided into many separate lobes.

#### TRIBE I.—*Small-headed Cetacea.*

Head in the usual proportion with body.

#### Genus I.—DELPHINUS, Linn. (Dolphin.)

Teeth of one sort, canine form, compressed and indented on their trenchant edge; number very variable, two hundred at most, two at least, or none; jaws more or less advanced, beak-formed; no tusks; spiracles with a common and crescented aperture above; sometimes an adipose dorsal fin; sometimes a longitudinal dorsal fold of skin; tail flattened horizontally, and bifurcated; no cæcum; carnassial.

Sub-genus I.—DELPHINUS (DOLPHINS PROPER) Cuvier.  
*Muzzle elongated into a moderate beak; large at base, rounded at point; jaws widened posteriorly, with edges furnished with numerous teeth: a single dorsal fin.*

903. 1. *D. Delphis* (Common Dolphin.) Jaws moderately elongated, of equal length, forty-two to forty-five teeth each side, fine, round, pointed, arched, equidistant, from forty-two to forty-five in each jaw; dorsal fin placed be-

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yond one half the middle of the back ; upper parts black ; under white.

*Delphinus Delphis*, Linn., Lacepède, Bonnaterre, &c.

Icon. *Encyc. Cetologie*, pl. 9, 10. fig. 2.

Habitat. The Seas of Europe.

904. 2. *D. Tursio* (Great Dolphin.) Jaws moderate, the lower a little longer ; teeth strait, obtuse, three and twenty in each side above, and one and twenty below ; dorsal fin as in the last ; back blackish ; belly white.

*Delphinus Tursio*. Nesarnak, *Bonnat. Cetol.* *Delphinus Delphis*, Hunter. Coudin or Caudrieu, *Duhamel. Lacep.*

Icon. *Encyc. Cetol.* Hunter.

Habitat. European Seas.

905. 3. *D. Nesarnak*. Compressed muzzle ; teeth twenty or twenty-three on each side ; thick, strong, obtuse, and couched obliquely from front to back, below, and the reverse above ; body thick.

Nesarnak, *Oth. Fabricius*.

Icon. —

Habitat. Sea of Groënland.

906. 4. *D. Niger* (Black Dolphin.) Muzzle flat and elongated ; above twelve teeth on each side ; very small dorsal fin near the caudal ; general colour black ; commissure of the lips, edge of the pectoral and dorsal fins, white.

*Delphinus Niger*, Lacep.

Icon. —

Habitat. Japanese Seas.

*N. B.* Known only from a figure seen by M. de Lacepède.

907. 5. *D. Rostratus* (Slender-beaked Dolphin.) Long slender muzzle ; teeth twenty-two to twenty-six on each side ; conical, a little curved, with rugous surface.

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Dauphin à bec Mince. *Delphinus Rostratus*, *Cuv. Rapp. sur les Cetac. Ann. du Mus. Desm. Nouv. Dict. d'Hist. Nat.*

Icon. —

Habitat. —. The great freshness of a head in possession of Mr. Sowerby induces M. de Blainville to think the species European.

908. 6. *D. Frontatus* (Fronted Dolphin.) Slope of the frontal convexity more abrupt; beak more defined; teeth twenty-one, twenty-two, or twenty-three on each side; seven feet long.

*Frontatus*, *Cuv. Oss. Foss. Dauphin, de Geoffroy, Desm.*

Icon. — ?

Habitat. Doubtful.

NOTE. Of this Sub-genus *Delphinus Boryi*, *D. Linensis*, *D. Dalius*, *D. Orca*, *D. Feres*, *D. Canadensis*, *D. Bertini*, being all marked as doubtful by M. Desmarest, and so considered by the Baron, we forbear to insert them. The same may be said of M. Rafinesque Smaltz's Sub-genus OXYPTERUS, characterized by two dorsal fins, and of which the only species is *D. Mongitori*, observed but once, and having no description or figure. Should the above character be correct, this animal must be distinguished not only from the Dolphins, but from all the other Cetacea.

Sub-genus II.—PHOCÆNA (MARSOUIN.) *No beak; muzzle short and convex; numerous teeth in each jaw; dorsal fin.*

909. 1. *D. Phocæna* (Dolphin Marsouin.) Body and tail elongated; muzzle rounded; teeth compressed, trenchant; twenty-two to twenty-five in each side of two jaws; dorsal fin about the middle of the back, almost triangular and rectilinear; colour blackish above and white below; total length four or five feet.

*Phocæna, Rondelet. Delphinus Phocæna, Briss. Linn. Gmel. Bonnaterre, G. Cuvier. Dauphin Marsouin, Lacep. Merschswain of the Germans. Porpus with us, &c.*

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Icon. *Encyc. Cétol. Cuvier Menag. Nat. Lacep. Cét.*  
Habitat. All our seas.

910. 2. *D. Gladiator* (Sword-fish.) Body and tail elongated; head convex; muzzle short and rounded; jaws equal; teeth sharp and curved; dorsal fin near the neck, and elevated one-fifth of the length of the body; twenty-three to twenty-five feet long.

Swerd-fisch, *Anderson*. Poisson à Sabre, *Pagès*. Delphinus Maximus, *Olafsen*. Dauphin Epée, *De Mer. Bonnaterre*. D. Gladiateur, *Lacep. Cuv. Règne. An.*

Icon. *Lacep.*

Habitat. Sea of Spitzbergen, Davis's Straits, coast of New England.

*Obs.* This is joined to the following by the Baron.

911. 3. *D. Grampus* (Grampus.) Colour blackish above; white belly; twenty-five feet long.

Epaulard, *des Saintongeois*. Orca, *Oth. Fred. Muller*. Butkopf of the Dutch. Our Grampus. D. Grampus, *Hunter*. D. Orca, *Linn., Gmel., Shaw*. Dauphin Epaulard, *Bonnaterre*. Cachalot d' *Anderson, Duhamel*.

Icon. *Shaw, Lacep., Duhamel*.

Habitat. North Atlantic.

912. 4. *D. Peronii* (Peron's Dolphin.) Forms, proportions, and size of the Porpus; back bluish-black; belly, sides, end of muzzle, fins, and tail, bright white.

Dauphin du Peron, *Lacep.* Dauphin Leucorampe, *Peron*.

Icon. —

Habitat. Great Austral Ocean.

913. 5. *D. Commersonii* (Commerson's Dolphin.) Silvery

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white; extremities of muzzle, fins, and tail, blackish; a little larger than *D. Phocæna*.

Dauphin de Commerson, *Lacep.*

Icon. —

Habitat. From Cape Horn to the further point of America.

914. 6. *D. Griseus* (Gray Dolphin.) Head like the Porpus; dorsal fin much elevated and pointed; gray on the upper parts, gradually blending with the white underneath; two-thirds smaller than the Grampus.

Dauphin Gris. *Delphinus Griseus, Cuv. Rapport sur les Cet. and Ann. du Mus. Schreb. Goldfuss.*

Icon. *Ann. du Mus. tom. XIX.*

Habitat. Taken in the neighbourhood of Brest.

915. 7. *D. Globiceps* (Round-headed Dolphin.) Summit of the head very convex; muzzle rounded; dorsal fin not high, sloped behind; pectorals long and pointed; teeth nine to thirteen each side; blackish gray or shining black.

*D. Globiceps, Cuv. Rapp. sur les Cet. Ann. Mus. Schreb. Goldfuss.*

Icon. *Ann. du Mus. Schreb. Goldfuss.*

Habitat. The Atlantic Ocean.

*Obs. D. Ventricosus* and *D. Rissoanus* are doubtful. The first the Baron joins to *Epaulard*. The second he considers as approximating to the first, and of course to *Epaulard*.

Sub-genus III.—DELPHINAPTERUS (LACEP.) *Head obtuse; muzzle not prolonged, beak-formed; number of teeth middling; no dorsal fin.*

916. 1. *D. Leucas* (the Beluga.) Head like the Porpus; teeth short, blunt, nine on each side in both jaws, the lower oblique from front to back, the upper the reverse;

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very small dorsal eminence instead of fin; yellowish white; twelve to eighteen feet long.

Witfisch oder Weissfisch, *Anderson, Crantz, Muller*. Delphinus Albicans, *Oth. Fabr.* Delphinus Pinna in dorso nulla, *Briss.* Dauphin Beluga, *Bonnat. Ency. Cet. D.* Leucas, *Gm.* Delphinopterus Beluga, *Lacép.* Beluga, *Shaw.* Huitfisch of the Danes.

Icon. *Shaw.*

Habitat. Northern Seas.

Sub-genus IV.—HYPEROODON (LACEP.) *Teeth one in each jaw, sometimes none; lower jaw usually more voluminous than the upper.*

917. 1. *D. Hyperoodon* (Dolphin of Honfleur.) Head convex, beak round and flattened; no teeth in either jaw; palate furnished with small points or false teeth; lower jaw very thick in proportion to upper; orifices of spiracles crescented, points turning back; dorsal fin near the middle of the body; leaden gray above, whitish below; twenty-three feet long.

Dauphin Butskopf. Delphinus Butskopf, *Bonnat. Bausard desc. des deux cet. Journal des Phys.* Hyperoodon Butskopf, *Lacép.*

Icon. *Journ. de Phys. March, 1789, pl. 1 et 2.*

To this Sub-genus are referred *D. Anarnak*, *D. Chemnitzianus*, *D. Hunteri*, *D. Edentulus*, *D. Epiodon*. None sufficiently authenticated to be considered as specifically different from *D. Hyperoodon*.

## Genus II.—MONODON, L.

Incisors  $\frac{1}{6}:\frac{1}{4}$ ; canines  $\frac{0}{6}:\frac{0}{3}$ ; molars  $\frac{0}{6}:\frac{0}{6} = 2$ . One or two large tusks implanted in the incisive bone, straight, long, and pointed, in the direction of the axis of the body; general form like the Dolphin's; orifice of spiracles united

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on the highest part of the head behind; longitudinal dorsal projection, not; fin pectorals, oval; manners like the Dolphin's; carnassial. Inhabits the Northern Seas.

918. 1. *Monodon Monoceros* (Common Narwhal.) General form ovoid; length of head one-fourth that of the animal; left tusk unique (the right not being developed), of spiral form, one half as long as the body; back uniformly grayish in the young, blackish or marbled in the old; twenty or twenty-two feet long.

*Monodon*, *Artsedi*. Narwhal, Oder Einhorn *Anderson*, *Muller*. *Monodon* Narwhal, *Fabri*. *Monodon Monoceros*, *Lin.*, *Erz.*, *Gm.* Narwhal, *Bonnat*. Narwhal *Vulgaire*, *Lacep.*, *Shaw*, *Vulgo*. Sea-Unicorn.

Icon. *Encyc. Cet. Lacep. Shaw*.

Habitat. Eightieth degree of North latitude.

*Obs.* *M. Microcephalus* and *M. Andersonianus*, not authenticated. The last is represented as having smooth tusks.

### TRIBE II.—*Large-headed Cetacea*.

#### Genus I.—*PHYSETER*, Linn.

Lower teeth eighteen to twenty-five each side of the jaw; upper jaw wide, elevated, without corneous laminae or teeth, or with short and undeveloped ones; lower jaw elongated, narrow, corresponding to a furrow of the upper; thick and conic teeth entering corresponding cavities in the upper; orifice of spiracles united at the end or near the upper end of the muzzle; dorsal fin in some species, simple eminence in others. Large cavities with cartilaginous walls in the upper region of the head, communicating with diverse parts of the body by particular canals, filled with an oil which fixes and crystallizes when cool; carnassial. Inhabit the Polar Seas.

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Sub-genus I.—CATODON (LACEP.) *Orifice of spiracles placed at the very end of the upper part of muzzle; no dorsal fin.*

919. 1. *P. Macrocephalus* (Great-headed Cachalot.) Lower teeth twenty to twenty-three on each side, curved, and a little pointed at the extremity; small conical teeth concealed in the upper gums; tail straight and conical; longitudinal eminence on the back, above the anus; upper part of the body blackish or slate-blue, a little spotted with white; belly whitish; forty-six to sixty feet long.

*Shaw, Gen. Zool. Cachalot Macrocephale, Lacep. Grand Cachalot, Bonnat. Cetol.*

*Icon. Encyc. Cetol. Shaw, Lacep.*

*Habitat.* North Seas. Have been found even in the Adriatic.

*Obs.* Between *Ph. Trumpo* and the above species, the Baron finds no distinction. Between *Ph. Catodon* (Svinewal) and *Macrocephalus* he considers any difference in teeth to be the result of age. *Ph. Macrocephalus* of Gmelin, which forms the Sub-genus *Physalus* of Lacepède, rests only on a bad figure of Anderson's, and is considered doubtful both by the Baron and M. Desmarest.

Sub-genus II.—PHYSETER (LACEP.) *Orifice of the spiracle situated at the end or near the end of the upper part of muzzle; a dorsal fin.*

920. 1. *Ph. Microps* (Small-eyed Cachalot.) Lower teeth twenty-one on each side, arched, the points directed backwards and a little inwards; dorsal fin large, straight, and pointed; pectoral fins broad; eyes very small; sixty-six to eighty feet long.

*Physeter dorso pinnâ longâ, &c. Artedi. Cachalot Microps, Bonnat. Physetère Microps, Lacep.*

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Icon. *Bonnaterre*.

Habitat. Northern Seas nearest the pole.

921. 2. *Ph. Sulcatus* (Furrowed Cachalot.) Teeth of lower jaw pointed and straight; inclined furrows on each side of this jaw; dorsal fin conical, situated above the pectorals, which it equals in length; dimensions unknown.

*Physeter Sulcatus*, *Lacep. Mem. du Mus.*

Icon. —

Habitat. Seas of Japan, and perhaps the North Pacific.

*Obs.* Taken from a Chinese figure, communicated to M. *Lacepède* by M. *Abel Remusat*.

*Orthodon* and *Mular* are not separated by the Baron from *Microps*.

Genus II.—BALÆNA, Linn.

Teeth none; upper jaw keel-formed, furnished on each side with whalebones or transverse corneous laminæ, slender, serrated, and attenuated at the edges; orifices of the spiracles separated, and situate towards the middle of the upper portion of the head; a dorsal fin in some species, nodosities on the back in others; short cæcum; feeds on small fish and mollusca, &c.; inhabits the Northern Seas, but some species frequent the temperate zones.

Sub-genus I.—BALÆNA, *Lacep. No dorsal fin.*

922. 1. *B. Mysticetus* (Common Whale.) Body thick and short; tail short; no boss on the back; upper jaw furnished with about seven hundred transverse laminæ or whalebones; eighty to one hundred feet long.

*Balæna Major*, *Sibbald. Balæna Vulg. Gröenlandica, Briss., Oth. Fabricus. Balæna Mysticetus, Linn., Erx., Gm. Baleine Franche, Bonnat. Lacep.*

Icon. *Ency. Cet. Lacep.*

Habitat. Atlantic Ocean and Polar Seas in the neighbourhood of Gröenland.

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923. 2. *B. Glacialis* (Nord-Caper.) Lower jaw rounded; high and broad body, and tail elongated; no boss on the back; general colour gray, more or less clear; under the head a vast oval surface of a shining white, with a few blackish spots; dimensions unknown.

Balæna Islandica, *Briss.* *B. Glacialis*, *Klein.* Nord-Caper, *Anderson.* Baleine Nord-Caper, *Bonnat.* *B. Mysticetus*, *Var. B. Gm.* Baleine Nord-Caper, *Lacep.*

Icon. *Lacep.*

Habitat. North Atlantic, between Spitzbergen, Norway, and Iceland.

924. 3. *B. Nodosa* (Knotted Whale.) A boss on the back, situate near the tail; pectoral fins white, long, and remote from the end of the muzzle.

Pflokfish, *Anderson, Crantz, Dudley.* *B. Gibbosa*, *Var. B. Gm.* Baleine Tampon, *Bonnat.* Baleine Noeuse, *Lacep.*

Icon. —

Habitat. The coasts of New England.

925. 4. *B. Gibbosa* (Bossed Whale.) Five or six bosses on the back, near the tail; whalebones white.

Knoten fisch, *Anderson, Balæna Mæra, Klein?* Baleine, à six bosses, *Briss., Crantz., Muller.* Baleine à bosses, *Bonnat.* Baleine Bossue, *Lacep.*

Icon.—

Habitat. Sea of New England.

*Obs. B. Japonica* and *B. Lunulata*, are considered doubtful by M. Desmarest, resting only on Chinese sketches, communicated to M. Lacepède by M. Abel Remusat.

Sub-genus II.—BALENOPTERA, (*Lacep.*) *Whalebones; a dorsal fin.*

926. 1. *B. Gibbar* (The Gibbar.) Jaws pointed and

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equally advanced; whalebones short; no folds under the throat or belly; whalebones bluish; body brown above and white underneath; as long as the Common Whale.

Fin-Fisch, *Martens*. Baleine Gibbar, *Rondelet*. Balæna Tripinni Ventre lævi, *Briss*. Balæna Physalus, *Linn.*, *Erx.*, *Gm.* Gibbar, *Bonnat*. Baleinoptère Gibbar, *Lacep*.

Icon. *Encyc. Cet. Martens*, *Lacep*.

Habitat. The Arctic Icy Sea, also the North Atlantic.

927. 2. *Bal. Boops* (Jubarta.) Nape elevated and round; muzzle advanced and a little rounded; longitudinal folds under the throat and belly; tuberosities almost demispherical in front of the spiracles; dorsal fin curved behind; fifty-four feet long.

Jubartes, *Klein*. Jupiter-Fisch, *Anderson*, Baleine à Museau Pointu, *Briss*. Bal. Boops, *Lin.*, *Erx.*, *Gm.* Baleinoptère Jubarte, *Lacep*.

Icon. *Encyc. Cet. Lacepède*.

Habitat. Seas of Groënland, but occasionally found in many seas in both hemispheres.

*Obs.* The *Balæna Musculus*, is not sufficiently distinguished. *B. Rostrata* of Hunter, Fabricius, and Bonnaterre, the Baron thinks differs only in dimensions from the Jubarta. *B. Rostrata* of Pennant is the Hyperoodon. *B. Punctata*, *B. Nigra*, *B. Cærulescens*, and *B. Maculata*, depend only on the Chinese sketches before mentioned, of M. A. Remusat, and are marked doubtful by M. Desmarest.

END OF THE SYNOPSIS OF THE MAMMALIA.

*Principal Errata in the Synopsis of Ruminantia.*

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<i>Page</i>	<i>Line</i>		<i>read</i>	
298	21	for Roguere . . .		Kirguise
	25	„ slightly turned . . .	„	tumid.
299	16	„ less turned . . .	„	tumid
	22	„ Pennich-cat . . .	„	Pennich-Catl.
310	3	„ probably these . . .	„	probably this
315	8	„ coloured ; triangle . . .	„	coloured triangle
318	15	„ Honduras . . .	„	Honduras.
321	9	„ prolonged with . . .	„	with prolonged

# THE FOSSIL REMAINS OF VERTEBRATED ANIMALS.

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By EDWARD PIDGEON, Esq.

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## FOSSIL MAMMALIA.

RESEARCHES into Fossil Osteology are comparatively of very recent date, and almost all that they possess of a scientific form is owing to the exertions of the illustrious naturalist whose steps we have thus far pursued, though at a very humble distance. It was reserved for him to ascertain, for the most part, the genera and species to which the osseous remains of terrestrial animals, so abundantly discovered in the superficial strata of this planet, are attached. Prepared for the execution of this Herculean task by the profoundest study of comparative anatomy, and the natural history of existing, he was enabled to characterize with precision the fragments of extinct species, to reconstruct those ancient animals, and present to our astonished view the wonders of former creations. More certain data have been thus obtained for the revolutions and duration of the globe; geology has ceased to be a romance, and a solid basis is at length established for a rational theory of the earth. Our intention is to present to our readers, in an abridged form, the result of such researches, not only of the Baron, but of every other modern naturalist who has investigated the subject; but, before we enter on any specific details, it will be necessary to take a brief general view of the revolutions which the surface of this globe has undergone, and the consequent alterations which have taken place in animal existence. Our limits will

prevent us from entering very deeply into the purely geological portion of the subject, or, in fact, of considering it at all, except in relation to its connection with the organic fossils.

An inspection of the various strata in which fossil remains have been deposited, serves to prove that, in general, a constant order has been observed in their formation.

The sea, by which the entire earth appears to have been covered, having rested in certain situations a sufficient length of time to collect particular substances, and sustain the life of certain genera and species of animals, has been afterwards replaced by another sea, which has collected other substances, and nourished other animals.

It may be believed that the primitive strata, which contain no organic remains, had all of them one contemporaneous origin. But, with respect to the strata which cover them, the study of fossil osteology has clearly proved that they were formed at different eras of time, during each of which animals existed distinct from those which lived in other eras, and distinct from almost all the known species which exist at the present day. It is true, that those causes to which the production of mountains is owing, have, in the countries which are intersected by primitive chains, or which border on them, disturbed the original established order of the strata. But, in level countries, it is perfectly obvious that they have been formed by a long and tranquil sojournment of the waters, in the same manner as are formed, at the present day, those depositions which cover the bottom of the seas.

Vegetable and animal remains are sometimes found at a depth of three or four thousand feet, and even below the sea, as in the instance of the coal-pits of Whitehaven. In all parts of the world, marine productions are to be found in a fossil state. They are found at very considerable degrees of elevation, on mountains far remote from the neighbourhood of any sea. So numerous, indeed, are they in certain places, that they constitute, to a very great extent, the aggregate of

the soil. These remains of organized bodies were formerly considered as mere *lusus naturæ*, generated in the bosom of the earth by its creative powers. But this absurdity has been completely refuted, by a thorough examination of their forms and composition. It has been clearly demonstrated that there is no difference of texture between the bodies of which we now speak, and those which exist in our present seas.

The marine genera, found in the most ancient, do not appear to be as numerous as those contained in the more recent strata; and it is worthy of remark that the fossil organic bodies of every description, differ more from existing species in proportion to the antiquity of the strata in which they are found. Those very ancient formations, to which the name of *transition-strata* has been given, rest upon the granite or other primitive rocks, which, as far as we can tell, form the substratum of the globe, and in which no organic remains have ever been discovered. We are thus led to the knowledge of a fact equally astonishing and certain, namely, that there was a period when life did not exist upon this earth; the era, indeed, of its commencement is clearly observable. This evidently proves the doctrine of a creation, and utterly confounds the absurd speculations of atheism respecting the eternity of the world, and the generative powers of inanimate matter.

The mode in which these primitive strata were formed is a mooted question. Some are of opinion that the ancient granite owed its origin to a fluid which once held every thing in solution, and others, that it was the first substance that became fixed, on the cooling of a mass of matter in a state of fusion. The Marquess de La Place has conjectured, that the materials of which the earth is composed were at first of an elastic form, and became, in cooling, of a liquid, and, finally, of a solid consistence. The recent experiments of M. Mitcherlich, says the Baron Cuvier, go far in support of this opinion. That gentleman has completely succeeded in composing and crystallizing several of the mineral species which enter into the composition

of primitive rocks. Be this, however, as it may, we find the shelvy summits of all the grand mountain-chains which intersect our continents composed of these primitive strata. The granite almost invariably constitutes the central ridges of these mighty chains, and, singular to relate, it occupies the highest and the lowest position in their stratification. That it was forced upwards by some tremendous convulsions of nature, which have shaken this globe to its very centre, is indubitable. The indented ridges, the ragged precipices, the bristling peaks, by which these primitive chains are always characterized, prove to demonstration the violence which was exerted in their production. In this respect, they exhibit a decided contrast to those more convex mountains, and undulating ranges of hills, whose mass was quietly deposited by the last retiring sea, and has since remained undisturbed by any violent revolution.

The lateral ridges of these chains are formed of schistus, porphyry, talc-rocks, &c. which rest on the sides of the granite. Finally, the external ranges are composed of granular marble, and other calcareous strata, but devoid of shells, which rest upon the schistus, and form the last boundary of the empire of mere inanimate matter. We now begin to find, but few in number, and, at intervals, in the transition strata, the earliest animal productions. We find the larger orthoceræ, those singular crustacea, the tribolites, the calymenes, the ogygiæ. We find encrinites, numerous species of *cornua ammonis*, and of *terebratulæ*, *belemnites*, *trigoniæ*, and other genera, most of which are no longer found in less ancient strata. *Terebratulæ* are found in these ancient strata, in the chalk formations above them, in the shelly limestone above those, and in the living state; but the number of species, and even of individuals of this genus, are found to diminish in an inverse ratio to the antiquity of the periods in which they existed.

We find shelly strata occasionally interposed between beds of granite and other primitive substances, which must have occupied their present situation at a more recent period. That

these primitive masses experienced changes and convulsions even previously to the appearance of life on this globe is evident. These masses indicate violent removals of position, some of which must have taken place before they were covered by the strata of shells. The disruptions we observe among them are sufficient proof of this. But since the formation of the secondary strata those same primitive masses have undergone similar convulsions. They have, not improbably, caused, most certainly they have shared in, the violent changes which have as evidently taken place in the secondary strata. How, if it were otherwise, could it happen that we find immense portions of those primitive rocks uncovered, though not situated so high as the secondary strata? We find numerous blocks of granite, &c. scattered over the secondary strata, even in situations where deep vallies, where portions of the sea intervene between them and those mountainous ridges from which they must have been transported. They must have been driven thither by tremendous eruptions or violent inundations, far exceeding in force and velocity any impelling cause with which we are now acquainted capable of changing the face of nature.

To enter very deeply into an examination of the acting causes which contribute at present, and have contributed ever since the era at which authentic history dates its commencement, to change the earth's surface, would be foreign to our present purpose. It will be sufficient to remark that these causes are rains and thaws, which bring down portions of mountains; streams which carry these on, and form what are termed alluvial depositions, in places where their course is slackened; the sea, which gradually changes the outline of the land, by undermining the more elevated coasts and forming precipitous cliffs, and throwing in heaps of sand upon the more level shores, thus gradually overspreading a considerable extent of terra firma; and finally, volcanoes, piercing through the solid strata and throwing heaps of matter around them to certain degrees of extent and elevation.

Now, the action of the waters, whether in rains, thaws, or running streams, which extend the land by the eventual deposition of debris, presupposes the existence of mountains, vallies, plains, and other inequalities, and consequently could not have produced them. The action of the sea is still more limited, and its phenomena have no affinity with the immense masses of whose revolutions we have been speaking; and volcanoes, though they have formed both mountains and islands, formed them of nothing but lava, i. e. of substances modified by volcanic action, which is never the case with the substances to which we have above alluded, nor do volcanoes ever disturb the strata which traverse their apertures. In a word, none of the agents acting on the earth's surface with which we are now acquainted, are capable of producing those tremendous revolutions which have left their traces so indelibly marked on the external covering of the globe. Neither will the circular motion of the pole of the earth, nor the gradual inclination of its axis on the plane of the ecliptic, better serve to explain such phenomena. The slowness and limited direction of these motions bear no proportion to the extent and overwhelming rapidity of such catastrophes. It follows, then, that they must have been occasioned by causes whose operation has long ceased, which were external to this planet, and most probably totally out of the course of things in existing nature. Many conjectures have been made by naturalists respecting the character of these causes, some eminent for absurdity, and all resting on hypothesis; into any of which it would be as wide of our design to enter as to propound any new solution of our own. It is enough to repeat that nothing in the agency of nature, as it has operated for ages in relation to this earth, could have produced the grand revolutions which this earth has evidently undergone; nor is it any absurdity to suppose that the agency which did produce them was preternatural.

To return to our more immediate subject; it is comparatively but a short time since the study of marine fossils has been

pursued with that degree of attention which it deserves. Involving infinitely greater difficulties than that of the conchology of existing species, much fewer of the former than of the latter have been discovered. It is yet the opinion of some eminent naturalists that the number of ancient species may equal, if not exceed, that of the modern. They are led to this conclusion by considering that the latter appertain but to a single era, while the former are attached to many successive periods in which animals of different descriptions have been abundantly produced.

It is but seldom that we meet with shells in the fossil state of species perfectly analogous to those which now exist. There is scarcely any exception to this but in the case of the fossils imbedded in the low hills of the Apennine range, of which a considerable number are found in a living state in the neighbouring Mediterranean. It is, however, remarkable that a number of mollusca and marine polypi found in this sea in abundance are not discovered in the fossil state, as, in like manner, fossil species are found in the Apennines that no longer exist. This want of perfect similarity is by no means surprising when we find that even species of the same strata, and of the existing seas, do not perfectly resemble when the habitat differs.

The remains of mollusca and zoophytes are much more numerous than other fossils, and the strata in which they are found are sometimes changed into calcareous stone. They are found in falun, in marl, in clay, and in grès or granulated brownish quartz. Shells, nearly resembling those of our marshes and streams, are found in the more recent strata.

Between the strata composed of marine fossils, we sometimes meet others containing terrestrial remains of animals or vegetables, which prove the settlement and return, at different periods, of the sea and fresh water, and even between these periods, the absence for a time of both, as it appears that the

terrestrial animals must have lived in the place where their remains are found.

The circumstance of finding, amidst the ice of the north, the carcasses of elephants and rhinoceroses with flesh and hair, proves that the retreat of the waters at the era of their destruction must have been prompt. A sudden change must have also taken place in the temperature of these countries; for these carcasses were found in places to which they could not have been transported at the present day, and were besides so frozen up, that in the instance of the elephant found by a Tungoose in 1799 (as will be subsequently seen), several years elapsed before all the parts of the body could be extricated.

Had the waters retired slowly, the entire surface of the earth so abandoned would have been like the shore of the sea; ancient cliffs would have been found wherever elevations existed, and the fossil shells would have been defaced like those now found on the sea-coast. But nothing of all this occurs. Many fossil shells are found broken, but not worn: their angular points are not blunted. This is declared by M. DeFrance to be invariably the case with those of France, Italy, England, and North America, which he has examined, with the exception of such as are found in the falun of Touraine, which in all respects resembles the shelly sand of the sea-shore. The shells found there are almost all broken; their angles are blunted, and in the apertures of the univalves stones or other shells are repeatedly found which are difficult to be got out, just exactly as we find it to be with those on the sea-coasts. Terrestrial helices are even found there of a species unknown in the country filled with the debris of marine polypi and shells. It is natural to imagine that the soil of Touraine where the falun is found was exposed to the dashing of the waves which covered those parts of France where the bed of coarse, shelly limestone is found, and with which the falun of Touraine has the strongest affinity.

Fossil fish are found in the ancient marine strata as well as in the more recent. So are the crustacea which frequently accompany them. There is reason to believe, that a sudden revolution like that which a volcano might occasion, may have overwhelmed such of them as are found in the greatest abundance in certain places. The debris of osseous fishes are often found: but of the cartilaginous we find nothing but the vertebræ and teeth of squali. The coarse, shelly limestone, as well as the more recent strata, contains an immense quantity of debris of the claws of crustacea, and of the auricular bones of different sorts of fish.

The remains of terrestrial animals found in the fossil state consist of bones, the antlers of certain species of cervus, and teeth. It may be noticed, that such remains are rarely in a state of petrification. The horns of other ruminants, hoofs, claws, &c. are never found.

Oviparous quadrupeds, such as the crocodiles of Honfleur, of England, and the monitors of Thuringia, are found in very ancient strata. The saurians and tortoises of Maestricht are met with in the more recent chalk formation. The bones of lamantins and phocæ are found in a coarse, shelly limestone, very analogous to that which covers the chalk formation near Paris. The Baron has observed, in his great work, that up to this point no remains of mammiferous land animals have been found. Professor Buckland, however, to whose researches fossil osteology is so much indebted, has, in the first volume of the "Transactions of the Geological Society," given an account of a mammiferous quadruped occurring in an ancient secondary rock. In the calcareous slate of Stonesfield, in Oxfordshire, which lies in the upper part of the lowest division of oolitic rocks, have been found, says the Doctor, "two portions of the jaw of the didelphis, or opossum, being of the size of a small kangaroo rat, and belonging to a family which now exists chiefly in America, Southern Asia, and New Holland." The Doctor refers this fossil to didelphis on the

authority of the Baron himself, who has examined it twice, and the second time pronounced it to have been mammiferous, like an opossum, but of an extinct genus, and differing from all carnivorous mammalia in having ten teeth in a series in the lower jaw.

It is right, however, to remark here, that some controversy has arisen respecting the exact position of this calcareous slate in the minor subdivisions of the oolitic series at Stonesfield. To enter into the merits of this controversy would be quite beside our purpose; and, though we most strongly lean to the belief that the Doctor is justified in his conclusions, it would be presumptuous in humble compilers like ourselves, to pronounce decisively on so important a question.

Waiving this exception, if it be one, we find no bones of terrestrial mammalia until we come to the strata deposited above the last-mentioned formation of shelly limestone. There we first discover them, and there is a remarkable succession among the species. The debris of genera unknown at the present day, of anoplotheria, of paleotheria, found in the fresh-water formation, are the first which exhibit themselves above the shelly limestone. With those we find some lost species of known genera, oviparous quadrupeds and fishes. The beds in which they are found are covered by other strata, filled with marine fossils.

The fossil elephant, the rhinoceros, the hippopotamus, and the mastodon, are not found with those more ancient genera. They are found in the ancient alluvial strata, sometimes with marine and sometimes with fresh-water productions; but never in the regular rocky strata. The species of these animals, and every relic found with them, are either unknown or doubtful: and it is only in the latest alluvial depositions that species which appear similar to those now existing are to be found.

Among the most astonishing phenomena which fossil osteology unfolds to our view, are those *osseous breccie*, which, though removed from each other the distance of many hundred

leagues, do yet present analogous peculiarities. Scattered rocks composed of the same stone are divided in different directions. Their fissures are filled with a calcareous concretion, very hard, and forming a sort of red ochreous cement, in which bones mixed with terrestrial shells are found imbedded. These bones, which are not petrified, have been almost all of them broken previously to their incrustation. These breccie are found in the rock of Gibraltar, at Cette, Nice, Antibes, in Corsica, in Dalmatia, and in the island of Cerigo; depositions nearly similar are found at Corcud, near Terruel in Arragon, in the Vicentine territory, and in the Veronese.

In the rock of Gibraltar have been found the bones of a ruminant animal, which the Baron thinks may appertain to antelope, and the teeth of one species of the genus *Iepus*.

In the deposition at Cette, the bones of rabbits, of the size and form of such as now exist, have been found; others of the same genus, but one-third smaller; rodentia, similar to the campagnol; birds of the size of the wagtail, and snakes.

In the osseous breccia of Nice and Antibes are found the bones of horses, and ruminants' teeth of the latter order, of species about the magnitude of *cervus*.

The breccia of Corsica contains debris of *lagomys*, existing at present only in Siberia, and bones of a rodens resembling perfectly the water-rat, except that it is smaller.

We find in those of Dalmatia, the bones of ruminants of the size of *dama*.

Of the bones in the breccia of the island of Cerigo, we have no account, except from Spallanzani, who imagined that human bones existed among them. This opinion, however, appears totally destitute of foundation.

In the deposition of Corcud, the bones of asses and oxen have been found, resembling those of the present day, and of sheep of a very diminutive size.

In the Vicentine and the Veronese breccia, the antlers and bones of *cervus* have been found, together with the bones of

oxen and elephants. A tusk of one of these last was nearly twelve feet in length.

Similar discoveries have also been made in the fissures of Sicily and Sardinia, and in different parts of Germany. But it is impossible to afford in this place any further detail concerning them.

In the plaster-quarries in the neighbourhood of Paris, are found skeletons of genera for ages extinct, such as the anoplotherium and palæotherium: also bones of an animal bearing affinity to the sarigue, of four species of carnivora, with debris of tortoises, birds, and fishes.

The loose strata exhibit bones, teeth, and tusks of elephants, mingled with bones of horses, in almost every country; of mastodons, in America, in Little Tartary, in Siberia, in Italy, in France; of the rhinoceros, in France, in England, in Italy, in Germany, and Siberia; of the hippopotamus, near Montpellier, in Italy, and England, &c. &c. of an animal resembling the tapir in the south of France; of a gigantic species of cervus, resembling the elk in Ireland and England; of the Indian musk-ox in Siberia; of fallow-deer of an unknown species in Scania; of hyænas, near Eichstadt; of balænae, in the Plaisantin; and of an immense animal of the family tardigrada, called the megatherium, a species unknown in the living state, near Buenos Ayres.

In the *turbaries* of the department of the Somme in France, have been found debris of the aurochs, of oxen, far surpassing in magnitude our domestic races; of beavers, of cervi of unknown species, of horses, of roebucks, and of wild boars.

We are far, indeed, from having enumerated all the discoveries of this description that have been made, nor will our limits permit us to do so. Even since the publication of the last edition of the "*Ossemens Fossiles*," thirty species have been found in volcanic tufa in the strata of Mount Perrier, near the Issoire, in France;—namely, nine ruminants, six pachydermata, one edentatum, twelve carnivora, and two ro-

dentia. In the calcareous fresh-water formation of Volvic, ten species;—one ruminant, two anoplotheria, one palæotherium, two rodentia, two carnivora, and two reptiles. In the similar formation of Gergovia, four species;—one anoplotherium, one reptile, and two ornitholites. Nay, even as we write, these discoveries are being prosecuted on the Continent and in America, with a zeal, assiduity, and success, unexampled in any former era in the annals of science; nor can it be expected, by any possibility, that a sketch like the present should embrace them all.

Phenomena not less astonishing than those on which we have been hitherto commenting, are exhibited in certain ancient caverns which have been discovered in Germany, in Hungary, and in England. They equally surprise and interest us by the immense quantity of debris of fossil animals which they contain, and the remarkable analogy that exists among them all in a geological point of view. To attempt any thing even approaching to a complete account of them here would be impossible. We shall, however, notice some of their most striking peculiarities; and for a fuller description refer our readers to the “*Reliquiæ Diluvianæ*” of Professor Buckland, a work equally admirable for deep research, luminous exposition of facts, and sound deduction.

The most anciently celebrated of these caverns, according to the Baron, is that of Bauman, near the city of Brunswick. The entrance faces the north, but the entire direction is from east to west. The entrance is very narrow. The first chamber is the largest. Into the second it is necessary to descend by a passage, first creeping, and then with the assistance of a ladder. The difference of level is thirty feet. This second chamber most abounds in stalactite, of a variety of forms. The passage to the third chamber is at first the most difficult of all. It is necessary to climb with hands and feet, but it gradually enlarges, and the stalactites upon its roof and sides exhibit an astonishing variety of fantastic and beautiful figures. There

are in this passage two lateral dilatations, constituting a third and fourth chamber in the map of the *Acta Erud*: At its extremity it is necessary again to re-ascend to arrive at the entrance of the third chamber, which forms a sort of portico. Behrens, in his *Hercynia Curiosa*, says that there is no penetrating there, as it would be necessary to descend more than sixty feet. But the map above-mentioned and the description of Van der Hardt which accompanies it, characterize this third chamber as the fifth, and place beyond it another tunnel or passage terminated by two small caverns. Silbersschlag, in his *Geogenie*, adds that one of them leads into a final tunnel, which, descending considerably, leads under the other chambers, and is terminated by a place filled with water. There are abundance of fossil remains in this remote and unfrequented part.

The principal portion of the bones discovered in this cavern belong to the genus of the bear.

Other caverns very nearly similar are found in the chain of the Hartz mountains. Many are also found in Hungary on the southern declivities of the Krapach mountains. But the most celebrated of all is that of Gaylenreuth, situated on the left bank of the Wiesent. It is composed of six grottoes, which form an extent of more than two hundred feet. These caverns are strewed with bones, great and small, which are all of the same description as are to be found over an extent of more than two hundred leagues. More than three-fourths of these bones belong to a species of bear as large as our horses, and which is longer found in the living state. The half or two-thirds of the remaining bones belong to an hyena, of the size of the living bear. There were also the remains of a tiger, wolf, fox, glutton, and pole-cat, or some species approximating to it. The bones of herbivora are also found there, particularly of cervi, but in smaller number. Soemmering has also mentioned that a portion of the cranium of an elephant was extracted from this cavern.

It is the opinion of the Baron that the remains in question belonged to animals which lived and died in the caves in which their debris are found, and that the period of their establishment there was considerably posterior to the era in which the extensive rocky strata were formed. In his first edition, he expressed his opinion that it was subsequent to the formation of the loose strata in which the bones of the elephant, rhinoceros, and hippopotamus have been discovered. But he has since altered this opinion, and fully coincides with Dr. Buckland that the bones of the caverns and the osseous breccia, are of the same antiquity with those of the loose strata, and that all were prior to the last general catastrophe which overwhelmed this globe.

Of the *Megalonix*, an extinct animal of the sloth genus, the remains have been found in a cavern in Western Virginia.

Of the caves of this country the most remarkable is that of Kirkdale, in Yorkshire, visited and first described by Dr. Buckland. The generality of educated readers must be so well acquainted, through the medium of various publications, with the researches of the learned professor, that we shall be excused from following him through his very minute and lucid description of the geological position and internal peculiarities of this cavern: for our present purpose it will be sufficient to observe, that the teeth and bones discovered in the cave of Kirkdale are referable to twenty-three different species of animals;—six carnivora, four pachydermata, four ruminantia, four rodentia, and five birds. Among the carnivora, the most numerous by far appear to have been hyænas of a larger size than any known at present. Their teeth were so very abundant, that the professor does not calculate the number of animals to which they belonged at less than two or three hundred. Two large canine teeth of the tiger were found four inches in length, and a few molars exceeding in size those of the largest lion or Bengal tiger. There was one tusk of a bear, which appears to have been specifically identical with the *ursus spelæus* of the Ger-

manic caves, and which, as we have already observed, equalled the horse in magnitude. The bones of the elephant, rhinoceros, and hippopotamus were found co-extensively with all the rest, even in the inmost and smallest recesses. The teeth of deer of two or three species are also numerous, but the most abundant of all are those of the water-rat.

The conclusion of the professor respecting this cave is, that it was inhabited during a long succession of years previous to the last general deluge, by hyænas, and that they dragged into it the other animal bodies whose remains are found there. The bones are all comminuted and broken; and many of them distinctly bear the impress of the canine fangs of the hyæna, an animal whose appetite for bones and tremendous power in fracturing them is well known. The professor considers, that, at the period of the last general inundation, the floor of the cave was covered with the diluvial loam and pebbles under which these bones were found, and had been so long preserved from decomposition by this covering of mud, and the coating of stalagmite above it. Several other caverns and fissures have been discovered in this country and in Wales, containing osseous remains, the greater portion of which are referable to the antediluvian era. Near Wirksworth, in Derbyshire, in a cave called Dream Cave, was found the skeleton of a rhinoceros, nearly entire. At Oreston, near Plymouth, three deposits were found of a similar nature, containing great quantities of bones. In the cave of Paviland, in Glamorganshire, were found remains of elephant, rhinoceros, horse, hog, bear, hyæna, &c. In this cave, a human skeleton was also found; but its circumstances, position, state of preservation, &c., prove it to be most clearly postdiluvian.

From all the facts of this description which have been ascertained, Dr. Buckland concludes, that previously to the last general catastrophe, the extinct species of the hyæna, tiger, bear, elephant, rhinoceros and hippopotamus, as also wolves, foxes, oxen, deer, horses, and other animals not distinguishable

from existing species, existed contemporaneously in this country; and the Baron, from similar inductions, has drawn a similar conclusion respecting the continent of Europe.

The general circumstances of all these caverns are, as we have observed, extremely similar. The hills in which they are excavated resemble each other in their composition. They are all calcareous, and produce stalactite in abundance. The roofs, sides, and passages in the caverns are ornamented and contracted by it in all its boundless variety of configuration. The bones are nearly in a similar state in all these deposits. Detached, scattered, partly broken, but never rolled, as would be the case had they been brought from a distance by the force of inundations. Somewhat specifically lighter, and less solid than the recent bones, they yet preserve their genuine animal nature, are not much decomposed, still contain plenty of gelatine, and are never in a state of petrification. A hardened earth, but still liable to break or pulverize, impregnated with animal matter, and sometimes of a blackish colour, constitutes their natural envelope. This is, in many instances, interpenetrated and covered by a crust of stalactite of the finest alabaster. The bones themselves are sometimes clothed with the same material which enters their natural cavities, and occasionally attaches them to the walls of the cavern. From the admixture of animal matter, this stalactite often exhibits a reddish hue. At other times its surface is tinted with black. But these are accidents of recent occurrence, and independent of the cause which introduced the bones into their present *locale*. It is easy to observe, that this same stalactite is daily making a rapid progress, and invading those groups of osseous remains which it had hitherto left untouched.

This mass of earth, intermixed with animal matter, envelopes without distinction the bones of all the species, and if we except a few on the surface of the soil, and which, from their comparative freshness, we must conclude to have been transported thither at a much later era, all were evidently

interred in the same manner, and by the same agents. In a great many of these caverns, especially in that of Gaylenreuth, are found pieces of bluish marble, the angles of which are rounded and blunted, clearly testifying the influence of that diluvial action which hurried them along. A similar phenomenon is observable in the osseous breccia of Gibraltar and Dalmatia.

The pachydermatous remains, so common in the loose or ancient alluvial strata, are very rarely found among the fossil carnivora of the Germanic caves: nor are the bones of the latter very frequent in the alluvial strata. This circumstance, at first, led M. Cuvier to assign different eras to those respective remains. But, independently of the fact that the reverse is sometimes the case in these situations, the discoveries made in our British caves have clearly demonstrated the contemporaneous existence of the animals in question; and the Baron, with that single-minded devotion to the cause of science invariably characteristic of the highest order of philosophical genius, has subsequently avowed that this important fact has been completely established by Dr. Buckland.

There are but three imaginable causes by which such quantities of bones could have been accumulated in those vast subterraneous repositories. Either they are the remains of animals which lived and died there undisturbed, or they were carried thither by inundations, or some other violent cause, or they were originally enveloped in the stony strata whose dissolution produced those excavations, and were not dissolved by the agent which removed the material of the excavated strata. The last supposition is refuted by the fact of these same strata containing no bones; and the second, by the integrity of their smallest prominences, which will not permit us to suppose that they have been rolled, or have suffered any violent change of place. Some of these bones, indeed, are a little worn, but, as Dr. Buckland remarks, on one side alone; which only proves that some transient current has passed over them in the de-

posit where they are found. The first supposition, then, which, as we observed, the Professor adopted in explanation of the phenomena of Kirkdale-cave, is the only one that can be admitted in reference to all the rest which exhibit phenomena precisely similar. There are certainly some cases of caverns in which we may otherwise account for the presence of bones. Animals may have retired there to die, fallen accidentally into their fissures, or been washed in by diluvial waters. But such hypotheses will only explain the cases where the bones are few and not gnawed, the caverns large, and their fissures extending upwards. In all other instances we can only account for the vast accumulation of bones by the agency of beasts of prey.

It is, however, quite certain that the period in which the animals lived in these caves was considerably subsequent, not only to the formation of the extended rocky strata of which the mountains where they are excavated are composed, but to that of similar strata of more recent date. No permanent inundation penetrated into these subterraneous recesses, or formed there any regular stony deposition. The rolled pebbles that are found there, and any traces of detrition on the bones, indicate nothing but the transitory passage of evanescent waters.

“How, then,” exclaims the Baron, “have the ferocious beings which once peopled our ancient forests, been extirpated from the surface of the earth? The only reply that can be given is, that they were destroyed at the same time, and by the same agency, as the large herbivora, which were fellow-inhabitants with themselves, and of which no traces in existing nature are any longer to be found.”

The debris of birds have been found in the fossil state, the genera of which involve some difficulty in the determination. Of these we treat in the proper place.

The genera of fossil reptiles are well characterized; such are the tortoises, the crocodiles or saurians, the monitors, the

salamanders, the protei, the frogs, and a lizard with the wings of a bat, called pterodactylus, on which the present is no place to extend our remarks.

Insects are found in the fossil state in calcareous, foliated stones, and in amber, where they are preserved without any alteration. In Prussia, where this resinous fossil production is most usually found, the insects exhibited there are all of them foreign to the climate.

The debris of vegetable fossils are found in the ancient as well as in the recent strata; but they are more common in the latter, and even on the surface of the earth. They consist for the most part in ligneous trunks, almost always changed into silex, in kernels, seeds, and the impressions of leaves, disposed between the veins of fissile stones. Those found in the mines of pit-coal belong for the most part to the family of fern, bamboo, casuarinas, and other plants, foreign to the climate in which they are thus found. These mines, situated between the granitic or porphyritic schists, are very ancient, and contain no marine shells. It is not thus with similar mines which occur in the calcareous formation. They do not appear to be equally ancient; and instead of recognizing in them the impressions of fern, &c. we find in some of them succinum, and shells of the genus ampullaria, which appear to appertain to marine depositions. The palm-tree of different kinds has been found in many situations in the fossil state, in countries to which the particular species were not native. Near Canstadt, in the duchy of Wirtemberg, an entire forest was discovered of palm-trees in a horizontal position, each two feet in diameter. In Cologne, from Bruhl, Liblar, Kierdorf, Bruggen, and Balkhausen, as far as Watterberg, are found over many leagues of country, immense depositions of wood changed almost entirely into mould, and covered with a bed of rolled flints. from ten to twenty feet in height. This deposit, which exceeds fifty feet in thickness, also contains trunks of trees, and nuts, which exhibit a strong analogy to the *areka* which

grows in India. In the midst of quartzose sands of the most arid kind in the African deserts, and on the surface of a soil for ages under the curse of sterility, are found considerable quantities of the trunks of trees changed into silex. Buried in the peat, on a mountain in the department of the Isère, in France, fossil-wood was found not less than 2000 feet above the most elevated line where trees can grow at the present day\*.

We have now to notice a fact connected with fossil osteology of the most singular and striking kind. We find, as has been seen, quadrupeds of different genera, cetacea, birds, reptiles, fishes, insects, mollusca, and vegetables, in the fossil state. But to the present moment no human remains have been found, nor any traces of the works of man in those particular formations where these different organic fossils have been discovered. What is meant by this assertion is, that no human bones have been found in the regular strata of the surface of the globe. In turf-bogs, alluvial beds, and ancient burying-grounds, they are disinterred as abundantly as the bones of other living species. Similar remains are found in the clefts of rocks, and sometimes in caves, where stalactite is accumulated upon them; and the stage of decomposition in which they are found, and other circumstances, prove the comparative recentness of their deposition; but not a fragment of human bone has been found in such situations as can lead us to suppose that our species was contemporary with the more ancient races,—with the palæotheria, the anoplotheria, or even with the elephants and rhinoceroses of comparatively a later date. Many authors, indeed, have asserted, that debris of the human species have been found among the fossils, properly so called; but a careful examination of the facts on which

\* In speaking of fossil vegetables, we should not omit to mention the name of our countryman, Mr. Parkinson, who, in his "Organic Remains," was one of the first writers who threw considerable light on the subject of fossils in general. Though erroneous in some of his speculative notions, his work contains a summary of facts of the utmost importance to this branch of science.

such assertions were founded, have proved that these authors were utterly mistaken. We refer our readers to the preliminary discourse of the Baron to his "Ossemens Fossiles," for the most complete satisfaction on this question. The same may be asserted of all articles of human fabrication. Nothing of that description has ever been found indicating the existence of the human race at an era antecedent to the last general catastrophe of this globe, in those countries where the strata have been examined, and the fossil discoveries we are treating of been made. Yet there is nothing in the composition of human bones that should prevent their being preserved as well as any others. There is no principle of premature decomposition in their texture. They are found in ancient fields of battle equally well preserved with those of horses, whose bones we know are found abundantly in the proper fossil state. Neither can it be said that the comparative smallness of human bones has any thing to do with the question, when it is recollected, that fossil remains of some of the smallest of the rodentia are to be found in a state of preservation.

The result, then, of all our investigations serves to prove that the human race was not coeval with the fossil genera and species: for no reason can be assigned why man should have escaped from the revolutions which destroyed those other beings, nor, if he did not escape, why his remains should not be found intermingled with theirs. His bones are found occasionally in sufficient abundance in the latest and most superficial depositions of our globe, where their bones are never found: their bones are in immense quantities in some of the ancient strata of the earth, where no traces of him exist. Human remains in caverns and fissures, along with some of those more ancient debris, prove nothing for the affirmative of man's coeval existence with the lost species. Their freshness proves the lateness of their origin; their fewness, the impossibility that mankind could have been established in the adjacent regions at

the period when those other animals lived there; and their situation and general circumstances, the accident of their introduction.

It is a fact not less remarkable, that no remains of the quadrumanous races, which occupy the next rank in creation to man, at least in physical conformation, are to be found in the strata of which we have been speaking. Nor will this fact be deemed less remarkable when it is considered that the majority of the mammifera there found have their congeners at present in the warmest regions of the globe, in the intertropical climates where those anthropomorphous animals are almost exclusively located.

Where, then, was the human species during the periods in question? Where was this most perfect work of the Creator, this self-styled image of the divinity? If he existed any where, was he surrounded by such animals as now surround him, and of which no traces are discoverable among the organic fossils? Were the countries which he and they inhabited overwhelmed by some desolating inundation, at a time when his present abodes had been left dry by the retreating waters? These are questions, says the Baron, to which the study of the extraneous fossils enables us to give no reply.

It is not meant, however, to deny that man did not exist at all in the eras alluded to—he might have inhabited a limited portion of the earth, and commenced to extend his race over the rest of its surface, after the terrible convulsions which had devastated it were passed away. His ancient country, however, remains as yet undiscovered. It may, for aught we know, lie buried, and his bones along with it, under the existing ocean, and but a remnant of his race have escaped to continue the human population of the globe. All this, however probable, is but conjecture. But one thing is certain, that in a great part of Europe, Asia, and America, countries where the organic fossils have been found, man did not exist previously to the revolutions which overwhelmed these remains, nor even pre-

viously to those by which the strata containing such remains have been denudated, and which were the latest by which this earth has been convulsed.

It only remains for us now to give a summary view of the succession of strata, and an enumeration of the different fossil genera and species in the respective strata, by the order of which we are enabled to calculate to a certain extent the number of revolutions the globe has undergone. In doing this, we shall pursue the order observed by the Baron in his great work.

In speaking of the strata of which this globe is composed, we must be understood to mean here nothing more recent than that formation which is proved to have resulted from the last grand catastrophe by which the earth was overwhelmed. The strata then formed, the most superficial of the regular strata, consisting of beds of loam and argillaceous sand, mixed with rolled pebbles from remote regions, and filled with debris of land animals unknown, or foreign to the places in which they are found, appear to have covered all the plains, and the floors of the caverns, and choked up the fissures of the rocks within their reach. To such formations, Dr. Buckland has given the name of *diluvium*, and described them with his usual clearness and accuracy. They must be considered as totally distinct from the other strata, which, like them, are equally loose, but have been continually deposited, by streams and rivers, in the usual course of nature, since the last great convulsion of the globe, and which contain no fossil remains, but such as are indigenous to the country where they are found. These last depositions Dr. Buckland distinguishes by the term *alluvium*, and they must be considered as entering for nothing into the question of the grand revolutions of the earth. But in the *diluvial* strata, all modern geologists have discovered the clearest evidence of that tremendous inundation, which constituted the last general catastrophe by which the surface of our planet has been modified. It may not be amiss to inform our

readers here, that both these formations agreeing in their character of uncompactness, but differing in their antiquity, are alike termed loose, or *alluvial*, by Cuvier and other geologists. We do not altogether deviate from this usage in our subsequent account of the fossil species; but when we use the term *alluvial*, in relation to organic debris, we must be understood to mean the diluvial formations.

Between this diluvium and the chalk formation are strata alternately filled with fresh and salt water productions. These mark the irruptions and retreats of the sea to which our portion of the globe has been subjected, subsequently to the formation of the chalk. First come marly beds, and cavernose silex, similar to those of our ponds and morasses. Under these are marl again, sandstone, and limestone, containing nothing but marine productions.

At a greater depth we find fresh-water strata, of an era more remote. Among these are reckoned the celebrated plaster-quarries in the neighbourhood of Paris, where the remains of entire genera of terrestrial animals have been found, which exist no longer.

These last-mentioned strata rest on beds of calcareous stone, in which an immense number of sea-water shells have been collected, the great majority of which belong to species unknown in the existing seas. In this formation are also found the bones of fishes, cetacea, and other marine mammalia.

Under this marine limestone we have again another fresh-water stratum, composed of argilla, in which are interposed considerable beds of lignite, or that species of coal which is of a more recent origin than our pit-coal. Here are found shells only of the fresh water, and bones among them, not of mammiferous animals, but of reptiles. It is filled with crocodiles and tortoises, &c., whereas the mammiferous genera contained in the gypsum are not seen there. They did not yet exist in the country when the argilla and lignites were in a course of formation.

This last fresh-water formation, which supports all the

strata just enumerated, and appears the most ancient of the Parisian depositions, is itself supported by the chalk. This formation, of immense thickness and extent, appears in countries as remote from us as Pomerania and Poland. But in the neighbourhood of Paris, in Berri, in Champagne, in Picardy, and a considerable part of England, it predominates uninterruptedly, and forms a most extensive circle, or basin, in which all the strata we have mentioned are contained, and its edges are barely covered by them in these places where the superstrata are least elevated.

Such superstrata are not confined to the countries just instanced, or to the basin in question. Depositions, more or less similar, and containing organic remains, are found in other regions, wherever the surface of the chalk affords similar cavities for their reception. They are found even where no chalk formation exists, and where the most ancient strata constitute their only support. The two distinct formations with fresh-water shells have been found in England, Spain, and even on the confines of Poland; the marine beds interposed between them exist along the entire range of the Apennines. Some of the quadrupeds of the Parisian plaster-stones have been found elsewhere, as, for instance, in the gypæous strata of Valai, and in the molasse quarries in the South of France.

Thus it appears, that the partial revolutions which took place between the era of the chalk-formation, and that of the last great inundation, and which consisted in the alternate invasion and retreat of the sea, occurred in many countries. This globe has undergone a long series of agitations and changes, which appear to have been rapid in their operation, from the comparative slowness of the depositions they have left behind. The chalk has evidently been the production of a more tranquil and extensive sea. It contains marine productions alone, but among them the most remarkable remains of vertebrated animals, all of the fish or reptile class—tortoises and lizards of colossal size and extinguished genera.

A very considerable portion of Germany and England is composed of strata anterior to the chalk, in the hollows of which the chalk reposes, just as the intermediate strata before mentioned rests in its own cavities. Immediately under the chalk, and indeed partially intermingled in its lowest strata, are depositions of green sand, and ferruginous sand below it. In many countries both are found condensed into banks of sandstone, in which are seen lignites, succinum, and debris of reptiles.

After these come the immense accumulation of strata composing the mountain-chain of Jura, which extends into Suabia and Franconia, the chief summits of the Apennines, and many similar formations in England and France. They consist in calcareous schistus, abounding in fish and crustacea, immense banks of oolite, marly and pyriteous grey limestone, containing ammonites, oysters with curved valves, and reptiles of more extraordinary character and conformation than any of their predecessors.

These, which we shall take leave to call *Jurassic* strata, are supported by extensive beds of sand and sandstone, in which the impressions of vegetables are frequently found, and which rest upon a limestone which has been termed *coquillaceous*, from the immense quantities of shells and zoophytes with which it abounds. It is separated by other strata of sandstone of the variegated kind, from a limestone still more ancient, called *Alpine*, because it composes the loftier range of the Tyrol Alps; but, in fact, it appears also continually in the east of France, and the entire south of Germany.

In the limestone called *coquillaceous*, are deposited considerable accumulations of gypsum and rich beds of salt. Below it we find slender strata of coppery schistus, with abundant remains of fish, and some fresh-water reptiles. The coppery schistus rests upon a red sandstone, of the same age as the pit-coal, which we have before alluded to as bearing the impressions of the earliest vegetable productions which adorned the surface of the globe.

We now come rapidly to the transition strata, where matter lifeless and unorganised appears to have made its last stand against the vivifying and organising principle of nature. Here we find black limestone and schistus, with crustacea and shells of unknown genera, alternating with the latest of the primitive strata. We finally arrive at the most ancient formations which we are permitted to discover,—the marble, the primitive schistus, the gneiss, and the granite, the ancient foundations of the earth, and which are themselves, in all probability, the result of the united action of fire and water, after myriads of revolving ages.

Such is the exact enumeration of the series of strata which compose our globe; such is the order of facts which geology has been enabled to establish, by calling in the aid of mineralogy, and the sciences of organization, by abandoning the reveries of arbitrary hypothesis, and steadily pursuing the safer path of observation and induction.

We shall now rapidly enumerate the fossils in those various allocations, beginning with the earliest, and ending with the latest formations.

We have observed that zoophytes, mollusca, and certain crustacea, begin to appear in the transition strata. Bones and skeletons of fish may, perhaps, be also found there. But we are far from discovering, among those early formations, the remains of land animals, or any formed for the direct respiration of atmospheric air.

The great strata of pit-coal, and the trunks of palm and fern of which they bear the impression, must presuppose the existence of dry land and aerial vegetation. Yet no bones of quadrupeds are found there, not even of the oviparous species.

Their first traces are found a step higher, in the bituminous coppery schistus. There we find quadrupeds of the family of the lizards, very similar to the monitors, which are now natives of the torrid zone. Many individuals of this description are found in the mines of Thuringia in Germany, among innu-

merable fish, of a genus unknown at present, but which, from its analogy with some existing genera, appears to have inhabited the fresh water. The monitors we know to be inhabitants of the same element.

A little higher is the Alpine limestone, and on it the coquillaceous limestone, abounding in entrochi and encrini, and forming the basis of a great portion of Germany and Lorraine. It contains the osseous remains of a very large sea-tortoise, and another reptile of the lizard tribe, of very great length, and pointed muzzle.

Next come certain sandstone strata, having only vegetable impressions of the large reeds, bamboos, palms, &c. ; and then the Jurassic limestone, where the remains of the reptile class exhibit a diversity of singular conformations, and a gigantic degree of development. Its middle portion is composed of oolites and lias, or the gray limestone, containing the recurvalve oysters; and in it were found the debris of two most extraordinary genera, uniting the characters of oviparous quadrupeds, with locomotive organs, like those of the cetacea. Those are the *ichthyosaurus* and *plesiosaurus*, first discovered and determined here by our distinguished countrymen, Sir Everard Home and Mr. Conybeare. These, with their species, shall be described in the proper place. Their skeletons are in a state of high perfection, and their remains have been found extended through all the formations of lias.

In the same deposition were also found two species of the crocodile, amidst ammonites, terebratulæ, and other shells of the ancient sea. These are called by Cuvier the long-beaked and short-beaked gavial. Another crocodile was discovered in the oolite at Caen, and another in the same formation here.

The megalosaurus, a fossil reptile of prodigious size, has been discovered by Dr. Buckland in this country. Its remains appear to have been contemporaneous with the concretion of the lias, but are also dispersed abundantly in the oolite and higher sands. From the magnitude of a femur and other

bones, found in the ferruginous sandstone of Tilgate-Forest, in Sussex, the Doctor calculates that the animal in question could not have been less than from sixty to seventy feet in length. Remains of this reptile, or at least of species referrible only to this genus, have been also discovered in France and in Germany, in the calcareous slate above the oolitic beds.

In this same slate, the long-beaked crocodiles continue to abound; but the most remarkable animals there are the pterodactyls, or flying-lizards. They appear to have been sustained in the air, on the same principle as the cheiroptera: they had long jaws, armed with trenchant teeth, hooked claws, and some species, as would seem from the fragments remaining, arrived at a considerable size.

In the nearly-homogeneous limestone of the crests of Jura, a little higher than the calcareous slate are bones, but invariably of the reptile class. There are crocodiles, but more especially fresh-water tortoises, as yet not fully determined, but many of which, by their magnitude and conformation, are strongly distinguished from all known species.

Amid those innumerable reptiles, whose varied structure and colossal dimensions rival, if not surpass, the fabled monsters of poetical antiquity, we begin, as is said for the first time, to recognize the remains of some small mammalia. Jaws and bones have been discovered in England, appertaining to the families of the didelphis and insectivora, in the sesituations. But if the locale of Dr. Buckland's discovery of the opossum before mentioned be completely established, it must be granted that they appear sooner. Cuvier, however, seems to think that the rocks in which the bones in question are incrustated may owe their existence to some local recomposition, posterior to the era of the original formation of these strata; and it is most certain that, even for a period considerably subsequent, the reptile class exclusively predominate. In the ferruginous sands above the chalk in England, abundance of those already enumerated occur; and an additional reptile has been discovered there

by Mr. Mantell, of Lewes, which seems to have been herbivorous, and to have inhabited the fresh water. This is the *iguanodon*, and it is supposed to have been sixty feet long.

In the chalk, according to Cuvier, there are only reptiles, the remains of crocodiles and tortoises. In the tufa of Mount St. Pierre, near Maëstricht, which is of the chalk formation, has been found amidst marine tortoises, shells, and zoophytes, another gigantic member of the saurian family, a distinct genus, for which Mr. Conybeare has proposed the name of *mosasaurus*.

In the argilla and lignites, covering the superior portion of the chalk, the Baron declares that he has discovered nothing but crocodiles; and thinks that the lignites of Switzerland, in which are bones of the beaver and mastodon, must be assigned to a more recent era. He adds, that it was only in what the French call the *calcaire grossier*, surmounting the argilla, that he commenced to discover mammiferous remains, and that they belonged to marine mammalia. But Dr. Buckland mentions the occurrence of these in the stratum of Cuckfield, in Sussex, much anterior to the formation of which we now speak; and they are also declared to have been found in the calcareous slate of Stonesfield, and in the corn-brash limestone in Oxfordshire.

These marine mammalia are dolphins, lamantins, and morses, apparently of an unknown species. The lamantin is at present confined to the torrid zone, and the morse to the Icy Sea; still those two genera are found together in the coarse limestone, in the midst of France. This union of species, whose consimilars are now allocated in opposite zones, is by no means uncommon.

In the strata succeeding this coarse limestone, or in the ancient contemporaneous fresh-water depositions, the class of terrestrial mammifera first begins to appear in tolerable abundance. Belonging to the same age are the animal remains buried in the molasse and ancient gravel-beds in the south of France;

in the gypsum, mixed with limestone, in the environs of Paris and of Aix, and in the marly fresh-water formations, covered again with marine strata, in Alsace, Orleanais, and Berri.

These organic remains are singularly remarkable, as belonging to a variety and abundance of certain genera of pachydermata, now totally extinct, and approximating more or less in character to the tapir, rhinoceros, and camel. These genera, for whose discovery we are entirely indebted to the Baron, are the palæotherium, laphiodon, anoplotherium, antracotherium, cheropotamus, and adapis. Of these there are about forty species, all extinct, and to which there are none analogous in the living world, except two tapirs and a daman.

In the same formation with these pachydermata are some remains of carnivora, of rodentia, of birds, of crocodiles, and tortoises. Of the first, a bat (and, singular to relate, the only instance of the kind occurring in this or subsequent formations,) a fox, an animal approximating to the racoons and coatis, a peculiar species of genet, some other carnivora not so easily determined, and, most remarkable of all, a small sarigue, a genus now confined to America. There are two small rodentia of the dormouse kind, and a head of the genus squirrel. In the gypsum of Paris, bones of birds are very abundant, constituting the remains of at least ten species. The crocodiles approximate to those of the present age, and the tortoises are all of the fresh water. There are also remains of fish and shells, in great part unknown at present.

There can be no doubt that this immense animal population of what Cuvier calls the middle age of the earth, has been entirely destroyed. Wherever its debris have been discovered, there are vast superincumbent beds of marine formation, proving the invasion and long continuance of the sea in the countries inhabited by these races. Whether the countries subjected to such inundation at this era were of considerable extent or not, our present acquaintance with the strata in question does not enable us to decide. These formations, however, embrace the

gypsum or plaster-quarries of Paris, and those of Aix in Provence, and many quarries of marle-rocks and molasse in the south of France. Certain portions of the molasse of Switzerland, and the lignites of Liguria and Alsace, are referrible to the same. As for the fossil bones of England, Italy, and Germany, they belong either to an earlier or a later era,—to the ancient reptiles of the Jurassic strata and copper-slate, or to the diluvial formations of the last universal inundation.

We may, then, fairly suppose, that, at the period when these numerous pachydermata existed, there were not many fertile plains to afford pasture for their support. These plains, too, in all probability, were insulated districts, intersected by those elevated mountain-chains in which we discover no traces of those extinct animals.

In the same strata with those pachydermatous remains are found the trunks of palm, and many other relics of those magnificent vegetable productions which at present are indigenous to tropical climates alone.

The sea which covered these formations has left extensive depositions, constituting, at a moderate depth, the foundation of our present large plains. It again retired, and left open immense surfaces of soil to a new population, the debris of which abound in all the sandy and loamy strata of every region of the globe which has been subjected to examination.

To this last tranquil deposition of the sea we must refer some cetacea, very similar to the existing species. Among these an entirely new genus has been discovered, and named *ziphius* by Cuvier. It contains three species, and approximates to the cachalots and hyperoodontes.

Among the animals which lived on the surface of this deposition, when it became dry land, and whose debris now fill the loose strata of the earth, we find no palæotheria, or anoplotheria, none of the extraordinary and extinct genera contained in the gypseous formations. Still, however, the order pachydermata predominates; but in the gigantic genera of the elephant,

rhinoceros, and hippopotamus, accompanied with innumerable bones of horses, and many of the larger ruminantia. This new animal kingdom was devastated by carnivora, of the magnitude and generic characters of the lion, the tiger, and the hyæna. This population, the remains of which extend to the extremity of the north, and the borders of the Frozen ocean, has, generally speaking, nothing congeneric at present, except in the torrid zone, but in all cases a specific difference is sufficiently marked.

Among these species are the *elephas primigenius*, or mammoth of the Russians, whose remains are found from Spain to the coasts of Siberia, and throughout all North America; the mastodon, with narrow teeth, common in the temperate parts of Europe and the mountains of South America; the great mastodon, in immense abundance in North America; an hippopotamus, very common in England, Germany, France, and Italy, and a smaller species; three rhinoceroses, chiefly in Germany and England; a gigantic tapir, in Germany and France, and an apparently extinct genus, resting on a single fragment, discovered in Siberia, and called *elasmotherium* by Fischer.

The bones of the horses are not so clearly determined to belong to distinct species. Of the ruminantia several species may be pronounced distinct, particularly a stag superior in size to the elk, common in the marle and peat of England and Ireland, and whose remains have also been found in Italy, France, and Germany; among the elephantine bones of the deer and ox of the caverns, and osseous breccia, which appertain to the same era, we cannot speak so decidedly. It appears, however, pretty clearly that they were not native to the climate; and what is most singular, the bones of the rein-deer, an animal now confined to the inhospitable regions of the north, are located with the remains of the inhabitants of the tropics. We must not, however, omit to notice, that many of the positions from which the bones of ruminantia have been taken, are not sufficiently verified to warrant us in deciding that they were contemporaneous

with the larger pachydermata last mentioned. Nay, we are even justified in believing many of them to have been post-diluvian.

In the osseous breccia of the Mediterranean have been found two species of *lagomys*, a genus confined to Siberia; two of rabbit, some campagnols, and rats as small as the water-rat and the mouse; and likewise in the English caverns; also the bones of shrews and lizards.

In the sandy strata of Tuscany the teeth of a porcupine have been found; and in Russia, heads of a species of beaver, larger than any now known, and called *trongotherium*.

The remains of the edentata, above those of all other classes, indicate species of a size far superior to that of their existing congeners, and even of a magnitude altogether gigantic. Such was the *megatherium*, an animal partaking of the generic characters of the tardigrada and the armadillos, and equalling the rhinoceros in size. It has been found only in the sandy strata of North America. The *megalonyx*, found in the caverns of Virginia, and in a small island on the coast of Georgia, very much resembled the *megatherium*, but was not so large. Those two edentata were confined to America. But in Europe one appears to have existed, which, from a fragment remaining, has been considered as not less than four-and-twenty feet in length. This fragment was found in a sand-pit, in the district of Darmstadt, not far from the Rhine, among the bones of elephants, rhinoceroses, and tapirs.

In the osseous breccia are found, but very rarely, the bones of carnivora, which are, as we have seen, far more abundant in the caverns. Those of Germany are principally characterised by the remains of a very large species of bear, much surpassing any existing one in size, the *ursus spelæus*. There are two others, *ursus arctoides* and *ursus priscus*. There is the fossil hyæna, differing, in some peculiarities of the teeth and head, from the Cape hyæna; two tigers, or panthers, a wolf, fox, glutton, genet, and some other small carnivora.

The bears are not very numerous in the loose strata. The *ursus spelæus* is said, however, to be found there, in Austria and Hainault. In Tuscany there is a peculiar species, remarkable for its compressed canines, thence termed *U. Cultridens*, or *Angustidens*. Hyænas are more frequently found in such strata, with the bones of the elephant and rhinoceros.

It appears, then, that during the era of which we are now speaking, the carnivorous order was numerous and powerful. The rodentia, smaller in general, and more feeble, have not so much attracted the attention of collectors of fossil remains. Still, as we have observed, it has presented us with some unknown species in the fossil state.

We have now enumerated the principal animals whose remains are found in the accumulation of earth, sand, and loam, which cover our large plains, and fill many caverns and fissures of rocks, and have been called *diluvium*. They decidedly constitute the population which occupied our part of the world, at the era of the last great catastrophe which destroyed their races, and prepared the soil on which the animals of our own era exist. Whatever resemblances certain of their species may present to those of our days, it cannot be denied that their general character was very different, and that most of their races have been annihilated.

It is, as we before remarked, most remarkable that in all the strata, and among all the fossil remains now enumerated, no relic has been found of man or monkey. Whether these kindred orders existed at all during the periods in question, or, if they did exist, where they existed, are points which it is yet impossible to decide. But what is quite certain is, that we are now surrounded by a fourth succession of terrestrial animals, and that, after the age of the reptiles, that of the palæotheria, and that of the mammoths, mastodons, and megatheria, the age arrived in which the human species, with the aid of certain domesticated animals, has appropriated and cultivated the earth; and it is only in alluvion, in peat, in recent concretions,

in a word, in such formations as have taken place since the last general inundation of the globe, that the bones of man and of existing animals have ever been discovered. To these are referrible the human skeletons, found incrustated in *travertino*, in the island of Guadaloupe. They are accompanied with shells and madrepores of the existing and surrounding seas. The remains of oxen, deer, &c., common in the peat-formations, are in the same predicament; as are likewise the bones of man and domestic animals embedded in alluvion, in ancient burying-grounds and fields of battle. To the era of the last general catastrophe, or to those of any preceding ages, none of these remains are attributable.

The mode in which the fossil bones have been determined, depends upon a principle in comparative anatomy, which regulates the co-existence of organic forms. Every animal may be considered as a whole, all the parts of which are in strict keeping and correspondence with each other. If the animal be carnivorous, it is characterised by a certain system of dentition. The teeth are trenchant, the jaws are powerful, and their condyles peculiarly formed. But such teeth and jaws would be of little service, unless the animal were also provided with claws adapted for seizing and tearing the prey. Claws of this kind necessitate a peculiar construction of the phalanges, a facility of rotation in the fore-arm, and corresponding changes in the humerus. Every animal whose stomach is constituted to digest nothing but flesh, must have every other part of his frame in consonance with this restriction. On the other hand, it is obvious that hoofed animals must be herbivorous, as they possess no means of seizing prey. Accordingly we find that their masticating and digestive organs correspond with this peculiarity. Their teeth are supplied with flat and unequal coronals, to bruise the herbage, &c., on which they feed; and as their system of dentition is generally less complete, so their stomachs are more complicated. This is not the place to enlarge

on a subject of this kind ; it is sufficient to observe that, by the application of this principle to its utmost extent, assisted by careful observation, the skilful comparative anatomist is enabled, in general, from a single bone, or fragment of bone, to determine with accuracy the form, character, and dimensions of the animal to which it belonged. I do not pretend to say that, in every case of fossil remains, this method is infallible. Fossil fragments may sometimes be too few, too mutilated, or of parts not sufficiently influential to warrant a decided opinion. But in the vast majority of instances, the induction is quite ample enough to justify the conclusion.

It is the study of fossil osteology alone which has led to any precise notions concerning the theory of the earth. Had organic fossils been totally neglected, no one would have imagined that successive eras, and a series of different operations, had taken place in the formation of the globe. By them alone are we certified that the covering of this planet has not always been the same, as it is obvious that, before they were buried in its depths, they must have existed on its surface. We have extended, by analogy to the primitive formations, the conclusion with which the fossils have supplied us for the secondary ; and, had the strata of the earth been destitute of organic remains, it would have been impossible to maintain that their production had not been simultaneous.

It is also to the fossils, slight as our acquaintance is with them even yet, that we are indebted for the little that we know concerning the nature of the revolutions of the globe. By them we learn that certain strata have been tranquilly deposited in a fluid mass ; that the variations in the strata have corresponded with those of the fluid ; that their denudation was occasioned by the translation of this fluid ; and that this denudation has taken place more than once. Nothing of all this could have been learned with any certainty, but for the study of the organic remains.

What an immense field for reflection is opened to the mind of the philosopher, by a survey of the discoveries to which fossil osteology has conducted us ! We read, in the successive strata, the successive efforts of creative energy, from the sterile masses of primitive formation, up to the fair and fertile superficies of the globe, enriched with animal and vegetable decomposition. We find that there was a time when life did not exist on this planet ; we are enabled clearly to draw the line between inanimate and organised matter, and to perceive that the latter is the result of a distinct principle,—of something superadded to, and not inherent in, the former. We also contemplate a progressive system of organic being, graduating towards perfection through innumerable ages. We find the simplest animals in the earliest secondary formations ; as we ascend, the living structure grows more complicated—the organic development becomes more and more complete, until it terminates in man, the most perfect animal we behold. And shall we say that this march of creation has yet arrived at the farthest limit of its progress ? Are the generative powers of nature exhausted, or can the creator call no new beings from her fertile womb ? We cannot say so. Revolution has succeeded revolution—races have been successively annihilated to give place to others. Other revolutions may yet succeed, and man, the self-styled lord of the creation, be swept from the surface of the earth, to give place to beings as much superior to him as he is to the most elevated of the brutes. The short experience of a few thousand years—a mere drop in the ocean of eternity—is insufficient to warrant a contrary conclusion. Still less will the contemplation of past creations, and the existing constitution of nature, justify the proud assumption that man is the sole end and object of the grand system of animal existence.

In surveying the different species whose remains are found in the fossil state, it will be expedient to deviate from the order of the Animal Kingdom, and to follow that which the Baron

has observed in the *Ossements Fossiles*, as by this means the reader will be better enabled to understand the order of succession, and the respective geological positions of the species described.

NOTE.—As, in our earlier part of this essay, we have stated, in deference to the opinion of Baron Cuvier, that the existing causes which now modify the earth's surface are insufficient to produce catastrophes on such a scale as that of those we have been surveying, it is but justice to mention that this point has been mooted, with much force of argument, in a very able article on the present subject in the *Quarterly Review* for September, 1826. Some very strong facts are there adduced, relative to the action of earthquakes and volcanoes to a very great extent, and also proofs of derangement in comparatively recent strata, which, though partial, was evidently so violent as to prove that the disturbing forces still existed in all their pristine vigour. We must, however, waive any further discussion of this kind, and content ourselves with referring our readers to the article in question, which, for its extent, contains as lucid an epitome of all the latest information on this interesting topic as we have ever had the pleasure to peruse.

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## THE FOSSIL ELEPHANT,

CALLED MAMMOTH BY THE RUSSIANS.

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It would be an endless task, and utterly inconsistent with the plan of our present sketch, to indicate all the places on this globe in which the fossil remains of the elephant have been found. They have been discovered, in fact, in every country, and at every epoch of time. We shall, therefore, content ourselves with a brief geographical view of the principal situations where they have been detected.

We find traces of such discoveries from the time of the ancients. Theophrastus has mentioned the subject in a work now lost, but his testimony has been preserved by Pliny, in the thirty-sixth book of his Natural History.

In consequence of the great resemblance of certain bones in the elephant to those of man, some tolerably good anatomists have been so far imposed on, as to take them for human bones. The pretended discoveries of the trunks of giants, so frequently alluded to by the writers of antiquity, and of the middle ages, are probably to be referred to this source. There are, indeed, bones sometimes spoken of, of the most prodigious magnitude, being eight or ten times the dimensions of those of the elephant; these we might be inclined to refer to the cetacea, if the measurements given by those writers were exactly to be relied on.

It was for some time a prevailing opinion, that the elephants whose osseous remains have been found in certain countries, had been transported thither by man. As long as these discoveries were confined to Italy, and other countries much frequented by the Macedonians, the Carthaginians, and the Ro-

mans, they were sufficiently explained by the prodigious number of elephants possessed by these respective nations. The Macedonians were the first Europeans who possessed any, and Alexander, after the defeat of Porus, brought a sufficient number from India, to enable Aristotle to form very precise notions respecting them. It is certain that this great philosopher was much better acquainted with the elephant's mode of copulation, of sucking, and, in truth, with almost all the other details of its history, than the Count de Buffon. Every thing which he relates concerning these points, has been confirmed by the testimony of recent observers in India.

The princes of the house of Seleucus always maintained a considerable number of these animals. Seleucus himself, surnamed Nicator, received fifty from Sandrocottus, in exchange for an entire district on the banks of the Indus. Plutarch also assures us, that this prince and his allies had four hundred of these animals at the battle of Issus, in which they were victorious over Antigonus, three hundred and one years before Christ.

Antiochus the Great employed two hundred elephants at the battle of Raphia, against Ptolemy Philopator, who had but seventy-three, and fifty-four in that of Magnesia against the Romans, who had but sixteen. This superiority, however, proved but of small utility, inasmuch as he was worsted in both engagements.

Pyrrhus was the first who brought elephants into Italy, and the Romans, who were strangers to these animals, gave them the name of Lucanian oxen, from the circumstance of Pyrrhus having disembarked at Tarentum. Four of these, taken by Curius Dentatus, were the first ever exhibited at Rome.

When Metellus defeated the Carthaginians in Sicily, in 502, A. R., he transported their elephants to Rome on rafts. Authors differ respecting the number of those animals, Orosius makes them one hundred and four, Seneca one hundred and twenty, Eutropius one hundred and thirty, and Pliny one

hundred and forty-two. All these, according to Varro, were massacred in the circus, inasmuch as the Romans did not know how to dispose of them.

Elephants soon came to be very generally exhibited in the circus at Rome. They were sometimes opposed in combat to bulls. Germanicus exhibited some, which danced in a clumsy sort of style, and others were shown in the time of Nero which danced on the rope, and performed many other extraordinary feats of address. It is remarkable also that these elephants were born in Rome, which, as well as the fact of their frequent propagation there, we learn from two very remarkable passages in *Ælian* and *Columella*.

Down to the time of the emperor Gallienus, the exhibition of elephants was pretty constant at Rome. This prince exhibited the last that were introduced in the Roman games. They were ten in number.

Thus it appears that, at known historical epochs, a considerable number of elephants existed in Italy, and in other countries under the dominion of the Romans. It was therefore not unnatural to attribute the origin of the osseous remains of those animals found in such places, to individuals which existed on the soil in authentic periods of history. There is no doubt that some of them may be referred to this source; but, if we consider the usual circumstances under which such remains are found, we shall be inclined to believe that but comparatively a small number are in this predicament. They are constantly discovered to be intermixed and confused with the bones of the rhinoceros and the hippopotamus, animals which were certainly not transported there by Hannibal or the Roman armies.

We shall now present the reader with a brief exposition of the principal places in Italy where these bones have been discovered.

The largest tusk was found near Rome, in 1789, by the Duke de la Rochefoucauld and M. Desmarest. It was ten feet

long and eight inches in diameter, though not entire. About 1664, some remains of this kind were found at the entrance of the Vatican, in digging foundations. Baccius speaks of similar discoveries in this city as long ago as 1582. And it is much more than probable that the body of Pallas, the son of Evander, found, or pretended to have been found, in the reign of the Emperor Henry III., in the middle of the eleventh century, and which was said to have exceeded the walls of the city in height, was nothing but some remains of this description.

In many other parts of Rome elephantine remains have been found, and in whatever direction an observer may proceed from that city, abundance of such bones will be found. They are discovered throughout all the Papal domains, and, in following the course of the Tiber, the Clanis, and the Arno into Tuscany, they grow still more numerous.

It would be endless to notice all the places where fragments have been discovered of the elephant. We must therefore confine ourselves to the most remarkable facts.

In the Val de Chiano, the Grand Duke Ferdinand II., in 1663, had an entire skeleton disinterred, some of the bones of which are still preserved at Florence, according to Targione. It is proper to notice, that some of those remains have been found in that sort of consolidated sand, called *tufo* by the Italians, which contains marine bodies and foreign wood in a state of petrification.

They are so common in the small earth-hills which border the upper part of the Valley of Arno, that the peasants used formerly to employ them, in conjunction with stones, in building those little walls that enclose their farms. But now that they know their value, they preserve them, and sell them to travellers.

Doctor Targione Tozzetti writes to Buffon, in 1764, concerning the elephantine remains found near the castle of Cerreto Guidi, between the lake of Tuccionio and the Arno. He says that they belonged to individuals of very different ages, some

of them exceedingly young, and that they were found intermingled with the bones of many other land-animals, such as oxen, deer, and horses.

In consequence of the abundance of these bones, the cabinets of natural history in Tuscany are altogether filled with them. As Hannibal, after the battle of Trebbia, crossed the Apennines, and traversed the whole length of the Vale of Arno, to march against the consul Flaminius at Arezzo, as he halted for a short time near Fiesole, and then must have passed under Arezzo, and pursued his course along the Vale of Chiana, to arrive between Cortona and the the Lake Thrasymane, it was natural enough to consider the first bones of elephants discovered in these districts as the remains of those which were attached to the Carthaginian army. This opinion has been maintained by Stenon, a learned Dane, in his treatise, "*De Solido intra Solidum contento.*" But, according to Eutropius, Hannibal brought only thirty-seven elephants with him into Italy; and we are informed by Polybius, that they all perished from the effects of cold, after the battle of Trebbia, with a single exception. Livy, who is more minute in his accounts, tells us that Hannibal had eight remaining after that engagement, seven of which died very shortly, during the vain attempt of that general to cross the Apennines in winter. But both authors agree, that, in spring, when he descended into the marshes of the Lower Arno, he had but a single elephant, on which he himself was mounted during that severe march, in which he lost his eye from a defluxion.

Now, it is very clear that this single elephant could never have supplied the immense quantity of bones that are scattered through Tuscany. Besides, there are as many bones found of the rhinoceros and the hippopotamus as of the elephant, confusedly intermingled in the same strata; and, consequently, we can never believe that the elephantine remains are derived from animals employed in war.

We may also observe here, that those bones are found usually

at the base of those little clay-hills which fill the intervals of the calcareous chains; that in the strata containing them is found petrified and bitumenized wood, which M. Dolomieu supposes to be oak, and that this again is covered by strata of marine shells, mixed with arundinaceous plants, and by immense banks of argillaceous earth.

The north of Italy does not abound less in elephantine remains. Without, however, descending to particulars, we may remark that the same observations which we have made above, relative to the locale of the others, are equally applicable to these.

There are several relations in authors of the bones of giants disinterred in Sicily, which may, for the most part, be referred to elephantine remains.

From the wretched state of oppression and confusion in which Greece has so long been, we can expect no rational account of her fossil remains. Still, however, that elephantine bones were among the number may be reasonably concluded, from the many accounts we meet with in both ancient and modern writers, concerning the bones of giants discovered both on the continent and in the islands of Greece.

Similar stories are related of Spain. But it is certain that there are some remains of the fossil elephant in the royal cabinet at Madrid. In all parts of France, these bones have been discovered in the greatest abundance. We know, however, from historical testimony, that comparatively very few of these animals were carried into that country. The only instances of this kind that we read of are, when Hannibal passed through the southern provinces, and when Domitius Ænobarbus marched against the Allobroges and the Arverni. Some of these remains have been found at a depth of eighteen feet in the marly and argillaceous strata near Paris.

The fossil elephants of the Belgic have long been known and described. The absurd notions concerning the bones of giants, were combatted by the learned Van Gorp, as early as

the sixteenth century. But he, as was usual in his time, attributed those remains to the expeditions of the Romans. In the environs of Strasburgh many bones have been found, and they are abundantly scattered through the vallies of Switzerland. The history of a giant disinterred near Lucerne in 1577, made almost as much noise as a similar discovery in France, which was considered to be that of the body of Teutobocchus, king of the Cimbri. Felix Plater, a celebrated professor of medicine, made a drawing of a human skeleton, of the supposed height of the being to whom the fossil remains belonged, which was only nineteen feet. The Lucernese have made this pretended giant the supporter of the arms of the city.

These remains are very abundant throughout all Alsace, along the entire courses of the Rhine and the Meuse, and naturally to be expected in the beds of alluvion collected in the mouths of those rivers. We, therefore, find that Holland abounds in those remains.

But Germany is the country beyond all others in which the greatest quantity of fossil elephantine bones have been discovered. This, as the Baron Cuvier remarks, is not perhaps because that country actually contains more of these remains, but because there is scarcely a district in the empire without some man of intelligence and education, capable of scientific researches. As early as 1784, Merk reckoned no less than eighty different places, in which those fossils were found. M. de Zach increased the number to more than one hundred, and Blumenbach has doubled it. Were we to enter even into a superficial description of those discoveries in Germany, we might write a volume. Remains have been found in the basins of the Danube, the Elbe, and the Weser; in every part, in short, of this immense empire, in regions where the Roman armies never penetrated, and where, consequently, the presence of such remains cannot be attributed to Roman importation. Indeed, when we consider the immense abundance of those fossils, the situations in which they are generally found, the other ani-

mal and vegetable remains with which they are intermingled, we cannot hesitate to renounce an hypothesis of this kind. A skeleton was discovered at Tonna, in the territory of Gotha, in 1696. The physicians of the country consulted by the Duke, declared the bones submitted to their inspection to be mere *lusus naturæ*, and supported this opinion by many profound treatises. Teutzel, however, the librarian of this prince, compared each bone separately with its analogous part in the elephant according to the description of Allen Moulin, and some remarks of Aristotle, Pliny, and Ray, and clearly demonstrated the resemblance. He also proved, from the regularity of the strata under which this skeleton was found, that it could not have been brought there by human means, but by some general catastrophe, such as the Noachian deluge. Yet, so far did the fondness for the contrary hypothesis prevail, that, as long as only isolated discoveries of bones were made in those parts of Germany where the Romans had not been, that they were referred to an elephant sent to Charlemagne by the Caliph Haroun-al-Raschid, which arrived as far as Aix-la-Chapelle, and might have been conducted farther!

Let us now pass to our own islands, which, from their situation, could not in ancient times have received many living elephants; and yet we shall find as great a number of fossil remains here, in proportion, as on the continent. It is true, indeed, that Polæenus reports that a single elephant was brought hither by Cæsar, but that will hardly be deemed more sufficient to account for our British fossils, than that of Charlemagne is for the elephantine remains of Germany.

We shall briefly notice the more remarkable detections.

Sir Hans Sloane possessed a tusk discovered in Gray's-Inn-Lane, twelve feet under ground, in the gravel bed. Bones of the elephant, the rhinoceros, the hippopotamus, the deer, and the ox, were discovered near Brentford, mixed with land and fresh-water shells, of which remains a partial description appeared in the "Philosophical Transactions," in 1813. They

were found in a bed of gravel, and upon the great stratum of blue argilla which is so considerably extended over England and France.

In 1815, three large tusks and other elephantine bones were found at Newnham, in Warwickshire, and with them two skulls of the rhinoceros, and several stags' horns. All these fossils were found in gravel, thickly mixed with argilla.

In 1808, a large skeleton was found near Harwich, supposed to be about thirty feet in length. But the bones broke immediately on being touched.

To be brief, remains of the elephant have been found in great abundance in various parts of this island, but the most remarkable discovery of them was in the cave of Kirkdale, in Yorkshire, with a variety of other fossils, so ably described by Professor Buckland, in his admirable work "*Reliquiæ Diluvianæ.*" There have been also fossil remains discovered in Ireland. Scandinavia, a country so little adapted to the sustenance of elephants, contains many of their fossil bones. They are found in Sweden, Denmark, and Norway, and even in Iceland, where, according to the report of Torfæus, a cranium and tooth of prodigious size were dug up.

Those immense sandy plains which commence to the east of Germany, give name to Poland, and extend along the breadth of the Russian empire, to the Oural mountains and the Caspian sea, are not less rich in elephantine remains. They are found in the basins of the Oder, the Vistula, and the Dniester, and on the banks of the Hypanis. Through the vast empire of Russia these remains are immensely abundant, especially in those very provinces where we should least expect to find them, in the frozen regions of Siberia. They have been found near St. Petersburg, near Archangel, in the valley of the Dwina, near Kostynsk, on the banks of the Tanais, and in the sandy and ferruginous strata by the Wolga. In this last situation, a cranium was unburied, measuring four feet in length. But they are so numerous in all Asiatic Rus-

sia, that the inhabitants of Siberia have invented a fable to explain their presence. They have supposed those bones to belong to a subterraneous animal, living like the moles, and unable to endure the light of day. This animal they call *Mammoth*, according to some etymologists, from the word *mamma*, which, in some Tartar idiom, signifies the earth, or, according to others, from the Arabian word *behemoth*, or *me-hemoth*, an epithet which the Arabs still attach to the name of the elephant. The Siberians call the fossil tusks the horns of the mammoth, and they are so numerous and so well preserved, especially in the northern parts, that they are employed for the same purposes as fresh ivory, and form so lucrative an article of commerce that the czars formerly reserved the monopoly of it to themselves.

The Chinese are acquainted with this fable of the subterraneous animal, which they call *tien-schu*, the signification of which word is, *mouse that hides itself*. They describe it as continually remaining in caverns under ground, resembling a mouse in form, but of the size of an ox or buffalo. It is of a dun colour, and has no tail. This is the statement of one writer. Another tells us that its tail is an ell long, the eyes small, and it dies instantly when it sees the rays of the sun or moon. He adds that, during an inundation of the river *Tan-schuann-tuy*, in 1571, several of these animals were seen in the neighbouring plains. M. Klaproth adds, from a Mantchu manuscript, that these animals are never found but in cold countries, towards the northern sea; that the bones resemble ivory, and have no fissures; and that the flesh is of a cold nature, but very wholesome.

Those immense rivers that descend to the Icy sea, are continually laying bare the remains of elephants. It was imagined by M. Patrin, that they were brought down by those rivers from the neighbouring mountains of India. But there are not fewer remains along those rivers which come from the north, such as the *Volga*, the *Tanaïs*, and the *Jaik*; nor by the

Lena, the Kolima, the Indigirska, and the Anadir, which descend from the icy mountains of Chinese Tartary. We may add that the Irtish is the only river which approaches near enough to the mountains of Thibet to allow the application of M. Patrin's hypothesis, and that elephantine remains are found in the peninsula of Kamschatka, whither they could by no possibility have arrived from India.

We are assured by M. Pallas, that in all Asiatic Russia, from the Tanaïs to the promontory of Tchutchis, there is not a single river or stream on whose banks, or within whose bed, the bones of elephants are not found, with those of other animals foreign to the climate. This observation applies to the lower declivities, and to the immense slimy and sandy plains; for the more elevated regions, the primitive and schistous chains, are equally destitute of those remains and of marine petrifications. Their prodigious abundance would be sufficient to exclude all explication from expeditions conducted by men. But what sets this hypothesis totally aside is, that here, as well as in Germany, Italy, and France, they are found intermingled with the bones of other wild animals: nay, that they are constantly found in strata filled with marine productions.

The most remarkable fact of all is, that in some places the bones of elephants have been discovered with pieces of the flesh still remaining, and other soft parts. The opinion of the Siberians is, that these animals have been actually disinterred with their flesh remaining entire, fresh, and bloody; but this is mere exaggeration, founded, however, on the fact of the flesh having been occasionally discovered in a state of preservation, from the agency of frost.

Isbrand-Ides speaks of a head, the flesh of which was found in a state of putrefaction, and Müller of a tusk, the cavity of which was filled with matter resembling clotted blood. Such facts might be doubted, were they not confirmed by subsequent relations of the most undoubted authenticity. In 1771, near Vilhoui, a rhinoceros was disinterred entire, with the flesh,

skin, and hair remaining. Since then an elephant was discovered on the banks of the Alaseia, a river which flows into the Icy sea beyond the Indigirska. It was in an upright position, was almost entire, covered by its skin, to which some long hairs were still attached. Another fact of this kind is so surprising, that it deserves a more detailed account.

In 1799, a Tongoose fisherman observed, on the borders of the Icy sea, near the mouth of the Lena, in the midst of the fragments of ice, a shapeless mass of something, the nature of which he could not conjecture. The next year he observed that this mass was a little more disengaged. Towards the end of the following summer the entire side of the animal and one of the tusks became distinctly visible. In the fifth year, the ice being melted earlier than usual, this enormous mass was cast upon the coast, upon a bank of sand. The fisherman possessed himself of the tusks, which he sold for fifty rubles. Two years after, Mr. Adams, associate of the academy of St. Petersburgh, who was travelling with Count Golovkin, on an embassy to China, having heard of this discovery at Yakutsk, repaired immediately to the spot. He found the animal already greatly mutilated. The flesh had partly been cut away by the Yakoots for their dogs, and some of it had been devoured by wild beasts. Still the skeleton was entire, with the exception of a fore-leg. The spine of the back, a shoulder-blade, the pelvis, and the rest of the extremities, were still united by the ligaments and a portion of the skin. The other shoulder-blade was found at some distance. The head was covered with a dry skin. One of the ears, in high preservation, was furnished with a tuft of hair, and the pupil of the eye was still discernible. The brain was found in the cranium, but in a state of desiccation. The under-lip had been torn, and the upper one being utterly destroyed, left the molars visible. *The neck was furnished with a long mane.* The skin was covered with black hairs, and with a reddish sort of wool. The remains were so heavy, that ten persons had much diffi-

culty in removing them. More than thirty pounds weight of hairs and bristles were carried away, which had been sunk into the humid soil by the white bears when devouring the flesh. The animal was a male. The tusks were more than nine feet long, and the head, without the tusks, weighed more than four hundred pounds. Mr. Adams collected, with the utmost care, all the remains of this singular and valuable relic of a former creation. He re-purchased the tusks at Yakutsk, and received for the whole from the Emperor Alexander eight thousand rubles.

These are not the only discoveries of the kind made in the Russian empire; and facts so well authenticated and detailed will not permit us to doubt of anterior testimonies on the same subject, while they also prove a most important point, namely, that these animals must have been arrested by the ice at the moment of their death.

A most extraordinary circumstance, which we read in the account of Belling's voyage, is, that certain islands in the Icy sea abound more in elephantine remains, in proportion to their extent, than any other part of the globe! These islands lie to the north of Siberia, opposite to the shore which separates the mouth of the Lena from that of the Indigirka. That which is nearest to the continent is thirty-six leagues in length. The whole island, with the exception of a few little rocky mountains, is composed of a mixture of sand and ice. Accordingly, when thaw takes place, the bones of the mammoth are found in the most prodigious abundance. Nay, this writer adds, (following the report of an eye-witness,) that the whole island is composed of the bones of this extraordinary animal, of the horns and crania of the buffalo, or some animal which resembles it, and some horns of the rhinoceros. That this is exaggeration there can be little doubt, but it serves to prove the wonderful abundance of those fossil remains.

In a second island, about five leagues farther, these bones and teeth are also found; but in a third, about five and twenty leagues to the north, they are no longer discovered.

The south of Asia is very far from having furnished these remains in a similar degree of abundance. The most southern regions of this continent in which the fossil bones of the elephant are said to have been found, are the neighbourhood of the sea of Aral, and the banks of the Jaxartes. Pallas tells us that the Bucharrians sometimes fetch ivory from the borders of this river.

But, in fact, every thing relative to those fossil remains in the south of Asia, is mere report and conjecture. The ancients talk of the bodies of giants found in Syria and Asia. Pausanias tells us of the body of Geryon, or Hyllus, found in Upper Lydia, and of another, eleven cubits in length, discovered in the bed of the Orontes. These may be referred to elephants.

It is singular enough that these remains should not be found in climates to which the elephant is native, and has been as far back as historical records extend. Can we suppose that none are buried there, or that the bones have been decomposed by the force of heat? It is very possible that instances of their discovery have been passed over in those countries, as presenting nothing unnatural or extraordinary. It is also by no means improbable, that the mammoth was an animal intended to live in the cold climates of the north, from the fact of its having been covered with long hair and a thick wool. Geologists who visit the torrid zone would do well to extend their researches on this subject. It appears, however, that some discoveries of this kind have been made in northern Africa, where elephants do not exist at the present day. They did so, however, formerly, and seem to have been native to Mauritania, according to the report of all the ancients; and we know the Carthaginians had plenty of them. But there are few accounts from this quarter sufficiently authenticated or detailed to identify the species.

We now proceed to the New World, where the elephant has never been found in a living state, and where the species could never have been destroyed in earlier times by the weak and

wandering hordes of barbarians that then occupied the country. Still we find the remains of the fossil elephant in very considerable abundance, especially in the northern division of that mighty continent. Buffon imagined that they existed in that part only in consequence of being unable to cross the isthmus of Panama, when the gradual cooling of the earth had impelled them southwards. This hypothesis cannot stand a moment's reflection, for many parts of Mexico are sufficiently warm for the elephant to live in; moreover the theory does not rest on correct facts, as the bones discovered in Buffon's time did not belong to the elephant, but to the mastodon.

The bones of the true elephant are found in tolerable abundance throughout North America. For this we have the testimony of many recent writers, who clearly distinguish the teeth and bones thus discovered from those of the mastodon. Respecting the peculiar species to which those elephantine remains belonged, all the accounts are not so clear as might be wished. Catesby mentions an instance in which some African negroes recognised the resemblance of some fossil molars, discovered in Carolina, to those of the elephant of their native continent. Mr. Barton talks of teeth and bones dug up in various parts of North America, as resembling those of the Asiatic elephant. But it seems more probable, from the testimony of Mr. Rembrandt Peale and others, that these and the Siberian remains belong to one and the same species. This opinion is corroborated by the remains of elephants sent to the Baron Cuvier, by M. de Humboldt, from Spanish America. These our illustrious author discovered exactly to resemble those of the Siberian species.

A fact worth noticing here is, that the elephantine remains found in Kentucky were far advanced in a state of decomposition: from which Mr. Peale concludes, that the destruction of the elephant in America was considerably anterior to that of the mastodon.

The Spanish accounts of Mexico and Peru are filled with

relations of the bones of giants found in several parts of those countries. But we cannot, with any certainty, apply these stories to the elephant, inasmuch as they are equally applicable to the mastodon, whose teeth have a still closer resemblance to those of man.

We shall close this article with a brief view of the comparative anatomy of the fossil and living elephants.

Without descending to minutiae, which would be inconsistent with our limits, we shall dwell simply upon the most striking points of difference. The laminae of the molar teeth of the fossil elephant (comparing teeth of equal length) are narrower and more numerous than those of the Indian species. From this it results, that the number of laminae employed at a time in trituration must have been more numerous in the fossil elephant.

The lines of enamel which separate the divisions of laminae are more slender and less *festooned* in the fossil teeth.

The absolute, as well as proportional, magnitude of the fossil teeth is greater.

These three characters are in accordance to the differences of the jaws and crania.

The two first are not invariably constant in all the fossil specimens, but this may be referred to the difference of ages.

We are not aware that similar differences in the magnitude of the tusks, relatively to sex and variety, existed in the fossil elephant as they do in the Indian species. Nor do we know their exact limits as to smallness. But their magnitude was considerably greater than in the living species, more especially than in the African. The texture is precisely the same in all, nor is it different in the mastodon.

In a number of fossil specimens the tusks are more curved.

Upon the whole, however, the Baron is of opinion that the tusks do not constitute a character of great importance.

The cranium of the elephant is too cellulous, the osseous plates of which it is composed too slender, to admit easily of

perfect preservation in the fossil state. But five crania have been sufficiently preserved, to which we may add that of the Siberian skeleton above mentioned, to determine the characters.

The first striking difference is the excessive length of the alveoli of the tusks, being found in one instance to be triple that of those in the Indian or African elephant of the same dimensions. Also the triturating face of the molars, instead of meeting the alveolar ridge, must have cut the tube of the alveolus at one-third of its length. This difference, as we shall see, accords with the form of the lower jaw, and must have necessitated a different conformation in the trunk of the fossil elephant: for either the points of attachment for the muscles of the trunk were the same as in the living species, that is, the upper part of the nose, and the lower edge of the alveoli of the tusks, which would make the basis of this organ three times as thick in proportion, or the attachments were totally different, and then the whole structure must have been totally different.

The zygomatic arch was differently figured; the post-orbital apophysis of the os frontis longer, more pointed, and more crooked; and the tubercle of the os lachrymale thicker and more projecting.

These differences were first established upon a drawing of a cranium, by Messerschmidt, and have been since verified on several others.

Another difference not less authenticated, and which accords with those of the lower jaw, is the parallelism of the molars. As to the lower jaws, in the Indian and African species, the lower teeth are converging forward, like those above. The canal, therefore, is hollowed in the middle, and long and narrowed at the anterior point of the jaw.

The teeth in the fossil jaws are nearly parallel. The canal, therefore, is wider, in proportion to the total length of the jaw. This canal is also much shorter in the African and Indian species, for the alveoli of the tusks do not descend below the extremity of the lower jaw, which is consequently advanced

between the tusks, and prolonged into a kind of pointed apophysis. But as these alveoli are much longer in the fossil heads, the jaw must have been truncated in front, otherwise it could not close. These observations have been confirmed by an immense number of well-authenticated specimens. In the bones of the spine the differences remarked are not important. But the specimens examined are but few.

The bones of the extremities are generally distinguished by greater massiveness. There are other differences, such as the lower head of the femur being distinguished by a slope between the two condyles, gradually reduced to a narrow line, instead of a wide sinking, as in the two living species. But to follow them minutely would tire our readers, and prove interesting only to the professed anatomist.

From what is known of the soft parts, we find that the skin resembles that of the living elephant, but without the brown points remarkable in the Indian species. Mr. Adams tells us that all of the skin which he had preserved was of a dark grey.

The hair may be said to be of three kinds: the longest from twelve to fifteen inches, brown colour, and of the substance of horse-hair; a shorter kind, from nine to ten inches, more delicate, and of a fawn colour, and the wool, which garnished the roots of the long hairs, four or five inches long, tolerably fine and smooth, though a little frizzled towards the root—it was of a clear fawn colour.

No animal has similar hairs, and therefore there can be no fraud in the case. It cannot, then, be doubted that the fossil elephant, such as it is found in Siberia, was an animal calculated, from the nature of its covering, to endure the temperature of northern climates.

The soles of the feet were found to be rounded, but considerably dilated, as if by the weight of the body, so as to extend beyond the edge of the foot.

We shall now conclude with a recapitulatory view of the subject, and a few general reflections.

After what has appeared in our Ninth Number of the Animal Kingdom, it will be unnecessary to refer any more to the living species. Our readers are fully enabled thereby to understand our comparative view.

The *Elephas Primigenius*, fossil elephant, or mammoth, of the Russians, may be thus briefly characterised :

Elongated cranium, concave forehead, very long alveoli of the tusks, lower jaw obtuse, cheek-teeth parallel, broader and marked with narrower stripes than the *elephas Indicus*. Its bones are only found in the fossil state. It has never been found living, nor have we any reason to suppose that the bones of the two living species have been ever found in the fossil state. The bones are very numerous in many countries, but better preserved in the north. It more resembled the Indian than the African species. It differed from it, however, by the cheek-teeth, the form of the lower jaw, and of many other bones, but especially by the length of the alveoli of the tusks. This last character must have singularly modified the conformation of its trunk, and given the animal a very different physiognomy from the Indian species. The tusks appear to have been generally large, more or less arched into a spiral form, and turned outwards. We have no proof that they differ much according to sex or variety. Its height does not appear to have much exceeded what the Indian species is capable of attaining to; but its proportions were, in general, heavier and more clumsy.

It is manifest, from its osseous remains, that it was a species more different from the Indian than the ass is from the horse, the chacal or the *isatis* from the wolf and fox.

The size of its ears is not known, nor the precise colour of the skin. The hair we have already described. This was long enough to form a mane on the neck. It would appear, therefore, as we remarked before, that these animals were adapted to sustain a climate, the coldness of which would soon destroy the Indian species.

Their remains are generally found in the loose and superficial strata of the earth, and most frequently in the alluvion which fills the bottom of vallies, or borders the beds of rivers.

They are never found alone, but intermixed with the bones of other quadrupeds of known genera, as the rhinoceros, ox, antelope, horse, and often with the debris of marine animals, a portion of which is frequently attached upon them. For this fact, so important, we have the positive testimony of Pallas, Fortis, and many other writers, and the Baron himself has had fragments in his possession, filled with millepores and small oysters. The strata which cover the elephantine remains are of no great thickness, and scarcely ever of a stony nature. These remains are rarely petrified, and but few examples can be quoted of any incruusted in stone, whether coquillaceous or otherwise. They are often found accompanied with our common fresh-water shells.

Every thing, in short, appears to announce that the catastrophe which overwhelmed them was one of the most recent which has contributed to change the surface of our globe. This catastrophe was physical and general. It was also aqueous, as is clearly proved, both by the strata in which they are imbedded, and those which are above them. They have been covered by the waters, and in very many places by waters of the same quality as those of our present sea, as is proved by similarity of marine productions. But it is not by these waters that they were transported to their present situations. They have been found in every country examined by naturalists. An irruption of the sea, therefore, which should have carried them from the habitat of the Indian elephant only, could not have spread them so far, nor dispersed them so equally.

Let us also observe, that the inundation which overwhelmed them was not elevated above the grand mountainous chains of the earth. The strata deposited by it, and which cover these remains, are found only in plains of moderate elevation. It is impossible, then, that the bodies of elephants could have

been transported across the Thibetian, the Altaic, and the Oural mountains. Moreover, these bones exhibit no marks of detrition: their ridges, their apophyses, are in perfect preservation. Even the epiphyses of those not yet arrived at perfect growth still adhere, though the slightest effort would be sufficient to detach them. The only alterations that are visible are the result of that decomposition which they have undergone in the bosom of the earth; nor can we say that entire carcasses have been violently removed. On such a supposition, it is true that the bones would have remained perfect, but it is also true that they would have been found together, not scattered. Besides, the marine productions attached to many of them prove that they must have remained some time stripped of their exuvise and separated at the bottom of the fluid by which they were covered. When this fluid overwhelmed them, they were in the places where we now find them; they were scattered far and wide, as we frequently find the bones of our own animals scattered on their native soil.

It is, then, much more than probable that the fossil elephants inhabited the countries where their remains are found at present, and that they must have perished by some simultaneous revolution, or a change of climate, which put a stop to their propagation.

Let the cause be what it may, it must have been sudden. The bones and ivory in such fine preservation in the plains of Siberia, are only so because they are congealed by the cold, which suddenly arrested the decomposing action of the elements. Had this cold taken place gradually and slowly, the bones, and still more the soft parts, would have had time for decomposition, as has been the case in warm and temperate climates. Above all, it is impossible that an entire carcass could have been found, with the skin and flesh uncorrupted, had it not been instantly enveloped by the ice which continued to preserve it.

Thus we see that every hypothesis, founded on a gradual

refrigeration of the earth, or a slow variation, whether from the inclination or position of the axis of the globe, falls to the ground of itself.

Lastly, had the present elephants of India been the descendants of the fossil refugees in their present climate, at the period of the catastrophe which destroyed the others, how shall we account for the destruction of their species in America? The elevated parts of Mexico offered them a secure escape from such an inundation as we have mentioned, and the climate is hotter than necessary for their temperament. Nor can we suppose that the same cause which extinguished the mastodon, the hippopotamus, and the fossil rhinoceros, would have spared the elephant. That those animals have ceased to exist can no longer be a subject of controversy.

#### THE GENUS MASTODON.

The *Great Mastodon* is one of the most remarkable and apparently the most enormous of all the fossil species. Whatever doubts might have existed concerning the specific difference of the *elephas primigenius*, and its utter extinction, there could be little controversy of this nature concerning the mastodon, after its remains had been properly examined. Accordingly, we find that this was the first fossil animal by whose remains naturalists were convinced of the possibility of extinct species. The monstrous bulk of the molars, and the formidable tuberosities with which they are provided, could not fail of attracting attention; and it was easy to observe that none of the larger quadrupeds with which we are acquainted, possessed teeth of similar conformation or equal volume. Daubenton, indeed, for a time was disposed to believe that some of these teeth might have belonged to the hippopotamus, but he soon renounced this error; and Buffon declared that this ancient species, the first and largest of all terrestrial animals, must be regarded as now extinct. Still he restricted this observation to the enormous hinder teeth, considering the middle and half-worn

teeth as belonging to the hippopotamus. The large femur also, dug up in the same place as these teeth, was attributed both by Buffon and Daubenton to the elephant. Dr. Hunter, however, had shown, 1767, that this part, as well as the teeth and the lower jaw, exhibited a different conformation. Still, Dr. Hunter fell into two errors concerning this animal. He confounded it with the mammoth of the Siberians, and supposed, from the structure of its teeth, that it was carnivorous. These errors were sufficiently refuted, the first by Pallas, and the second by Camper. Yet the animal continued to be called *mammoth* both by the Americans and ourselves, and *carnivorous elephant* by some naturalists,—names equally improper. These misnomers occasioned infinite confusion in the accounts of compilers, and determined the Baron to give the animal the name of *mastodon*, compounded of two Greek words, signifying *mamillary teeth*, and expressing its principal character. This was the more necessary, as it is found that the mastodon was not only a distinct species, but a distinct genus, comprehending other species.

It is above one hundred and twenty years since remains of the mastodon were first discovered at Albany, near Hudson river. They are mentioned in a letter from Dr. Mather to Dr. Woodward, in the *Phil. Trans.* 1712. He believed them to be the bones of giants, and a confirmation of the Mosaical accounts of gigantic races of mankind.

Thirty years after, a French officer named Longueil, navigating the Ohio, discovered, on the edges of a marsh near this river, some bones, cheek-teeth, and tusks. He brought back to Paris a femur, the extremity of a tusk, and three cheek-teeth, where they are still preserved. These were the first specimens of this animal seen in Europe; and from the place in which they were found the French called the mastodon, *animal of the Ohio*, though its bones have been found in many other parts.

Daubenton declared the tusk and femur to belong to the

elephant, but the teeth to the hippopotamus. But the contrary opinion even then was held by many. Another French officer informed Buffon that the Indians of Canada and Louisiana believed these bones to belong to a peculiar animal which they called *father of oxen*.

The large teeth with eight or ten points, which could not reasonably be confounded with those of the hippopotamus, were already known. One of them was even engraved by Guettard, in the Memoirs of the Academy for 1752.

When our countrymen became masters of Canada, these researches were pursued with fresh activity. Many of these bones were discovered south-east of the Ohio, by Croghan, the geographer, in 1765. The tuberculous teeth and tusks were found mingled together, without any elephantine molar, and the notion of a peculiar animal became more and more confirmed. This last-mentioned gentleman sent several chests of these fragments to London, and from a lower-jaw which was among them, William Hunter demonstrated that the animal in question differed sensibly from the elephant, and had nothing in common with the hippopotamus.

Buffon first maintained that similar teeth were to be found in the ancient continent. He founded this opinion on a tooth presented to him by the Count de Vergennes, said to have been discovered in Little Tartary. It weighed eleven pounds four ounces. Another, from the cabinet of the Abbé Chappe, was supposed to have come from Siberia. Pallas advanced the same opinion on teeth with six points, found in the Oural mountains. The Baron, however, is inclined to regard these proofs as insufficient, inasmuch as it is by no means certain that the specimens in question did not come from America.

Camper, in 1777, showed again that there was more analogy between the mastodon and elephant, than between it and the hippopotamus. He also deemed it very probable that it had a trunk. A considerable portion of the cranium and some other bones were found by Dr. Brown, in 1715.

Camper, in 1788, retracted his last-mentioned opinion on the mastodon. From some drawings presented him by M. Michaelis, he declared that he had been mistaken; that this animal had a pointed muzzle without tusks; that it did not resemble the elephant, nor could he form any opinion of its true nature. But it afterwards appeared that he took that part of the palate where the teeth approximate, for the anterior part, and, considering the pterygoid apophyses as intermaxillary bones, found, consequently, no place for the tusks.

A famous discovery, made in the commencement of the present century by Mr. Wilson Peale, founder of the Museum of Natural History at Philadelphia, seems to have set this question at rest for ever, and will require a little more detailed account. In the spring of 1801, he learned that some bones had been dug up the preceding autumn, in the neighbourhood of Newburgh, on the river Hudson. He repaired thither with his sons, and obtained from the farmer who had dug it up a considerable portion of a skeleton, which he sent to Philadelphia. There was a cranium much damaged in the upper part; the lower jaw was broken, and the tusks mutilated. At the close of autumn, after many weeks labour, were found, in the same place, all the cervical vertebræ, many of the dorsal, two shoulder-blades, two humeri, a radius and cubitus, a femur, a tibia, a peroneum, a mutilated pelvis, and some small bones of the feet. These were found between six and seven feet in depth; but many important bones were wanting, such as the lower-jaw, &c. To obtain them, Mr. Peale repaired to another spot, eleven miles distant, where bones had been disinterred about eight years before. He worked for fifteen days, collected many fragments, but not those he wanted. However, on his return he met a farmer, who had found some bones three years before, and who conducted him to the place of his discovery. Here, after much labour, he was fortunate enough to find a complete under jaw, and many other principal bones. With

the materials he had thus obtained by three months of laborious research, he formed two skeletons, copying artificially from the bones of one what was wanting in the other, and from the bones of one side what was deficient on the opposite.

Since this discovery, the osteology of this great animal may be considered as completely known, with the exception of the upper part of the cranium. The most complete of these skeletons is placed in Mr. Peale's museum at Philadelphia; the other was brought to our capital by one of his sons, and publicly exhibited.

Besides these materials, there are many in the museum at Paris. The most remarkable constitute the present made to that repository by Mr. Jefferson: these are an enormous tusk, two half lower-jaws, one of which, having belonged to a young subject, is of great interest, as regards the teeth, a tibia, a radius, almost all the bones of the tarsus, metatarsus, carpus and metacarpus, some phalanges, ribs, and vertebræ. The bones of the mastodon, as well as those of the other fossil species which accompany them, are most generally found in marshy places, where there is a sort of brackish water, which attracts wild animals, especially deer, to which places the Americans have, for this reason, given the name of *lick*. The most celebrated of those depôts near the Ohio is called *Big-bone-lick*.

There is a spot in Kentucky, to the south-east of the Ohio, sunk in between small hills, and occupied by a marsh, in which is a small stream of brackish water. The bottom of this consists of a black and stinking mud. Here, and on the borders of the marsh, the remains of the mastodon have been found in the most astonishing profusion. This mud is intermixed with a fine sand, and some ligneous debris are distinguishable in it. On being tried with nitric acid, it exhaled a fetid odour, indicative of some animal principle, and being analysed was found to be composed of about sixty-five parts of argilla, sixteen of sand, and five of sulphate of lime to every hundred. The

argilla retained a little carbonate of lime and sulphuret of iron. There was also a little oxide of iron.

Near the river of the Osages myriads of these bones were seen, according to Mr. Smith Barton; and seventeen tusks were collected, some of which were six feet in length and a foot in diameter, most of them far advanced in decomposition.

One of the most remarkable of the depôts of these bones was found at Withe, in Virginia, five feet and a half under ground, on a bank of calcareous stone. One of the teeth weighed seventeen pounds. In the midst of these bones was found a mass of little branches, grass, and leaves, in a half-bruised state. Among these was a species of rose, now common in Virginia, and the whole was enveloped in a kind of sock, which was considered to be the stomach of the animal. The substratum of this soil is a calcareous stone, full of coquillaceous impressions. The caverns there abound in nitre, sulphate of soda, and magnesia.

Not to be tedious as to localities—the bones of the *great mastodon* are found in abundance all over North America, from the forty-third degree of north latitude, north of Lake Erie, as far south as Charlestown, in Carolina, in thirty-three degrees.

As far as we know, the bones of this enormous animal do not exist in any other country of the globe. They are always found at moderate depths, and exhibit few marks of decomposition, and none of detrition; a proof that, like the other fossils, they remained in the places where they are found since the period of the animal's destruction. Those on the river of the Great Osages were found in a vertical position. The ferruginous substance with which they are tintured, or penetrated, proves that they have been a long time imbedded in the interior of the earth.

Indications that the sea rested on, or passed over them, are more rare than in the case of elephantine remains. No remains of shells or zoophytes have been found upon their bones, nor, according to all accounts, in the strata from which they have been taken. This is the more singular, as the salt-marshes

where they have been most usually found, might be considered as the remains of a more extensive fluid which had overwhelmed them.

Mr. Barton considers that the salt water has been a main cause of their preservation. It would even appear that some soft parts have been occasionally found, which, considering the heat of the climate, is wonderful. Some savages, who saw five skeletons in 1762, informed Mr. Barton that one of the heads had "*a long nose, under which was the mouth;*" and Kalm, speaking of a large skeleton discovered in a marsh, in the country of the Illinois, and which he took for that of an elephant, says that the form of the *beak* was still observable, though half decomposed. These two facts seem to confirm the opinion, that the triturated plants above-mentioned were, in reality, the materials which filled the stomach of the animal.

Many hypotheses have been formed on the origin of these bones, and the causes of the animal's destruction. The Shavanois believe that men of similar proportions existed with those animals, and that the Great Spirit destroyed both with his thunders. The savages of Virginia say, that a troop of these tremendous quadrupeds destroyed for some time the deer, the buffalo, and all the other animals created for the use of the Indians, and spread desolation far and wide. At last "*the Mighty Man above*" seized his thunder and killed them all, with the exception of the largest of the males, who, presenting his head to the thunderbolts, shook them off as they fell, but, being wounded in the side, he betook himself to flight towards the great lakes, where he still resides at the present day.

Such stories sufficiently prove that the Indians have no knowledge of the actual existence of the species in those countries over which they wander.

Lamanon imagined the mastodon to be some unknown species of the cetacea. A.M. de la Coudrenière having found, in some account of Groënland, that the savages of that country pretended to an animal, black and hairy, of the form of a bear, and six

fathoms in height, refers not only the mastodon, but the mammoth, to this fabulous monster. This confusion of the two species probably made Mr. Jefferson think that the centre of the frozen zone is the spot where the mammoth arrived at its full perfection, as the countries situated under the equator are the best calculated for sustaining the elephant.

Let us now consider the osteology of the Great Mastodon, beginning with the cheek-teeth, the most important character.

Their form is the most remarkable point about them. The coronal approaches more or less to a rectangular figure. The substance is two-fold, the ivory and the enamel. The latter is very thick, but there is no appearance of that cortical substance, so remarkable in the elephant.

This coronal is divided by very open furrows into a certain number of transversal prominences, each of which is itself divided by a slope into two thick obtuse points, something like quadrangular pyramids, a little rounded. Thus the coronal, as long as it remains unworn, is furnished with thick points, disposed in pairs.

It will be seen that these teeth have no relation to the teeth of the carnivora with one principal and longitudinal edge, divided into notches like a saw. There is only a difference of proportion between these transverse prominences, divided into two points, and the little transverse walls, with edge divided into many tubercles, in the teeth of the elephant. But in the latter, the furrows which separate the prominences are filled with the cortical substance, whereas, in the mastodon, they are filled with nothing. From this it happens, that the coronal of the elephant soon becomes flat from detrition, but nevertheless remains always furrowed transversely, while that of the mastodon is for a long time mammillated. Its protuberances become at first truncated by detrition into a lozenge-form, and at last, when worn flat, its surface is perfectly even, or uniformly concave.

The mastodon must have made the same use of its teeth as

the swine and the hippopotamus, for the structure is similar. It must have fed on tender vegetables, roots, and aquatic plants, and could not have been carnivorous.

The difference in the teeth of the mastodon consist, chiefly, in the number of points, and the relation of length to breadth.

There are three sorts: one almost square, with three pairs of points; another rectangular, with four pair; a third, longer, somewhat contracted behind, with five pair, and an unequal heel. The first is the most worn, the last, on the contrary, very little so. This points out the order of their growth and position. The disposition of the cheek-teeth in the adult is thus,  $\frac{1}{2}$ , two with six points, and two with eight points above; two with six points, and two with ten points below.

Beside these eight molars in the adult, we find in the young subject, that others preceded them, which fell successively. The succession of growth took place, as in the elephant, from front to rear. When the hinder molar began to pierce the gum, the front one was ready to fall.

The effective number of cheek-teeth which could act together, was eight in the young subject, four in the old. This shows that the mastodon could not have been of the enormous size that Buffon and others imagined, who were led to this conclusion by the error of believing the cheek-teeth equal in number to our own.

These teeth vary in magnitude, and are found in different stages of detrition. But to pursue all their variations would be inconsistent with our plan, and we must, therefore, refer the reader for minuter information to the great work of the Baron.

On examining the lower jaw, we find that, like the elephant and the morse, the mastodon had no incisors or canines below; that the lower jaw terminated in front in a hollowed point of a sort of canal, and that the posterior angle, though obtuse, was yet strongly defined, and not circularly rounded, as in the elephant. The condyle differs little from that of the elephant,

but all the ascending part is less elevated in proportion. The coronoid apophysis is raised to the level of the condyle, while it is much lower in the elephant. The longitudinal part is less elevated in proportion to its length, but equally inflated, especially behind. The lower jaw of Mr. Peale's skeleton is two feet ten inches in length, and weighs sixty-three pounds. The principal characters of the cranium are, the divergence of the cheek-teeth in front, while those of the elephant converge, and those of the mammoth are parallel; the osseous palate extends far beyond the last tooth; the pterygoid apophysis of the palatine bones are thick beyond example. Mr. R. Peale found no trace of orbit in the anterior part of the arch; consequently, the eye must have been much higher than in the elephant. The maxillary bones have much less vertical elevation than in the elephant; the zygomatic arch is less elevated; the occipital condyles, raised in the elephant considerably above the level of the palate, are on that level in the mastodon. The mastodon appears to have had precisely the large cellulae which give so much thickness to the cranium of the elephant, and are only prolongations of the different sinuses of the nose.

We cannot precisely ascertain the elevation of the top of the cranium; but its weight, that of the cheek-teeth and tusks, cannot permit us to doubt that the occiput was considerably elevated, to furnish adequate attachments for the levator-muscles.

The entire length of the cranium of Mr. Peale's mastodon seems to have been about 1.189.

The tusks are implanted in the incisive bone, like the elephant. They are composed likewise of ivory, the grain of which exhibits curvilinear lozenges.

The tusks of the elephant are often more or less round; those of the mastodon seen by the Baron were elliptical. Their curvature varies as much as in the elephant.

The alveoli in Mr. Peale's mastodon were about eight inches deep. The direction of the tusks, on issuing from the alveoli, is

more oblique frontwards than in the elephant. Their position is disputed; Mr. Peale thinks that they were placed with the point downwards, contrary to the position of the elephant's tusks. His reasons are not very cogent, and the Baron comes to a contrary conclusion.

It seems indubitable, from anatomical reasoning, with which we shall not trouble our readers, that the mastodon had a trunk like the elephant. Mr. Peale says, that the spinous apophyses of the three last cervical vertebræ are shorter in the mastodon than in the elephant. The second, third, and fourth dorsal have very long apophyses. They decrease rapidly as far as the twelfth, after which they become very short. In the elephant they are more uniform, which argues more force in the muscles of the spine, and in the cervical ligament.

There are seven cervical vertebræ, nineteen dorsal, and three lumbar. The elephant has one dorsal vertebra, and a pair of ribs additional. The ribs are differently formed from those of the elephant; slender near the cartilage, thick and strong towards the back. The first six pair are very strong, compared with the others, which grow very short in proportion. This character, united to the depression of the pelvis, proves that the belly was less voluminous than that of the elephant.

In general, the long bones of the anterior extremity are much thicker, in proportion, than those of the hinder extremity. The pelvis is much more depressed than in the elephant, in proportion to its width. Its aperture is much more narrow. This conformation must have rendered the abdomen smaller, and the intestines less voluminous. This character, united to the structure of the teeth, would lead us to consider the mastodon as less exclusively herbivorous.

The width of the femur is another distinguishing character of the mastodon. The tibia is also much thicker in proportion to its length, compared with that of the elephant. It also differs in some minuter details.

Very exaggerated ideas were once entertained concerning

the height of the mastodon. The result of the justest measurements, and consequent calculations, seems to be, that it did not exceed ten or twelve feet at most, a stature to which the Indian elephant very commonly attains. The body, however, of the mastodon appears to have been much more elongated, in proportion to its height. The skeleton belonging to Mr. Peale measured fifteen feet, from the end of the muzzle to the posterior edge of the ischium.

The bones of the feet differ, in some minute proportions, from those of the elephant, and we may, in general, remark that they are shorter and thicker. This is especially the case with the metatarsus, and holds good in the phalanges.

To conclude: the *great mastodon*, or *animal of the Ohio*, was very similar to the elephant in the tusks and entire osteology, cheek-teeth excepted. It most probably had a trunk; its height did not exceed that of the elephant, but its body was more elongated, the limbs thicker, and the belly not so voluminous. Notwithstanding these resemblances, the structure of the molars is sufficient to constitute it a different genus. It subsisted, pretty much like the hippopotamus and wild boar, on roots and the stringy parts of vegetables. This kind of food must have attracted it to marshy places, though it evidently was not formed for swimming or living in the water, like the hippopotamus, but was decidedly a terrestrial animal. Its bones are much more common in North America than elsewhere, and most probably are exclusively confined to that country. They are better preserved and fresher than any known fossils, yet there is not the slightest proof that any of the genus are yet in existence.

*The Mastodon with narrow Teeth.*—A number of teeth have been discovered, from time to time, within the last hundred and fifty years, in various countries, the origin of which was by no means satisfactorily accounted for. These teeth have been found in different parts of France, of Italy, of Germany, and South America. Our author, from a close exami-

nation of numbers of these teeth, concludes that they belonged to a mastodon of a different species from the preceding, and which appears to have left its remains in considerable abundance in several parts of the earth.

All these teeth, like those of the great mastodon, are furnished with conic points, more or less numerous, which wear in mastication. The forms of some bones found with these teeth also resemble those of the great mastodon; and there is some reason to believe that they were also accompanied by tusks. From all this, the Baron concludes that they came from an animal of the same genus.

But these teeth are distinguished from those of the great mastodon of the Ohio, by certain specific characters. The principal and most general distinction is, that the cones of their coronals are furrowed more or less deeply, sometimes terminated by many points, and sometimes accompanied by smaller cones on their sides, or in their intervals. Mastication, therefore, produces, first, upon this coronal many small circles, and finally trefoils, or figures with three lobes, but never lozenges.

These trefoils have sometimes occasioned these teeth to be taken for those of the hippopotamus. But, independently of magnitude, the teeth of the hippopotamus have never more than four trefoils, while those of which we are speaking have usually six or ten.

It is more difficult to determine the specific characters of these various teeth, one with another,—they do not altogether resemble. That they have been differently placed in the jaw, may be judged by the number of the points. There are also differences of age, to be determined by the degree of detrition. The Baron examined two teeth, one from the turquoise mines of Simorre, in Gascony, the other from Peru, and he declares that, notwithstanding the distance between the two places, it was impossible not to recognise at once the specific identity of these teeth.

Among the fragments collected by Dombey in Peru, is a considerable portion of the lower jaw. It terminates in front by a sort of beak, like that of the elephant and mastodon, which proves that, like the two last, this animal had neither incisors nor canines below. There were two teeth in this fragment; one had five pair of points, of which the hinder were the shortest. The two first were joined in quadrilobe figures, the two following were approaching to the same state; the two last and the heel were untouched; the external side was the most worn, the internal most projecting. This must be the case to make the teeth below correspond to those above. Below, the external points form trefoils; above, the internal. This is the result of a general law in the herbivora. When the two sides of the tooth do not resemble, they are placed in contrary directions, in the two jaws. Thus, in the ruminantia, the convexity of the crescents of the upper teeth is inside, and outside in those below.

From a palate, preserved in the British Museum, and which belongs to this species, and not to the great mastodon, we find that the upper molars diverge forward like those of the last mentioned species.

Analogy renders it probable, that the species of which we are speaking, had tusks like that of the Ohio. Daubenton, indeed, says that he could recognise ivory among the fragments sent from the mines of Simorre. Two plates of ivory were found by the Baron among the fragments sent by M. Chouteau from Avary. But we want the direct proof, for no tusk nor alveolus with molar adhering has yet been found.

The lower jaw is certainly that of an animal with long tusks. That from Peru is very like the one of the Ohio. It is, however, less high in proportion. Its lower edge is less rectilinear, and its external surface more inflated. The foramina menti are more advanced. The teeth of this mastodon are much longer, in proportion, than they are broad, which induced the Baron to give it the name he has done.

Compared with that of the elephant, the jaw of the mastodon with narrow teeth has its anterior beak longer, and more narrow in the middle. It is not truncated so vertically. The foramina menti are one behind the other, not one above the other. From another lower jaw, entire behind, we find that this part was more rounded in this species than in that of the Ohio, and more resembled that of the elephant.

A tibia, brought from the Giants-Field, near Santa-fé-de-Bogota, by M. de Humboldt, is the only great bone of the extremities which has been seen. It is much mutilated at the angles, which renders the characters not well determined. A little thicker in proportion than that of the Ohio, it is yet like it in its forms. It is short, by calculation from the proportions of the teeth; but no definite conclusions can be drawn from a single bone.

It appears that the remains of this mastodon are often found accompanied by marine productions, which is not the case with the others.

The turquoises of Simorre are composed of these and other bones, penetrated and impregnated with some metallic oxide.

The stories of giants in South America seem founded on these remains. The name Giants-Field, above-mentioned, is probably derived from this source, as, according to M. de Humboldt, there is an immense accumulation of these bones there. They are found in that continent, usually, in a very high degree of elevation.

Some teeth have also been found, which seem to indicate other species of the mastodon, differing from the two preceding. M. de Humboldt brought some from South America, the tubercles of which are divided, like those of the mastodon, with narrow teeth, but which have the same canine proportions as those from the Ohio with six points, and might be taken for them, but for the trefoils. They are of two sizes; the largest are equal in magnitude to those of the Ohio. M. de Humboldt found one near the volcano of Imbaburra, in the king-

dom of Quito, at an elevation of 1200 fathoms. The other kind, also squared, are about a third less in size; they were also discovered by M. de Humboldt in South America.

In Europe, also, two teeth were found, which appeared too small to the Baron to be classed with any of the preceding species. One was sent from Saxony, but its position was unknown; the other from the neighbourhood of Orleans. The last was found in a quarry of fresh-water limestone, full of shells, &c., and the remains of the palæotherium. Its prominences, simply notched, are not so exactly divided into two points as those of the preceding. This might make us suppose another additional species. These prominences not divided show some relation with the teeth of the great tapir, but still cannot proceed from that genus, whose prominences are more separated, and whose numerous and small indentations bear no resemblance to nipples.

Thus, independently of the great mastodon, and that with narrow teeth, we find indications of four other species. The Baron would call the two from America, when their characters are determined, *the mastodon of the Cordilleras*, and *the mastodon of Humboldt*. To the first, of the European kind, he would give the name of *little mastodon*; to the second, whose hillocks, or prominences, are not completely divided into nipples, that of *tapiroidian mastodon*.

#### THE FOSSIL HIPPOPOTAMUS.

The hippopotamus has always been one of those larger quadrupeds whose history has remained in a state of obscurity, and even still is but imperfectly known. Bochart has imagined it to be the behemoth of the book of Job, but its description in that book is too vague to admit of any definite conclusions. The one given by Aristotle of his hippopotamus is so very unlike the animal in question, that it is perfectly inexplicable. He gives it the stature of the ass, the mane and voice of the horse, and the divided hoof of the ox, and says that its astra-

galus resembles that of the latter tribe; flat muzzle, mouth moderately divided, teeth rather projecting, and tail like that of a wild boar. He adds, that the skin of the back is so thick, that javelins are manufactured out of it. This strange description is almost entirely borrowed from Herodotus, who makes an additional error in asserting that the tail of the hippopotamus is like that of the horse.

It would, however, be inconsistent with our plan and limits to enter into the various descriptions given of the living hippopotamus, or into its osteology. We must be contented with such references to, both, as may be necessary to the complete elucidation of our remarks on the fossil species.

There is but one existing species of the hippopotamus hitherto known; but Cuvier has discovered two, and he thinks even four, in the fossil state. The first so nearly resembles the living species, that this great naturalist found some difficulty at first to distinguish them. The second is about the size of the wild boar; the third would seem to be intermediate between the other two, and the fourth, of which some traces have been discovered by the Baron, might have been about the size of a guinea-pig.

For the knowledge of the smaller species we are entirely indebted to the illustrious writer just mentioned, and even for the full and complete authentication of the largest of the fossil hippopotami. One of his most immediate predecessors in this very walk of science has declared, that, in the course of his researches, he could find no proof of the discovery of fossil remains of the hippopotamus, previously to the period in which he wrote. There was not, however, this very absolute dearth of information on the subject; but still the most accomplished naturalists have fallen into a very gross error, in attributing to the hippopotamus certain fossil remains which had no sort of connection with that animal. We have already adverted to the mistake of Daubenton, in referring the molar teeth of the mastodon to the hippopotamus. Peter Camper appears to have

fallen into a similar error in a description, addressed to Pallas, of a tooth in the British Museum. He could not have confounded this tooth with that of the great mastodon, because he has proved himself elsewhere to have been well acquainted with this latter animal. But as he was ignorant of the distinction between the mastodon with narrow teeth, and that of the Ohio, he might have been deceived respecting a single tooth. The teeth of that mastodon, as we have observed in the proper place, at a certain stage of detrition, exhibit some resemblance on a larger scale to those of the hippopotamus, being marked with trefoils in a similar way. But at all events, the tooth in question could not, by any possibility, have belonged to the living hippopotamus, nor to that one usually found in the fossil state, since it is four times as large as theirs.

Many more errors of this description have been committed. M. Merck describes a molar found in the environs of Francfort-on-the-Maine, as belonging to the hippopotamus, but which turned out to be an intermediate tooth of the mastodon of the Ohio, the summits of which were a little worn. M. de Luc speaks of an hippopotamus's tooth, found among volcanic productions in the same neighbourhood, but this M. Merck assures us belonged to the rhinoceros. Charles Nicholas Lang, in a work published in 1708, *Historia lapidum figuratorum Helvetiæ*, has made a still greater mistake, in attributing to the hippopotamus the teeth of the horse. It is singular enough, by the way, that lithologists should have been repeatedly deceived concerning the teeth of this latter animal, notwithstanding that the species is so very common.

Davila, a very modern writer, in the catalogue of his cabinet, describes the jaw of an hippopotamus, with five molar teeth, found in the plaster-quarries in the neighbourhood of Paris; but the Baron, whose authority respecting this *locale* is indisputable, assures us that no remains of the hippopotamus were ever found there. He is persuaded that this same jaw was a fragment of the great *paleotherium*.

Mistakes have also been made on the opposite side : genuine teeth of the hippopotamus have been, by some authors attributed to other animals. Aldrovandus, for instance, attributed to the elephant some of the teeth of this same animal ; and Besler has characterized one of its petrified molars by the simple name of *dens maxillaris lapideus*.

The first specimens by which the Baron was convinced of the presence of the hippopotamus among the fossil remains, were in the Royal Museum, and had been pointed out by Daubenton. These specimens are two in number : the first, a portion of the lower jaw on the right side, containing the penultimate and antepenultimate molar ; the second, a penultimate molar of the upper jaw, in a moderate stage of detrition. A third fragment came from the cabinet of M. Joubert, treasurer of the states of Languedoc. It is a fragment of the upper jaw, containing the last molar and the last but one, in the left side, precisely in that state of detrition in which the figures of the trefoils and other lineaments of the crown render them most easy to be distinguished.

After this the Baron found an astragalus among various fossils collected by M. Miot in the vale of Arno. He observed that its form could not sanction its attribution to the elephant or rhinoceros, nor its magnitude to any smaller animal. And as its figure resembled that of the astragalus of the swine, which of all animals approximates most to the hippopotamus in organization, no doubt was left on his mind as to the propriety of its allocation. However, for still further confirmation, he compared it with the astragalus of a foetus of the living species, then in his possession, and found no difference except in magnitude.

From M. Fabroné he subsequently received the drawings of those teeth, which had evidently belonged to the hippopotamus ; one of these was a fragment of a tusk, or lower canine. It may not be uninteresting to mark the difference of the tusks in those animals which possess them. No other animal has tusks formed like those of the hippopotamus. Those of the ele-

phant are larger, but neither angular nor striated; those of the morse, which are also larger, are very much striated towards the root, but not angular; the tusk of the narwhal is straight, but twisted spirally by the striæ of the surface. The texture of the osseous substance is likewise very different. In the elephant we find brownish traits, which cross into curvilinear lozenges, of a very regular form; in the morse there are brown grains, moulded, as it were, into a whiter substance; in the narwhal all seems homogeneous; in the hippopotamus, there are five striæ, concentrical to the contour of the tooth.

M. Fabbroni adds, that the diameter of the tusk in question bore a nearer proportion to its length than that of the African hippopotamus, and its spiral curve was also much more marked. These teeth were found in the upper vale of Arno.

The Baron travelled into Tuscany in 1809 and 1810, and found in the museum of Florence, and in that of the academy of the vale of Arno, such an abundance of fossil remains of the hippopotamus, that there could be no difficulty in recomposing a skeleton. He brought back a considerable quantity to Paris, which he had bought from the Tuscan peasants. A skeleton nearly entire, and fragments of eleven individuals, have been in the cabinet of the Grand Duke since 1816. In fact the bones of the hippopotamus are nearly as numerous as those of the elephant in the upper vale of Arno, and more numerous than those of the rhinoceros. They are found confused with both in the small sand-hills, which form the final links of that mountainous chain by which this beautiful valley is engirded.

The bones of the hippopotamus have been found at Rome and in other parts of Italy, also in France and England, but more abundantly in the vale of Arno than elsewhere.

The distinguishing characters of the great fossil hippopotamus are not quite so strongly marked as those of the elephant and rhinoceros, but still quite sufficient, on a comparison of all the bones, to prove a decided difference from the living

species. In the fossil *head* the occipital crest is more narrow, the zygomatic arches less separated behind, and that portion of the cranium bounded by these arches on the sides is larger in proportion; the junction of the cheek-bone to the muzzle is made by an oblique line, and not by a sudden slope; the occiput is more suddenly raised, so that the fall of the sagittal crest towards the interval of the orbits is more rapid, and, of course, the vertical height of the occiput is greater. In the lower jaw the interval between the two branches is more narrow.

The Baron possessed five *vertebræ*, none of which were completely similar to their correspondents in the living species.

The articular face of the *shoulder-blade* was more rounded, and had a coracoid tubercle more blunt and curved inwards. This fragment must have belonged to an individual fifteen feet long.

It is unnecessary to pursue this comparison any further, as it could not prove interesting to the general reader. It is sufficient to observe that, notwithstanding the general resemblance of all the bones to those of the living species, there are differences in every one of them, sufficiently marked to warrant a distinction of species.

*The little fossil Hippopotamus* was discovered by M. Cuvier, in a block which was for a long time in one of the magazines of the Museum of Natural History, and the origin of which was unknown. It resembled considerably the *osseous breccia* of Gibraltar, Dalmatia, and Ceuta, except that the paste, instead of being calcareous and stalactitic, was a homogeneous sandstone, filled with fragments of bones and teeth, which formed an incomparably greater portion of the mass than they do in the breccia.

With infinite labour and care, were at length disengaged from this block the remains of an animal, the existence of which had never been previously suspected.

From a block of the same description, submitted to the disposal of the Baron by M. Journu-Aubert, additional information was derived concerning this fossil species. But no remains were found in the place from which the block was taken.

From these two blocks, M. Cuvier obtained nearly all the teeth, which were found in all respects similar to those of the hippopotamus, except that they were one-half smaller in all their dimensions. Certain fragments of the jaw showed indications of that crotchet so characteristic in the lower jaw of the hippopotamus. An astragalus, a scaphoid bone, a portion of the humerus, another of the femur, a part of the pelvis, also exhibit analogous conformations, but of smaller dimensions, proportional to those of the teeth. The state of dentition and ossification sufficiently proved that this animal was adult, and consequently belonged to a species distinct from that which inhabits the South African rivers.

Some remains of an animal, which the Baron calls the *middle fossil* hippopotamus, were found in a department of the Maine and Loire, in a calcareous tufa, apparently the production of fresh water.

These fragments were not much larger than their analogous parts in the little hippopotamus; but as, in other respects, they had no more resemblance to them than to those of the great hippopotamus, there is no doubt of their having belonged to a different species; at the same time their relation to the hippopotamus is sufficiently marked to refer them to that genus. Some other teeth were found in France, which seem to indicate a species bordering on the hippopotamus, but smaller than the swine; but the Baron did not pass any definitive judgment concerning them, for want of other bones.

#### THE FOSSIL RHINOCEROS.

Singular as is the genus of the rhinoceros, it is yet less isolated in the animal kingdom than that of the elephant. It is nearly allied in its osteology to the daman, the tapir, and the horse; and among the fossils there are many genera to which it exhibits a partial approximation.

The fossil remains of the rhinoceros, though not quite so numerous as those of the elephant, are yet extremely abun-

dant. Both are most generally found together, but the teeth of the rhinoceros, being less voluminous, have been less generally remarked. These animals have not the enormous ivory tusks of the other, which could not fail, in all cases, of attracting attention; and most probably, in many instances, these constituted the motive to form collections of elephantine remains.

Having remarked that the bones of the rhinoceros are generally found in the same strata, and very often in the very same places as those of the elephant, we may observe, that there exist two, or perhaps three, large species, without reckoning one or two much smaller than the others. But, says the Baron, as this distinction is recent, it would be difficult to introduce an historical detail of the particular places where the specific bones were found. It will be sufficient to observe, that the major part of those which have been found in middle and northern Europe, as well as in Asia, belong to the species most anciently discovered, in which the nostrils are separated by an osseous partition; that it is only in Italy that fragments incontestably belonging to the other species, in which the nostrils are not separated by bone, have hitherto been discovered; and finally, that we know nothing of the third large species, and of the small ones, but by some pieces belonging to each, found in a single spot.

The first specimens of the fossil rhinoceros mentioned by writers were found in England, near Canterbury. They are described in the Philosophical Transactions, 1701. In the number were two teeth of the rhinoceros, which the author of the article believed to belong to the hippopotamus.

South of the Hartz, on the side of Hanover, were discovered in 1751 a number of remarkably large bones. They were first believed to belong to the elephant, but *Hollman* showed, by comparison with the descriptions of that animal then published, that this could not be the case. The description of the skull of the hippopotamus, given, in 1724, by Antoine de Jussieu, excluded this animal; and finally, Mickel having com-

pared one of the teeth with those of a living rhinoceros which he saw at Paris, immediately recognized the resemblance, and thus the genus was determined.

Pallas, in 1768, found in the fossil remains accumulated in the cabinet of St. Petersburg, four craniums and five horns of the rhinoceros. The most perfect of the four craniums was without the teeth.

Fifteen years after he published a relation of the astonishing discovery which he had made in Siberia of an *entire rhinoceros*, with the skin found buried in the sand on the banks of the Wiluji, in 64° north latitude. He adds the description of a much more perfect cranium than any of the former, found beyond the Lake Baikal. In many other parts of his travels he speaks of fossil remains of the same species.

There are not less of these bones found in Europe than in Siberia. Besides those already mentioned, Zuckert has published an account of some discovered at Quedlimbourg in 1728, in the same place where the pretended unicorn was discovered in 1663, of which Leibnitz speaks in his *Protogea*. This same unicorn, by the way, was spoken of before Leibnitz by Otto de Guericke, the celebrated inventor of the pneumatic machine. It was found in a calcareous and gypseous hill at one league distance to the south-east of Quedlimbourg. The bones had been in a great measure broken, until the time in which the remnants were collected and deposited in the abbatial palace. A sketch was then made of the animal, such as it was pretended to have been found entire in the quarry; but a glance is sufficient to show that this sketch was done by very ignorant hands, and taken after parts most incongruously joined together. The bones of the horse seemed to have formed a principal portion of the composition. The bones described by Zuckert, being a considerable portion of the muzzle, a portion of the humerus, a lower tooth, and an ungual phalanx, belong, doubtless, to the rhinoceros with bony partition of the nostrils.

In the country of Darmstadt, on the banks of the Rhine, were found a cranium, and several other bones, accompanied by many bones of the elephant and ox; another in the department of Worms; and a third by Prince Schwartzburg-Rudolstadt, at Cumbach; of all which Merck makes mention in his letters.

It would be quite inconsistent with our plan, and not very interesting to the reader, to particularize every place in Germany where such remains have been found. It appears that, as early as 1786, there had been fragments of at least twenty-two individuals found in that country; and since that period vast numbers of others have been found.

France has not furnished nearly as great a quantity of the remains of the rhinoceros as Germany, or perhaps those which have been discovered have not been so universally described. It will be sufficient, therefore, to observe, though considerable numbers have been discovered, that for the most part, teeth excepted, they were rather in a fragmentary state.

Italy, so abundant in fossils of all kinds, possesses the remains of the rhinoceros in immense quantities. They are found in the Vale of Arno, and most of them appertain to a second species distinct from that whose remains are most commonly to be found in Germany and Siberia. They principally abound in the Vale of the Upper Arno. They are found in the same strata as the bones of the elephant and hippopotamus, namely, in those clay and sand-hills which constitute, as it were, the first step of the mountains. They have also been found on this side the Apennine chain, but the most considerable and interesting discovery of these bones was made in 1805; by M. Cortesi of Plaçenza, on a hill parallel with Monte Pulgnasco, where he had also discovered an elephant.

The skeleton of the rhinoceros was about a mile from that of the elephant, and the gangue was the same, though at a much greater depth. There was over it at least two hundred feet of sand. An entire head was found there, ten vertebræ, fourteen ribs, two shoulder-blades entire, and two fore-legs, all

authenticated to have belonged to a species different from the Siberian.

M. Cortesi afterwards discovered two petrified humeri at some distance, and a lower jaw, in a state of great preservation, on the Monte Pulgnasco itself.

These bones, as well as the elephant's, are in strata filled with marine shells. The two last-mentioned humeri are replete with oysters, and, singular to relate, close to the lower jaw is found the radius of a whale. This would lead us to believe that a part of this stratum had been overturned, for the cetacea discovered by M. Cortesi were in other beds, and much deeper than the last-mentioned.

In our own country, the remains of the rhinoceros have been found in vast abundance: at Chatham, near Brentford, in the neighbourhood of Harwich, at Newham, near Rugby in Warwickshire, recently at Lawton in the same county, at Oreston, near Plymouth, in a cavern, (as we mentioned before) &c., all found in the same sort of loose strata, in the blue argilla or gravel; all which Professor Buckland designates as the diluvial detritus.

We may, in fact, conclude that the bones of the rhinoceros are found in almost every country where the bones of the elephant are found; that these two kinds of bones accompany each other, and are found with the bones of other large species; that almost always they are detected under the same circumstances; that their degree of preservation is similar; and that they have been placed by the same geological causes in the position in which they are found.

Without entering very minutely into osteological details, we shall simply mention that the fossil species are four in number: the first was originally called the rhinoceros of Pallas, from the circumstance of its having been first described by that celebrated writer. It is the fossil rhinoceros of Siberia, called by the Baron Cuvier, *rhinoceros tichorinus*. We have already noticed the fact of this animal having been found in the sand

on the banks of the Wiluji, nearly entire; the probability that these animals inhabited the places where their remains are found; that they were destroyed by the effect of some sudden revolution, or by some change of climate which prevented their further propagation. The long and thick fur with which they were clothed seems to prove that they might have inhabited a cold climate, though not one of the present temperature of Siberia.

This rhinoceros was of a considerably greater size than the two-horned species of Africa. Its head, extremely elongated, seems to have sustained two very long horns, the anterior of which was situated on a vast vault formed by the nasal bones, and consolidated by an osseous, vertical middle partition, which is wanting in the living species. There were no incisors in the jaws; the hair which covered the body was of a brown colour, and particularly abundant on the limbs; while the Indian and Cape rhinoceroses are totally deficient of hair in these parts. It would also appear that the head is not only absolutely much larger, but particularly so in proportion to the height of the limbs, and that the general form of the animal was much more low and compact than that of any living species.

So, then, it was owing to some peasants of Siberia that we happen to know this species of the ancient world, as exactly as we do those of our own times! With a little more precaution, the entire body might have been preserved, as well as the head and feet. Fortunate, however, it is, that the most essential parts of this ancient and singular monument have been saved from destruction.

The second species is the Baron's *rhinoceros leptorhinus*, called by other naturalists, in honour of its illustrious describer, *rhinoceros Cuvierii*. Its remains abound most in those parts of Italy above-mentioned. It had two horns on the nose, no incisors, nor were the nostrils partitioned, as in the last species. All these characters are peculiar to the bicorned rhinoceros of Africa. But the nostrils, in proportion, were much more

slender, and the bones of the nose analogously more minute. It appears to have been, generally, lighter, more elevated and less massive in the limbs than the species with partitioned nostrils, and to have had the head less elongated.

The third species is the rhinoceros with incisive teeth (*rhinoceros incisivus*). This rhinoceros is a species founded solely on the discovery of some incisive teeth in Germany by Camper. As neither the fossil rhinoceros with partitioned nostrils nor the rhinoceros leptorhinus could have such teeth, as their jaws afforded no lodgment for them, the Baron has assigned them to a third species; and though he has found no other bones which he can positively refer to it, he does not hesitate to inscribe it in the list of fossil animals.

The last fossil species of rhinoceros is the *minutus*, also provided with incisive teeth; but its size could not much have exceeded that of the hog, or one-third of that of the common rhinoceros. This species rests on some teeth and divers bones belonging to adult, and even old individuals, found in 1821 at St. Laurent, near the town of Moissac, in the department of Tarn and Garonne, nearly seventy feet deep, after having successively penetrated the vegetable earth, a strong and compact marl, a bed of gravel, a bed of sandstone, and many others of sand and gravel. The stratum containing these bones had the appearance of our common river-gravel, and also contained the bones of crocodiles and tortoises, and many debris of adult rhinoceroses, some of the ordinary size, and others two-thirds or one-half less.

The state of these bones has led the Baron to conclude that they may appertain to many different species, differing not only in size, but also in many other minute characters, which our present limits will not permit us to detail.

#### THE ELASMOTHERIUM.

The Elasmotherium is an extinct genus of the pachydermata, known unfortunately but by a single piece. M. Fischer, aulic

counsellor to the Emperor of Russia, observed among the presents made to the University of Moscow, (of which he was professor,) by the Princess Daschkaw, a portion of a jaw resembling that of the fossil rhinoceros, but presenting very peculiar characters. He soon perceived that it belonged to a different animal, and published an account of it at Moscow in 1808, and another in 1809.

The general disposition of this jaw is nearly the same as that of the fossil rhinoceros, and it has, likewise, in front, a prominent part without teeth, but not quite so long as in the rhinoceros. The branches where the teeth lay seemed more convex. The lower edge forms an almost uniformly elliptical curve, and does not form underneath a right line, and then an angle, on which the ascending branch rises almost perpendicularly, as in the rhinoceros. The coronoid apophyses seemed also less elevated, and the ascending branch goes more obliquely backward. The articular facet of the condyle is transverse, rather cylindrical, and a little wider at the external edge, nearly like the rhinoceros.

In this jaw were found four molar teeth, increasing in size from the first to the fourth, and the alveolus of a fifth was just visible. These teeth are prismatic, like those of the horse in his prime, and the bottom of their shaft not yet divided into roots. The length of their coronal is double its width.

What distinguishes the elasmotherium from all known animals is, that the laminæ of these teeth form a very elevated shaft, which grows like that of the horse, preserving a long time its prismatic form, and that they descend vertically through the entire extent of this shaft, not dividing into roots until after a considerable time, while, in other animals, they unite promptly into a single osseous body which is itself speedily divided into roots; and also that the plates of enamel are channelled over their entire elevation, and that their section has its edges festooned like those of the transversal bands of the molars of the Indian elephant.

These characters, whatever the age of the animal to whom this jaw belonged might have been, or whatever the complete number of teeth might have been in the animal's full development, clearly indicate a distinct genus, and also prove that its regimen was more exclusively graminivorous than that of the rhinoceros, and more resembled that of the horse and elephant. It is also extremely probable that it bore, in other respects, very strong relations to the rhinoceros and to the horse, and formed, perhaps, an intermediate link between these two genera. It appears to have been about the size of the former.

The enamel of the teeth is of a beautiful white and very hard. It strikes fire with steel. The osseous substance is yellow at the coronal, brown below. It effervesces with acids.

It is not known in what part of Siberia this precious relic of a former world was discovered.

#### HORSES.

On the fossil horses it would be useless to dilate. Their remains occur in a vast variety of places in the same strata with the bones we have been reviewing. This proves that they were contemporaneous with those extinct pachydermata; but nothing has as yet been observed respecting them, to indicate a distinct species from the existing. The Baron merely remarks that the bones are not as large as the bones of our large horses, but more approaching the size of those of the zebra, &c.

No well-authenticated remains of the *genus* of the swine have been found, except in the peat and other very recent strata, and of course not different from our present races.

#### THE GIGANTIC TAPIRS.

These are the first of a series of fossil animals which exhibited a strong affinity with the existing tapir in the transverse hillocks of a part of the molar teeth, and also in their general

structure. We shall not pursue the Baron in his extensive and luminous survey of the osteology of the daman and living tapirs, which, for his purpose, was a necessary introduction to the examination of the rest of the ancient fossil pachydermata, but would suit neither our plan nor limits. We shall proceed at once to these extinct animals, and endeavour to compress our comparisons within as brief a space as possible.

Remains of these gigantic tapirs have been found in a variety of places in the South of France. These remains, with the exception of a radius, consist entirely in molar teeth. These teeth exhibit the closest affinity to those of the existing tapirs in all their forms, but more especially in their transverse hillocks; but they were all of them of dimensions far surpassing those of the teeth of our living tapirs, and clearly indicating species of gigantic size. Still it would be necessary to find the incisors and canines to establish the complete resemblance of the dentition of these animals to the tapir. For, in truth, the tapir is not the only animal possessing the kind of teeth above described. The lamantin and kangaroo are in the same predicament. In the kangaroo, there are two hillocks, and even a line descending obliquely to the external edge, exactly resembling a germ of one of the tapiroidian teeth above mentioned. The kangaroo also has six molars in youth, and the first compressed and triangular. The lamantin has nine molars, the first of which only is triangular, the others are square, with two crenulated hillocks, just like the tapirs in question, and two heels, one before and one behind.

But the radius which I mentioned before, and which was found with some teeth at Carlat-le-Comte, a small town near the Pyrenees, was sufficient to determine the Baron to decide that the animal to which it belonged appertained to neither of the above genera. Its short and rounded form corresponded to no animal but the tapir, and its size bears a proportion to that of the teeth, nearly analogous to what is observed in living tapirs. Besides, the lamantin has this bone much more

triangular; and the bone in question, by its thickness, would indicate a lamantin of a size much too large to have the corresponding teeth; for, in the cetacea, all the parts of the superior extremity are greatly contracted. To bring the radius of the kangaroo into the question would be absurd, the slender forms of which are so totally different.

Every observation, then, concurs to approximate the animals to whom these remains belonged to tapirs; and until it is proved that the incisive and canine teeth do not correspond with those of this genus, they must be referred to it.

The Baron uses the name, *gigantic tapirs*, in the plural number, inasmuch as he observed sufficient discrepancy in size in some of the teeth to warrant him in supposing that there might have been more than one species. That species to which certain of the larger teeth belonged, judging by comparison with living tapirs, especially with that of India, he thinks might have been eighteen feet long and eleven feet high, equal in size to the largest elephants and to the great mastodon of America. The other individuals, whose teeth were discovered at Carlat and Cheville, might have been somewhat less, but most certainly were very formidable animals.

It appears that these gigantic tapirs belonged to the same era as the fossil elephants and mastodons; that they lived with them, and were destroyed by the same catastrophe: their bones are found in the same strata, and sometimes mingled with the others. M. Lockhart observes, that at Avary these bones were found beyond the valley of the Loire, not inclosed in the regular rocky strata; they were in a bed of sand, immediately supported by a calcareous fresh-water formation. This bed is formed of a very variegated sand, composed of small calcareous fragments and rolled quartz, of different sizes and colours. This bed is surmounted by the stratum of vegetable earth.

## THE LOPHIODON.

We now arrive at those numerous ancient pachydermata, whose remains are concealed in the bosom of the earth, and which differ more or less from all genera existing at the present day. Accordingly, we find ourselves approaching the deeper strata, those more completely covered by marine formations, and which seem to appertain to eras more remote than those in which the animals we have hitherto been surveying existed.

The species which constitute the genus lophiodon are not, however, so widely removed from the tapirs, though, for the sake of precision, the Baron has separated them. Like the tapirs, they have six incisors and two canines in each jaw, and the greater number of their molars exhibit the same transverse hillocks. But in the first upper molars there are not two of these, but one. In all, the hillocks are more oblique, and the base of the teeth, especially of the last ones, is less rectangular; the molars have three hillocks, instead of two. The anterior have hillocks much more unequal; finally, in some species, these more oblique and arched hillocks approach the crescented form peculiar to the daman and rhinoceros, and thus conduct us by degrees to that most extraordinary genus, the palæotherium.

The remains of the lophiodon have been found in such numbers and variety, and in so many different places, that our readers must pardon us if we do not enter very minutely into their geographical localities, and other circumstances under which they were discovered. They have been found abundantly at Issel, a village in France, along the declivities of the Black Mountain, in the department of the Aude; near Argenton, in the department of the Indre; near Buchweiler, department of the Lower Rhine; along the eastern declivities of the Vosges mountains; at Soissons, Orleans, the Laonnois, and the Vale of Arno.

The generic characters of the lophiodons are as follow :—

Six incisors and two canines in each jaw ; seven molars in each side in the upper jaw, and six in the lower, with an empty space between the canine and the first molar, points in which they resemble the tapirs.

A third hillock to the last lower molar. This is wanting in the tapirs.

The anterior lower molars are not provided with transverse hillocks, as in the tapirs, but exhibit either a longitudinal series of tubercles, or one isolated conical tubercle.

The upper molars have their transverse hillocks more oblique, and in this respect resemble those of the rhinoceros, from which, however, they differ in the absence of crotchets on these same hillocks.

The rest of the osteology of the lophiodon, as far as it is known, exhibits close relations with the tapirs, the rhinoceros, and sometimes with the hippopotamus. But it must be remarked, that many essential points of this osteology are yet unknown, particularly the number of toes on each foot, and the form of the nasal bones.

There are twelve species of the lophiodon pretty well determined ; three found at Issel, the largest of which was again found at Argenton ; three other species at Argenton, altogether distinct from the former ; two species at Buchweiler ; one of Montpellier ; two of Montabusard near Orleans, the largest of which was of gigantic size, being calculated by the Baron to have been nine feet (French) in length ; and one in the Laonnois. Besides which there was a humerus found in the last-mentioned place, and a pelvis in the Vale of Arno, which M. Cuvier as yet regards as doubtful.

The most important point relative to these animals is connected with the theory of the earth. Their debris, wherever it has been possible to authenticate their localities, are enveloped in rocks or earths, exclusively filled with shells of the fresh water, and which, consequently, have been deposited in

fresh water. The animals whose debris are found with theirs, are either terrestrial animals, and, like them, unknown; or crocodiles, trionyces, and emydes, the genera of which inhabit the fresh water at the present day in the torrid zone. Finally, in many situations well determined, these strata are again covered by strata of an origin indubitably marine. Consequently, we find this genus of the lophiodon closely united to those of the palæotheria and anaplotheria, and other unknown genera yet to be described, and which demonstrate the certainty of an anterior state of animal creation, which occupied the surface of our present continents, and which an irruption of the sea overwhelmed, and covered again their debris with rocks of a new origin.

Previously to entering on any account of those more ancient races, for whose discovery and description we are exclusively indebted to M. Cuvier, it may be as well to take a retrospective glance at what we have already done, and present the reader with a short recapitulation of this portion of the subject.

We find, then, that, in the loose or ancient alluvial strata, by Dr. Buckland called *diluvial*, those depositions which fill the bottom of our vallies, and cover the superficies of our continents, there have been discovered, in the order of the pachydermata alone, the remains of seventeen or eighteen species: one elephant, six mastodons, three, or perhaps four, hippopotami, as many rhinoceroses, an elasmotherium, one species perhaps of the horse, and, at all events, one gigantic tapir.

Of all these animals, the horse is the only species that has not been clearly proved to be absolutely foreign to the climates where these remains are found.

The mastodons constitute a genus by themselves now unknown, but very much approximating to the elephant. The elasmotherium is also most assuredly a separate and extinct genus. All the others belong to genera now existing in the torrid zone exclusively. Four of these genera, the elephant, hippopotamus, rhinoceros, and horse, are found only in the

Old World. The fifth, that of the tapirs, is the only one existing in the two continents at the present day. It is only in the old continent that the bones of the tapir, the rhinoceros, and hippopotamus have been found. In the new have been discovered some bones of the elephant; the mastodon, in one species, is common to both.

The species belonging to known genera are distinct from the existing species, and cannot be considered as simple varieties. This point is beyond the shadow of a doubt, as regards the little hippopotamus, the little rhinoceros, the rhinoceros with partitioned nostrils, and the gigantic tapir. It is not quite so obvious in the case of the elephant and the other rhinoceros, but there are more than sufficient reasons to convince the experienced anatomist of the fact. The same conclusion must be extended to the great fossil hippopotamus, and, by analogy, to the fossil horses, although their remains have not yet furnished the clearest evidence of specific distinction.

Such may be considered the osteological result of the researches that have been made on the fossil pachydermata; the geological consequences are these:—

The different remains of which we have been treating, are all embedded in depositions nearly similar. They are often found in company with the bones of other animals pretty similar to those which exist at present. These depositions are, for the most part, loose and incompact, whether composed of sandy or marly substances, and always more or less approximating to the surface of the soil.

It seems probable from this, that these bones were enveloped by the last, or one of the latest, revolutions of this globe.

In a very great number of situations they are accompanied with the accumulated debris of marine animals; in others these debris are wanting, and, in some places, the sand or marl enveloping the bones contains only fresh-water shells.

It does not appear, from any account worthy of the slightest credence, that they are ever covered by the regular rocky

strata, which are filled with marine shells. The consequence deduced from this is, that the sea did not rest upon them for any length of time, and that the catastrophe which overwhelmed them was a grand, but transitory, marine inundation.

It is the opinion of the Baron, as we noticed before in treating of the elephant, that this inundation did not rise above the higher mountain ranges. Strata analogous to those covering the fossil remains in question, he declares are not to be found in such situations, nor yet the fossil remains, not even in the more elevated vallies, except in some parts of South America. It is proper to remark that this opinion has been controverted by Dr. Buckland, to whose work we must content ourselves with referring the reader, without presuming to decide upon the question.

The bones are generally neither rolled, nor are the skeletons found perfect; they are most usually scattered in disorder, and partly fractured. This proves that they were brought from no great distance by the inundation; that they were found by it in the places where they are disinterred; and that the animals to which they belonged must have existed in those places. In a few instances, as we have seen, the skeletons were discovered perfect, and even invested with the softer parts, which proves the suddenness with which, in those instances, they were overwhelmed.

Previously to the catastrophe in question these animals, then, lived in the climates where their bones are disinterred. This catastrophe covered with new strata the bones which it found scattered on the surface of the soil. It destroyed and buried the individuals which it found existing; and as the same species are no longer any where observed, it follows, as a necessary consequence, that their races were totally annihilated.

Species of genera peculiar to the torrid zone, existed once in the northern climates; but it by no means follows, that the species now existing in the torrid zone descended from these ancient animals, gradually or suddenly transported towards

the equator. They are not all the same, and no well authenticated fact authorises us to believe that such transformations ever take place, more especially in wild animals. Neither is there any decided proof that the temperature of the northern climates has changed very materially, since the era in which those animals existed. The fossil species do not differ less from the living, than certain existing animals of the north differ from their congeners of the south. There is even proof that some of them were destined to inhabit a cold climate, from their having had, like all northern animals, two sorts of hair, and a wool next the skin.

All these results, which hold good respecting the animal remains discovered in the ancient alluvial strata, will not apply to the lophiodons. Most part of their remains, perhaps all, appertain to rocky strata of more ancient date. They form, too, a connecting link between the tapirs and those more extraordinary and ancient pachydermata, which it now becomes our business to describe.

#### CUVIERIAN FOSSIL PACHYDERMATA.

Under this general title we shall describe the remaining extinct genera of this order, characterizing them by the name of their illustrious and indefatigable describer, to whom all our knowledge of them is exclusively due. In doing so, we only mean to offer a small tribute of respect to one, to whose laborious researches, and invaluable services to the cause of science, no language of ours can render adequate justice.

The Baron declares, that when his attention was originally drawn to the subject of fossil osteology, by the accidental view of the remains of the elephant and bear, and the idea suggested itself of applying the general rules of comparative anatomy to the reconstruction and determination of the fossil species, he had little notion that he was then treading on a soil replete with relics of a far more extraordinary description than any he had hitherto witnessed. He little imagined that his labours were

destined to bring to light so many entire genera of animals, all utterly extinct and buried for myriads of ages in the bosom of the earth. He had even paid no attention to the partial accounts given of these remains, in the environs of Paris, by certain naturalists, who did not even pretend to determine the species, or seem to have suspected that there was any thing singular about them. Guettard had simply announced their existence; Pralon described the strata of Montmartre in a summary way, and spoke generally of the bones therein contained; Lamanon gave a partial account of a few bones, as did likewise Pazumot. This constituted the amount of all that had been done concerning them, previously to the commencement of our author's researches.

His attention was first directed to them by M. Vuarin, who presented him with a few specimens, which not a little excited his astonishment. He immediately obtained access to the collections of several gentlemen, and every relic he met with there of these bones, excited his curiosity more and more, and determined him to proceed in his inquiries. He finally set about forming a collection himself from the plaster quarries of Paris, and by his liberality to the workmen, and indefatigable zeal, he soon succeeded in accumulating an immense quantity of materials on which to commence his operations.

It was more easy, however, to collect the materials than to arrange them—more easy to accumulate the bones, than reconstruct the skeletons, which was yet the only means by which a just idea could be formed of the species. From the first he perceived that the species whose remains were found in the gypsum were considerably numerous. Soon after he discovered that they appertained to different genera, and that the species of the different genera were often of the same size, so that the relative magnitude would prove rather a source of embarrassment than of assistance. He had in his possession the mutilated and incomplete remains of some hundreds of skeletons, all mixed and confused together, and it was absolutely necessary that

each bone should be placed with those to which it naturally corresponded, before any satisfactory result could be obtained—a task the stupendous difficulty of which the reader can easily appreciate. It was necessary, (to use the eloquent language of the Baron himself) that a sort of resurrection in miniature should take place; and he had not at his disposal the all-powerful trumpet, at whose sound the scattered fragments should re-unite, and each resume its proper place. But stupendous as was this task, it was yet accomplished. On the immutable laws prescribed by nature to living beings, he reconstructed those ancient animals, and the voice of comparative anatomy was the trumpet of this scientific resurrection. He has no language, he says, to depict the pleasure he experienced, as he observed, on the discovery of each peculiar character, the consequences which he had predicted from it develop themselves in gradual succession. Thus, for example, the feet corresponded with the peculiarities announced by the teeth, and the teeth with those indicated by the feet. The bones of the legs, thighs, &c., all proved conformable to the judgment he had formed beforehand, from the consideration of other parts. Each species, in fact, seemed, as it were, to be reproduced from a single one of its component elements.

The Baron enters into a very minute and detailed account of the steps which he was obliged to pursue, in the restoration of these monuments of a former age. This, indubitably, is the only plan for enabling the reader thoroughly to appreciate the difficulty, extent, and value of his labours. By this means, too, we are put in possession of the strongest demonstrations of the truth and justice of those principles which conducted him to his conclusions. This part of his work contains a multiplication of examples of the precision with which nature in all cases observes the laws of co-existence, and is of inestimable value to the natural historian. Such are the researches which have raised zoology to the rank of a rational science—which have banished from it those absurd and arbitrary combinations,

dignified with the title of systems, and based it on the natural and necessary relations which link together the various parts of all organized bodies.

These researches, also, led to geological conclusions of vast importance. They proved that the sea had covered, for a long period, all that country in the neighbourhood of the French metropolis, and tranquilly deposited there a variety of different kinds of strata: it then abandoned it to the fresh water, which then expanded over the soil in vast lakes. In these lakes were found the gypsum and the marly strata alternating with it, or immediately covering it. The peculiar animals, with whose bones this gypsum is replete, lived on the banks, or in the islands of these lakes, swam in their waters, and fell in there when they died. At a more recent era the sea re-occupied its ancient domain, and deposited sand and marl, filled with shells. Finally, after its last retreat, the surface of the soil, as well in its elevations as its vallies, was again, for a long period, covered with ponds or marshes, which have left thick strata of stone, abounding with shells of the fresh-water.

This peculiar stone of fresh-water formation, neglected or unknown by geologists, is one of the most remarkable results of the Baron's labours. Its existence has since been ascertained in almost every part of France, but its alternation with the marine strata is no where so evident as in the neighbourhood of Paris.

When animals approximating to those of the Parisian environs are found elsewhere, they are invariably in a stratum of fresh-water formation, but not always in the gypsum. The calcareous depositions of Orleans and Buchsweiler, which contain such remains, also contain abundance of lacustral shells; and those of Buchsweiler are covered, like the gypsum of Paris, with marine coquillaceous strata. This parity of phenomena proves the vast extent of the catastrophes which produced them.

It may be as well, before we enter on any specific notice of

these ancient animals, to say a word on the peculiar state in which their bones were found in the gypsum-quarries.

They were either entire or broken, according to the degree of resistance which they opposed to the pressure of the strata resting on them. The bones of the carpus and tarsus, whose interior is solid, were generally found entire, except in cases where they must have been mutilated previously to incrustation. The femora, the tibiæ, and the other long and hollow bones, more especially those belonging to the larger species, were seldom entire, except in the extremities, which are solid. The skulls were generally broken or crushed, or but one half of them frequently found. As for the skeletons, those of the very small animals were almost always entire, having the ribs and frequently the bones of both their sides. In the animals of middle size, the ribs of one side alone were to be found, and the skeletons of the very large species were almost always disunited. The reason of this appears to be that a longer time was necessary to incrust them with a coat of plaster of sufficient thickness, while a small animal might be incrustated before the tendons were rotten and the bones detached. When the animal was a little large, and resting on one side, the uppermost ribs had time to detach themselves from the skeleton, while the under ones were in a process of incrustation. These bones are scarcely ever worn or rolled, which sufficiently proves that they were carried from no great distance. They were occasionally fractured, and sometimes evidently gnawed, previously to being incrustated, which proves that carnivorous animals existed contemporaneously with the herbivora in question. Nor are they found in a state of petrification, but simply fossil, and still preserving, after so many ages, a portion of their animal substance. On analysis they were found to contain sixty-five parts phosphate of lime, eighteen sulphate of lime, and seven carbonate of lime, and they still had a portion of gelatine, as they were blackened by the action of fire.

It is astonishing that, in a country of such extent as that

occupied by the plaster-quarries, more than twenty leagues from east to west, that scarcely any bones but those belonging to a single family should be found. The remains of the small number of species different from this family discovered there, are rare in the extreme. It is not to be doubted that the number of bones of each species found in the fossil state, bears a relative proportion to the number of animals which once existed on the soil, for it is impossible to imagine any destructive agency, that could have overwhelmed or incrustrated in the gypsum, the bones of any one species in preference to those of another.

In the present state of the globe we find animals of almost all families inhabiting the countries which compose all our large continents, according to the degree of latitude, and the nature of the soil. But this is not at all the case with the larger islands of the earth. The actual state of New Holland, in particular, may serve to illustrate the probable state of that part of France which was once inhabited by these ancient pachydermata. Five-sixths of the quadrupeds of that island belong to one and the same family, namely, the marsupialia. There are six genera of these approximating very closely to each other, and having nothing analogous in the animal world, except the didelphes of the warmer regions of America. To these we may add the ornithorhynchus and echidna, which exhibit close relations to the pouched animals. The number of species in these genera are more than forty, and there are but eight or ten species of other mammalia to oppose to them in the whole country.

Here, then, we find in a considerable, but isolated, region, a proportion in the number of its quadrupeds very similar to what appears to have obtained formerly in the country inhabited by those ancient animals. Among a dozen or fifteen pachydermata, we find but two or three carnivora. This resemblance has led the Baron to conjecture, that, at the era in which those animals lived, the country which they occupied

was environed on all sides by the sea, and that, like all the greater islands, it possessed its own peculiar population. This even holds good with respect to its vegetation: for the debris only of plants now unknown in Europe are found in the strata of which we are speaking.

The Baron, in his grand work on the "Ossemens Fossiles," first gives a geological survey of the environs of Paris, and then a very detailed account of the steps which he pursued in restoring the skeletons of the ancient animals. It would be utterly out of the question for us to attempt to follow him in this narrative of his amazing labours. We must limit ourselves to giving the results in as brief a space as possible.

Of the fossil quadrupeds, whose remains were found in the plaster-quarries, M. Cuvier has formed two distinct genera under the names of *PALÆOTHERIUM* and *ANOPLOTHERIUM*. The first approximates to the tapirs, in the number and disposition of the teeth, and more particularly in the conformation of the nasal bones. The second is peculiarly remarkable in not having the canine teeth projecting, and in all the teeth forming a continuous series, in the same manner as in the human species.

Two species only of the palæotherium furnished a sufficient quantity of bones, to enable the Baron pretty nearly to reconstruct their skeletons entire, and, consequently, to draw conclusions respecting the forms of these skeletons, respecting those of the soft parts, and to advance some probable conjectures respecting the mode of living of these animals. The greatest number of the other species have only been recognised by portions, more or less considerable, of heads furnished with teeth, or by certain bones of the extremities. The reality, however, of these species is rendered incontestable, by the differences which their debris exhibit, when compared with those of the two restored species.

The bones of the first species of the palæotherium were found, as we said, in the Parisian calcareous gypsum. Since then, other species of the same genus have been found in several

parts of France, as well as in the different strata in the neighbourhood of the metropolis.

The characters of the genus *palæotherium* may be thus described: Six incisors in each jaw, ranged in one and the same line, angular, and tolerably strong; four canines, one in each side in each jaw, conical, and so distant as to cross each other when the mouth was closed; seven molars on the right and left in each jaw, the upper of a square form, with four roots and three crests on the external side, leaving between them two channels—they have a furrow on the internal side; their coronal, pretty analogous to that of the upper molars of the rhinoceros and daman, presents, on its external edge, a sort of projecting figure, in the form of a W, to which are united internally two oblique hillocks, proceeding to the two extremities of the W, leaving between them a valley, also oblique, and the entire base of the tooth is surrounded by a cincture. The lower molars show their enamelled outlines in the form of a double crescent, *i. e.*, two crescents, one at the end of the other, more or less oblique. The general form of the head is like that of the tapirs; the nasal bones are very short and slender, jutting out only on the lower part of the nasal aperture, and very probably having formed a point of attachment for the muscles of a small and mobile proboscis. The orbital and temporal foramina were separated above by a well-marked projection, and the first was very small, and less elevated than the second, proving that the eye must have been small, and situated low. The zygomatic arches rather projected. The cranium was very narrow at the elevation of the temporal foramina, which are enormously large. The glenoid cavity is level, as in the tapirs. The meatus auditorius very small, and not elevated, whence M. Cuvier concludes that the ear was attached very low down. The occipital facet was very small, and the crests of the occiput strongly projecting. Ribs (in one species, *Pal. Minus*) true and false, fifteen pair; extremities slightly elevated; cubitus distinct from the radius; peroneum distinct from the tibia; three toes

on each foot, the middle one the largest, the two others nearly equal; tail of a moderate length.

The palæotheria in the environs of Paris, says the Baron, do not differ either in teeth or number of toes. It is almost impossible to characterize them otherwise than by size. But among those which have been found elsewhere there are general characters of conformation sufficient for distinction.

The Parisian species are seven in number.

*The Great Palæotherium (Pal. Magnum.)*—This animal was of the size of the horse. The head and feet have been restored, but the trunk is in a great measure wanting. Of this species, of which the Baron has given a figure with the external forms he attributes to it, it is easy to form a conception. We need only imagine a tapir of the size of a horse, with some differences in the teeth, and a toe less on the fore-feet. Arguing from analogy, the hair should have been close and smooth, or, perhaps, in no greater quantity than it is on the elephant or tapir. It was more than four feet and a half in height to the wither, just the height of the rhinoceros of Java. It was more squat in its proportions and general figure than the horse. The head was more massive, and the extremities thicker and shorter.

*The middle-sized Palæotherium (Pal. Medium)*, was almost the size of a hog. The feet were rather long and slender; the bones of the nose were shorter, from which the Baron conjectures that the proboscis was more long and mobile than in the following species. It resembled a tapir with slender limbs, and might have been, in its own genus, something analogous to what the babyroussa is among the swine. The height to the wither might have been thirty-one or thirty-two inches. In addition to the remains of the head were found the cubitus, the radius, the fore-foot, the tibia, and the hind-foot.

*The thick-footed Palæotherium (Pal. crassum.)*—This species, of the same size with the last, had the feet shorter and

thicker in proportion. It might have been about thirty inches in height, and of all the fossil animals of the Parisian gypsum most resembled the tapir in its conformation, though inferior in size. Of this species there is a head in very great preservation, and the superior and inferior extremities.

*The broad-footed Palæotherium (Pal. Latum.)*—The forearm and the feet alone were found of this animal, which in general conformation seemed exactly opposed to *Pal. Medium*. From the shortness and breadth of its extremities, the Baron judges that it must have been singularly slow and clumsy in its movements. It appeared to hold a similar place in this family with the phascalome among the marsupialia. It was probably not more than from four-and-twenty to six-and-twenty inches in height, but its proportions were as large, and its members as thick, as those of the preceding species.

*The short Palæotherium (Pal. Curtum.)*—M. Cuvier collected of this species only the head and some portions of the feet, by which he judges that it very much resembled the *palæotherium latum*, but was considerably smaller, not being larger than a sheep.

*The small Palæotherium (Pal. Minus)* was found almost complete at Pantin, and many lower jaws and feet referable to it were found elsewhere. The pelvis, the sacrum, and the tail remained incomplete, and also the top of the head. But the form of the last may be well presumed from the heads of the other species. "Could this animal," says M. Cuvier, "be as easily re-animated as its bones have been collected, we should behold a tapir smaller than the roe-buck, with light and slender limbs, for such, to a certainty, was the figure of the animal."

*The very small Palæotherium (Pal. Minimum)* was only about the size of a hare, and had very small and slight feet. Nothing has been found of it but some bones of the extremities.

A fragment of the lower-jaw of the palæotherium, furnished with teeth, was found at Puy, in Velay, in a gypsous stratum, by M. Bertrand-Roux. But this single fragment was not

sufficient to convince the Baron of the identity of this palæotherium with any of those of the Parisian environs. He rather inclines to believe it distinct. In the environs of Montabussard, near Orleans, where, as we have mentioned, the bones of lophiodons were found, were also found two species of the palæotherium, different from those of Paris. One must have been rather smaller than the *palæotherium crassum*. Some other debris, apparently of this species, were found near St. Geniez, three leagues from Montpellier. A fragment of a left lower-jaw, containing the four last molars, was found at more than thirty feet deep, in a coquillaceous, hard, and compact stone, which M. Cuvier supposes to be of fresh-water formation. Lastly, in the declivities of the Black Mountain, near Issel, were also contained the bones of a palæotherium, extremely similar to that of Orleans, and it is not improbable that some debris found in this last place are referable to the species of Issel.

These species have been called by the Baron, *Pal. Velaunum*, *Pal. Aurelianense*, and *Pal. Isselanum*. The two last differ principally from the others by the lower molars having their intermediate re-entering angle divided in two at its summit.

The ANOPLOTHERIA, up to the time in which the Baron's last edition was published, were found only in the plaster-quarries of Paris. We have noticed, in a preceding part of this article, some subsequent detections of them. They have two characters not observable in any other animal: feet with two toes, in which the bones of the metacarpus and metatarsus remain distinct, and are not soldered together as in the ruminantia, and teeth in a continued series, without any intervening gap. Man alone possesses teeth of this description, whose contiguity is uninterrupted by any vacant interval. The anoplotheria have six incisors in each jaw, one canine and seven molars, on each side, as well above as below. The canines are short, and similar to the outer incisors. The three first molars are compressed, the four others in the upper-jaw are squared, with

transverse crests, and a small cone between them. In the lower they are formed into a double crescent, but without collar, or neck, at the base. The last has three crescents. The head is of an oblong form, and does not indicate the existence of a proboscis. The composition of the tarsus is the same as in the camel.

This extraordinary genus, to which there is nothing analogous in existing nature, is subdivided by the Baron into three subgenera: the ANOPLOTHERIA, properly so called, in which the anterior molars are tolerably thick, and the hinder ones in the lower-jaw have their crescents with a simple crest; the XIPHODONS, in which the anterior molars are slender and trenchant, and the hinder ones below have, opposite the concavity of each of their crescents, a point which, in the course of wear, also takes the form of a crescent, so that then the crescents are double, as in the ruminants; and the DICHOBUNES, whose exterior crescents are also pointed in the commencement, and which have, on their back-molars in the lower-jaw, points arranged in pairs.

The *Anoplotherium commune*, so called from its remains being the most usually found, was an animal about the height of a wild boar, but much more elongated in form, and bearing a very long and thick tail. Its proportions much resembled those of the otter, but on a larger scale. It seems probable that it swam well, and frequented the lakes, in the bottom of which its bones have been incrustated by the gypsum there deposited. There is another, a little smaller, but in other respects similar to the last, and called by the Baron, *An. Secundarium*.

As yet but one xiphodon is known. This the Baron formerly called *An. Medium*, but has finally given it the epithet of *An. Gracile*, from the peculiar elegance of its proportions. It was a remarkable animal, of the size and form of the gazelle. The lightness of its form causes M. Cuvier to conjecture that this species lived after the manner of the deer and antelopes;

that its senses were analogous to theirs, and that it was covered with hairs somewhat similar to those ruminants.

There is one dichobune pretty nearly the size of the hare, and named *An. Leporinum*. Besides its subgeneric characters, it differs from the anoplotheria and xiphodons in having two small and slender toes on each foot, at the sides of the two great toes. It is not ascertained whether these two lateral toes exist or not in the two other dichobunes. They must have been very small species, and scarcely larger than the *aperea*.

Another genus of the pachydermata, found in the gypsum of Paris, is the *CHÆROPOTAMUS*. This is known only by the teeth and some parts of the head. The incisors, if there were any, are lost. The lower canine is pointed, and tolerably large. Between it and the first molar is an empty space. This molar is conical, pointed, and slightly compressed, but by no means trenchant, and has two thick roots, which separate as they sink into the alveolus. The second is rather more compressed, and has also two roots; and behind its point, which is blunt, are other points, much lower, and scarcely projecting, which form a second lobe. Then come two teeth, which are tuberculous. There are four principal tubercles on the coronal, which is nearly rectangular. In the middle of these tubercles are two smaller ones, and there are some other inequalities about their bases. They resemble the third and fourth molars of the babyroussa, and these teeth, in general, seem to indicate an animal of the swine family. But no known swine has the first molar of this conical form, and the pehari alone has a canine so small as the chæropotamus, and is, besides, a smaller animal than the individual to whom the teeth we have been describing belonged.

From these and some other fragments, the Baron concludes, that the plaster-quarries inclose the remains of an animal more approximating to the genus *porcus*, than the *anoplotherium* or *palseotherium*, and which did not yet resemble precisely the living swine. He suspects that the dichobunes, whose feet so

much resembled those of the swine, approached very near this new genus, and, perhaps, formed the link between it and the anoplotheria proper.

The *ADAPIS* is another of these extraordinary and numerous genera. It is only known by some debris of the head. Its general form appears to have been something like that of the hedgehog, but a third larger. Four incisors were discovered, trenchant, and rather oblique, like those of the anoplotherium; then, above and below, a conical canine, thicker and rather more projecting than the other teeth; the upper one a straight cone, the lower oblique, and couched forwards; the alveolus of the upper was very deep. The molars appear to have been seven in number in each. Six were discovered in the upper jaw, the first trenchant, the second surrounded by a crest, the third apparently so; the fourth and two last were like the hinder molars of the anoplotherium. In the lower jaw, the two first molars are pointed and trenchant, the third similar, but longer and wider; the three following were wanting in the lower jaw discovered. The last is oblong, and seems to have had the tubercles in the form of unequal transverse hillocks. The animal might have been about the size of a rabbit, and approximated to the anoplotherium.

The last of these extinct pachydermata is the *ANTEACOTHERIUM*. Of this genus two species were discovered in the lignites of Liguria, at Cadibona, near Savone, and a third in the fresh-water formation of the environs of Agen. It is impossible for us to follow the Baron through his account of these discoveries and of their osteology. The jaw-teeth exhibited considerable analogies with those of the chæropotamus and the dichobunes. But besides that these molars presented of themselves specific distinctions, the large and projecting canines with which they were accompanied, left no doubt of the existence of a new and distinct genus. The first species approached to the size of the rhinoceros, the second was considerably smaller, and the third rests upon the fragment of a jaw found in the

department of Lot-et-Garonne which exhibited certain peculiarities.

The genus *antracotherium*, according to the Baron, held an intermediate place between the *palæotheria*, *anoplotheria*, and swine.

This is the place to observe on a very striking fact, which the study of the fossils has served to explain. It was an old observation of the Baron's, that the order of the *pachydermata*, less abounding in genera than other orders, and in which the genera are less naturally connected together, must have suffered losses to which those intervals that interrupt its series are owing. Accordingly, we find the fossil remains of this order in the most immense abundance, developing new and singular forms to our observation. The living species bear no sort of proportion to the lost. Those shades which approximate genera to each other, those intermediate forms, those steps from one genus to another, so common in the other families of the animal kingdom, are wanting here. It was reserved for the science of fossil osteology to recover them from the entrails of the earth, among the races which completed the grand system of animated nature, and whose destruction has produced such wide and striking intervals. Thus we see that, without the study of the fossils, zoology itself must have remained an imperfect science, and the laws of inter-approximation, on which natural methods are founded, must have still wanted the most complete and satisfactory evidence of their truth.

#### FOSSIL RUMINANTIA.

As the species of *ruminantia* which occur in the fossil state have been already so accurately described by Major Smith, in that department of the "Animal Kingdom," the reader must excuse me for confining myself altogether to general observations on this part of my subject.

The remains of the *ruminantia* are excessively abundant

among the fossils, but their study involves a world of difficulty, both in an osteological and a geological point of view. Among the living ruminants, the species are by no means easily to be distinguished; for in this family, though so strongly separated from all others, the inter-resemblance of its members is so great, that naturalists have been forced to adopt parts of comparatively little importance as generic characters: the horns, for instance, an external character, variable in the same species, according to sex, age, and climate, in form and in size, and even under many of these circumstances totally wanting.

It is easy, then, to conceive how difficult it is to pronounce whether any isolated specimen belongs to an existing species or not. If horns, their nuclei, or the frontal bone be wanting, our judgments are always liable to doubt and uncertainty.

The fossil ruminantia are found in the depositions of many different eras. The Baron, indeed, states that he discovered no remains of this kind in the gypsum of Paris, with the ancient pachydermata there incrustated. But they are coeval with the lophiodons, in the calcareous fresh-water formation of Orleans, which also incloses the debris of palæotheria. They become exceedingly numerous in the extensive ancient alluvial strata where the elephant and rhinoceros are found, even as numerous as the bones of horses. The caverns which are filled with the osseous remains of carnivora also contain, at times, the debris of ruminants. Finally, where they most particularly abound is in those apertures which traverse certain mountains in the south of Europe, and which are filled with what we have already described as the osseous breccia.

The ruminants, then, were clearly coeval with the other mammifera of the ancient world; and they existed in a numerical proportion sufficiently great to produce an abundance of their bones in various depositions. But this, which holds true of the order, does not apply to all the genera which compose it. The bones of many species of the deer and ox are found abundantly among the fossils. But as for the bones of

sheep, goats, antelopes, camelopards, camels, &c., the Baron declares, that in his researches he has been able to meet with none. He does not say that, among such abundance of fragments, there may not be some isolated piece belonging to one of these genera, because from such pieces a genus cannot be determined; but he asserts that, in the course of twenty years of constant research, both by himself and others, no frontal bone, no nucleus of horn, no front part of the jaw, no occiput, in short, no bone characteristic of one of these genera has been discovered. This could never have happened, had they been but a tenth part as numerous among the fossils as the deer or oxen.

Pallas, indeed, mentions the horn of the antelope among the Siberian fossils in the academy of St. Petersburg; and at the British Museum, Camper took a drawing of a fragment of the lower-jaw, which he judged to belong to the camel. But there is no authentic testimony that these were genuine fossils, and most probably they got into these respective collections by some mistake.

There is nothing in the actual state of the globe which can explain the absence of these genera among the fossils. Climate will not do it: for the antelopes, like the elephant and rhinoceros, are the natives of warm countries; and the mouflon, the chamois, and the wild goat, like the ox and deer, are inhabitants of the north. Nor is it difference of size, for there are antelopes superior in stature to the stag, and the wild goat and the mouflon are larger than the fossil roebuck; to say nothing of the diminutive rodentia and insectivora, whose littleness did not prevent their detection.

Amongst all these singularities, there is a fact perhaps still more singular than the rest. The fossil ruminants appertain precisely to the genera and sub-genera at present most common in the northern climates; to the aurochs, the musk-ox, the elk, and the rein-deer: while the fossil pachydermata, the elephant, the rhinoceros, the hippopotamus, and the tapir, are limited at present to the torrid zone.

In the loose strata the remains of six species of deer are found, one of which at least, namely, that with gigantic antlers, has totally disappeared from the face of the earth. In the osseous breccia are four others, three of which exist no longer, at least in our climates, and bear no analogy to any of the tribe at present in existence, except the deer of countries far remote from ours.

The regular rocky strata, which inclose the most ancient pachydermata, have also furnished us with one species of deer, that of Orleans. It is entirely unknown at the present day, and may be said even to exhibit characters of almost generic distinction.

We also find the distribution of this genus in the different strata regulated by the same laws as that of the pachydermata. There is a most important observation of the Baron's connected with this subject; and that is, that if the fossil rein-deer was of the same species as the existing, or had the same habits, its co-existence with the rhinoceros in the cavern of Breuges, and with the mastodon near Etampes, renders more and more probable the opinion that these large pachydermata inhabited the countries where their remains have been found. It also proves that these countries can have undergone no very great change of temperature.

A similar observation is applicable to the remains of the ox, which also accompany those of the elephant. It is clearly proved that this genus existed coevally with the pachydermata of the ancient alluvion. It appears that there were at least two species, one with slender limbs, resembling the auroch, another with more massive members, like the domestic ox, or the buffalo. Craniums have been found of the former, and other bones, in various localities, which the Baron is inclined to refer to the same source; but as the bones and craniums were not found together, it is impossible to speak with absolute certainty on this correspondence. It is also to be observed, that the distinction between these said crania and those of the European

aurochs, or the American buffalo or bison, is not yet very clearly made out.

The crania, similar to those of the domestic ox, have not been found, authentically verified, except in the turbaries and other very superficial formations. It is therefore far from improbable that they are of more modern origin than the bones of the elephant and rhinoceros; nay, it is far from unlikely that they might have appertained to the original wild stock from which our native oxen are descended.

As yet no relic has been found among the fossils which resembles any variety of the Indian or Cape buffalo. Consequently, if the fossils are derived from existing species, it is from the species peculiar to cold, and not to hot, climates.

The crania resembling that of the American musk-ox, having been seen but three times, and on the coast of Siberia, there are doubts respecting not only their identity of species, but also regarding the question, whether they are truly fossil, or might have been transported from America, during the thaws, by currents, on floating ice.

Bones belonging to this genus of ruminants have, as we before hinted, been also found in certain caverns, with other osseous remains.

From all the researches which have been made respecting the ruminantia, it appears that some species existed in tolerable numbers, contemporaneously with the elephant, rhinoceros, &c., of the fossil species; but it still is extremely doubtful, that, a few excepted, they can be with confidence referred to species no longer in existence.

#### THE FOSSIL CARNIVORA.

Bones belonging to this order are not found so abundantly in the alluvial strata; but, as we have seen before, they exist in immense quantities in the caverns, and are also found in the osseous breccia. The Baron has entered very deeply into osteological details respecting both the living species and the fossil

remains, into which, as our limits must prevent our following him, we are forced to content ourselves with giving a brief view of the discoveries which have been made, and shall consider them under the head of each genus successively. We shall begin with the

#### FOSSIL BEARS.

The vast abundance of the bones of this animal in the caverns of Germany, had long ago attracted the attention of the curious, and many authors on the *materia medica* have spoken of them under the title of the *fossil unicorn*. The first truly osteological notice of them was given by J. Paterson Hayn, in the "Ephemerides of curious Matters in Nature," in 1672. He describes many of these bones, which he has figured respectably enough, under the whimsical title of the bones of *dragons*. Amongst his figures the humeri of two species are distinguishable, half a pelvis, a portion of cranium, one-half of the lower jaw, an axis, two other vertebræ, and some bones of the metacarpus. These bones were found in the first cavern of the Crapach mountains, not far from a convent of the Chartreux, near the river Dunajek. The same author mentions, in another place, some more bones found in a cavern of Liptov, near the Rag river.

In the same collection there is another notice of these bones by H. Vollgnad, who also terms them the bones of dragons, and even goes so far as to pretend that true dragons were then to be found living and flying in Transylvania. There is, however, accompanying this notice, a good figure of an entire head of our large species of bear, with the convex front. Vollgnad also gives two figures of unguical phalanges, but they belong not to *ursus*, but *felis*.

For near a century after we find nothing precise respecting these remains, in an osteological view; nothing, in fact, but an occasional notice of their existence by some mineralogist or describer of caverns. Some taken from the cave of Schartzfels are mentioned by Mylius; Leibnitz, in his *Protogæa*, gives

three fragments from the same place. Bruckmann, in his description of the caverns of Hungary, declares that their remains do not differ from those of the caverns of the Hartz; and he appears to have been the first who compared them to the bones of the bear.

As a proof the low state of comparative anatomy in those days, we find Kundmann mistaking two teeth taken from Baumann's Höhle, one for that of the horse, the other for that of a calf, whereas the first belonged to the bear, and the other to the hyæna; and we find Walch attaching to his figures, of half a lower jaw and two canines of *ursus*, the pleasant observation, that they bore a certain resemblance to those of the hippopotamus!

Esper's description of the caverns of Franconia contains a great number of exact figures of portions of the head; and though there is no complete head, yet the fragments are sufficient to distinguish the species from which they come, and which may amount to three or four. This writer, however, from his superficial knowledge of comparative anatomy, multiplied them far too considerably, making them nine in number. Some that belong to *ursus* he sometimes refers to *hyæna*, sometimes to *phoca*. There are, however, fragments belonging to other genera than the bear; some, for instance, to that of the lion or tiger, one of the wolf, and some of the *hyæna*.

M. Esper says, in a subsequent publication, that, having procured the head of a polar-bear, he recognised its decided identity with those of the caverns; and M. Fuch, governor of the pages of the king of Prussia, declares that, having had occasion to see craniums of the fossil and polar-bear together, he found the strongest resemblance between them. These assertions only prove how easily the most remarkable forms of skulls may be mistaken; for of all the bears the polar is precisely the one that has the least resemblance to the fossil.

Accordingly, we find that celebrated anatomist Cauper, in a very early stage of his researches, putting a most decided negative on this pretended identity. His principal reason is,

the want of that little tooth, which the common bears, and the polar among the rest, invariably have behind the canine. But as there were many other reasons for this negative, and many still more convincing, it became a matter of interest that some one should employ himself in collecting them. This was done by M. Rosenmüller, an anatomist of Leipsic, first in a Latin description, published in 1794, and afterwards in a little German book, called "Materials for the History and Knowledge of the Fossil Bones," in 1795. He gives a figure of a complete head of the large fossil bear, with convex forehead, the lower jaw of which appertained to an individual of larger size. This cranium came from Gaylenreuth. M. Rosenmüller enters into a careful comparison of this cranium with that of the brown bear, and with Pallas's description of that of the polar-bear. The result of this proves the three animals to have been totally different. But the author makes no mention here of the other bones of this bear, nor of the other species of ursus, with whose bones its remains are intermingled. In 1804, however, he published, in French and German, a much more detailed description, with very numerous figures, of the fossil osteology of the bear.

Peter Camper seems to have been the first who recognised any distinction between the fossil species among themselves. His researches were followed up by his son Adrien. M. Blumenbach expressly distinguishes two; that most anciently known he calls *ursus spelæus*, and a second, *ursus arctoides*, because he found in it much more resemblance than in the first to the brown, or rather black, bear of Europe. These two last, as is known, were confounded by Linnæus, under the name of *Ursus Arctos*.

Such was the state of ursine fossil osteology up to the first publication of Baron Cuvier's work. Though remote from the actual localities of these bones, he was fortunate enough, by his access to valuable collections, and the assistance of his friends, to be soon enabled to treat the subject in a manner infinitely more complete than any of his predecessors had done.

It is not only in the caverns that the bones of bears are found. Similar remains, though comparatively few in number, are found in the loose strata. Many specimens, for example, have been found in the Vale of Arno; but the Baron declares them different in species from the cavern bears.

Dr. Buckland found, in 1820, in the collection of the convent of Krems-Munster, in Upper Austria, certain crania and bones, which he judges to have belonged to the large fossil species with convex chaffron. They had been disinterred from a gravel-quarry which had been consolidated into a pudding-stone, employed in that part of the country for the purposes of building. The bones of bears have also been found in the cavern of Oreston, near Plymouth, which we mentioned in an earlier part of this essay.

As to the osteology of the fossil bears, we shall only trouble our readers with a few remarks on the teeth and crania, these constituting the most material specific characters.

The teeth of which the caverns of Germany have furnished so many myriads, have been clearly proved to have all the generic characters of the bear. The first point which indicates difference of species is their magnitude. The largest living teeth are either less than, or, at the most, but equal to, the smallest fossil; and, in general, one-fourth smaller than the largest. This constant superiority was a sufficient indication of a difference and a superior size of species, which the other parts have since confirmed. Those other parts have also proved, what the teeth alone could never do, at least not very clearly, namely, that the remains of more than one species of bear existed in these caverns.

These teeth are, in general, less worn, and have preserved their enamel and their eminences better than those of the living bears, which proves that the species from which they came were more exclusively carnivorous.

Among the fossil crania, we find the cheek-teeth worn only in the oldest and largest subjects.

But a more marked difference between the fossil and living crania, is in relation to the little molar situated immediately behind the canine, both above and below, and to the first of the molars in the series of the upper jaw. The little molar aforesaid is never wanting in the living bears at any age, and has never yet been found in the fossil of the large species, young or old, in the upper jaw. It exists, however, in the cranium of the inferior species lately described by M. Goldfuss; nor is it always wanting in the lower jaw of the other. The other difference regards the second little molar in the upper jaw, which, in the living bears, is immediately situated in front of the antepenultimate, and forms, with it, a continued series. Its alveolus has been found by the Baron but twice, in fragments of craniums from Gaylenreuth and Sundwich; but there appears no vestige of it in any other fragment, nor in any of the entire craniums seen by the Baron, or any body else. From this he concludes, that these bears had usually but three cheek-teeth above, in a continued series, and but thirty teeth in all; the living bears have generally thirty-six, and sometimes forty.

Still, however, the circumstance of these little teeth being occasionally found at all, seems to prove that the specific character of these bears was, that they lost these teeth early, not that they wanted them altogether.

The most common cranium found in the caverns having decidedly all the generic characters, and being in perfect correspondence with the structure of the teeth, all that remained was the determination of the species to which these craniums belonged. These species were at least two in number.

The first is characterized by a prominent and convex chaffron, a strong elevation of the forehead above the root of the nose, and two convex prominences on this same forehead, while no bear has so flat a forehead as the polar, to which, as we have seen, the fossil has been absurdly compared.

These crania are also remarkable for the great projection

and prompt approximation of the temporal crests, and also for the length and elevation of the sagittal, both indications of vast force in the crotaphite muscles. Now, in the polar bear, these parts are the least strongly developed. In these points the black bears, both of Europe and America, more approach the fossil; but they are as remote from it as the others, by the flatness of the front of the head.

In the peculiar serpentine line of the profile, the brown bear approaches to the fossil, and so does that other bear, which Shaw placed among the sloths; but, in other points, there is no sort of comparison.

The fossil head measures one-fourth more, from the spine of the occiput to the incisives, than the largest of the living heads; one-third more than that of the polar bear.

These peculiarities might be supposed to attach to the age of the individual, but they have been found to hold good in subjects that other characters evidently proved to have been young.

Other crania have been found equally large, but less convex, than the last; and a third one, smaller, and partaking more of the characters of our brown and black bears.

From all this the Baron concludes, that these caverns have furnished three distinct forms of the adult head. Those with convex forehead; those equally large, but flattened, and a smaller one, resembling the brown bear.

It is sufficient to observe, without entering into further details, that the entire osteology of the fossil bear justify the following conclusions:—

The most common bones in the caverns belong to this genus.

The largest of the crania, and some of the other bones, present such striking differences, that they must be regarded as belonging to species distinct from those of the present day.

Among these large crania some are less convex, and, most probably, belonged to a different species from those which are more so.

Among the other bones, there are decidedly found those of at least two species.

Some bones of one of these more resembled those of our living bears, than some of the other. A humerus, &c., in particular, were scarcely distinguishable. This was also the case with some other small bones belonging to both species.

The bones of bears are also found in the loose strata. Those observed in Tuscany differ from the cave bears, and approach more to the brown.

To the large species with convex front, the Baron gives the name of *Ursus Spelæus*. The large species with flattened front, he hypothetically terms *U. Arctoideus*. The one with small cranium he calls *U. Priscus*, and the one of Tuscany he first named *U. Etruscus*; but afterwards, on account of its compressed canines, he changed the name to *Cultridens*.

#### THE FOSSIL HYÆNA.

So much is already known and written concerning this animal that we must be brief. One hyæna has most assuredly been very abundant among those ancient animals which we have been describing. Its bones have been found not only in the caverns where we have seen the remains of the bear so abundant, but also in the alluvial strata containing the debris of elephants. There are sufficient proofs in print of the very ancient existence of some one species of this animal in three different places in Germany, in the cave of Gaylenreuth, in the sand-hills near Eichstadt, and in Baumann's Höhle. For this we have the testimony of figures given by Esper, Collini, and Kundmann, though all three mistook the animal to which the bones they figured had belonged.

Hyænas' bones have also been discovered in other parts of Germany, and in France; but by far the most abundant depôt of them was found in the cave of Kirkdale, which we have already noticed.

The Baron is satisfied, from an examination of vast numbers

of these bones, that they belonged to a species different from those which now exist.

The habits, however, of this ancient hyæna exactly resembled those of the modern hyænas. A passage of Busbequius, descriptive of their habits, has been quoted by Dr. Buckland: "*Sepulchra suffodit, extrahitque cadavera portatque ad suam speluncam, juxta quam videre est ingentem cumulum ossium humanorum, veterinariorum et reliquorum omne genus animalium.*"

If the Kirkdale hyænas did not accumulate human bones with those of the herbivora abounding there, it is very clear that the human species did not exist in the time and place in question.

The bones of hyænas have been found in other caverns of England, such as Oreston and Rugby, with the large bones already described, proving the coeval existence of this carnivorous animal with the great pachydermata in our island, as well as on the continent.

It is enough to observe, in a few words, that the fossil hyæna was nearly one-third larger than the largest of the existing species. In the structure of the teeth it more nearly resembled the Cape than the Abyssinian hyæna. The muzzle was also shorter and stronger than in either of the last, and the bite must consequently have been more powerful.

We shall conclude by extracting from Dr. Buckland the various localities on the continent in which hyænas' bones were found.

In the caves of Muggendorf, in Franconia, with bears and tigers.

In the Hartz forest, with similar bones, in Scharzfeld, and Baumann's Höhle.

At Sundwich, in Westphalia, with the bones of carnivora, and some remains of deer and rhinoceros.

In France near Fouvent, in the department of Doubes, with remains of elephant, rhinoceros, and horse.

At Kostritz, in the valley of the Elster, in Saxony, with carnivorous and herbivorous bones.

At Candstadt, in the valley of the Necker, in Wirtemberg, in the same company.

In Bavaria, on the west base of the Hartz Forest, and in the Val' d'Arno.

In the four last-mentioned places they were embedded in the ancient alluvial strata.

#### FOSSIL FELINE.

One very large animal, and another less in size, of the genus *Felis*, have left their remains in the caverns and in the loose strata. Proofs of this, as far as respects the caves of Hungary, we find as long ago as the memoir of Vollgnad, mentioned in our last article. Also from the cavern of Schartzfels we have a portion of cranium, represented by Leibnitz in his *Protogæa*. According to M. *Soemmering*, this cranium entirely resembled that of a lion of middle size, and differed in no less than thirty-six points from that of the cavern bears. But most of these have as much relation to the genus *felis* in general, as to the lion species in particular.

In *Esper's* figures from *Gaylenreuth*, there is one-half of the upper jaw and many teeth easy to be recognised as belonging to *felis*, and the resemblance of which this author himself had recognised. *M. Rosenmüller*, in his treatise of the bear, mentioned before, announced that he should soon publish a work containing a description of the bones of an unknown animal of the lion family, and adds, that those bones appeared not exactly to resemble those of the existing lion. *M. Goldfuss*, in his description of the environs of *Muggendorf*, has given a figure of a complete head, evidently of the feline genus, but of an unknown species. He says that in *Gaylenreuth* the isolated bones and teeth of *felis* are not more rare than those of *hyæna*. In *Kirkdale*, *Dr. Buckland* only found two teeth, between which and those of the existing lion the Baron can discover no difference.

The Baron, as we have said, has decided on there having

been two extinct species of felis. The first and largest he calls *Felis Spelæa*, the second and smaller *Felis Antiqua*. It is totally unnecessary, and it would be quite uninteresting, for us to enter into the osteological distinctions of those from the living felinæ, which differences, though sufficient for the naturalist, would not, perhaps, be deemed very striking by the general reader. It is sufficient to remark, that M. Cuvier has discovered in these remains a closer analogy to the jaguar than to any other living felis.

The rest of the fossil carnivora may be soon despatched. Bones of the wolf, the fox, the glutton, the weasel, the genet, and other small carnivora, have been found in the same situations as the animals we have been describing. It must be observed, however, that in no case have these bones been clearly established as belonging to species distinct from those now existing. Neither can we say that, in every instance, identity with the existing species has been proved. It is certain that these bones, be they what they may, are in the same state with those of the bears, the hyænas, and the felinæ; they have the same colour, the same consistence, and are similarly embedded. Every thing indicates that they must all be referred to the same era, and that they were all overwhelmed by the same catastrophe. The differences between them and their living congeners principally consist in relative magnitude. Two teeth were found at Avary, in France, with the bones of the mastodon, rhinoceros, and tapir, which seemed to prove the ancient existence of œanis; but one of gigantic size. The Baron calculates, that it could not be less than eight feet from the extremity of the muzzle to the root of the tail, and at least five feet in height to the shoulder. But, in general, it may be said of these animals that the resemblance to the living species is much stronger than the differences. The same observation is applicable to the same genera of carnivora whose remains were found near Paris, with few exceptions. One large animal, however, of this order was there found approximating to the racoons and coatis, but certainly not referrible even to any known genus.

But the most remarkable of this order discovered in those rich depositaries of the earlier works of animated nature, the gypsum-quarries of Paris, was a small species of *SARIGUE*, an animal the family of which is now confined to the tropical regions of the New World, and to that newer world, Australasia. The reflections of the Baron on this head are so just and striking, that we cannot deny ourselves the pleasure of a short extract.

“The rich collection of the bones and skeletons of an ancient world, which nature appears to have assembled round our city, and reserved for the instruction of the present age, is doubtless a most striking phenomenon. Some new relic is discovered every day; every successive day presents new materials for astonishment, and additional demonstration that nothing which once constituted a part of the past population of our soil constitutes a part of the present. There is little doubt, too, that proofs of this description will multiply in proportion as more interest is taken in, and more attention given to, their production. There is scarcely a single block of gypsum in certain strata that does not contain bones. How many millions of these bones have been destroyed since those quarries first began to be worked, and the gypsum to be used as materials for building! How many, even at this present moment, may not be destroyed by negligence, and how many, by their minuteness, may escape the eye of the most attentive collectors! The fragment in question is a proof of this. The lineaments imprinted in the gypsum are so slight, that it requires the very closest inspection to be enabled to trace them; and yet how valuable are such lineaments! They bear the impression of an animal, of which we find no relic elsewhere, in the same district; of an animal which, buried perhaps for myriads of ages, now re-appears for the first time to the eye of the naturalist.”

The impression of the skeleton was found nearly complete on two stones, one covering the other, and thus dividing it, as it were, between them. The animal is there, or its outlines

rather, nearly in the natural position. That it belongs to the genus of the *arigine*, now exclusively appropriated to America, the Baron has proved, by a long and scientific comparison of it with the different genera of this numerous and extraordinary family in both America and Australasia. But whether it is an extinct or a living species he has not, from our imperfect knowledge concerning this family in general, been able completely to determine. He is, however, decidedly of opinion, that it belongs to no species of that family of which we know sufficient to furnish data for a satisfactory comparison.

#### FOSSIL RODENTIA.

It does not appear that this order bore a less relative proportion to the other animals of former worlds, than it does to the population of the present. The majority, however, of the species were small, as are those of the present day, and it is only under peculiar circumstances that their remains have been remarked and collected. In fact, they have been generally found incrustated in stones, or in such concretions as have preserved them from decay. The genus of the castor alone seems to have, from its magnitude, escaped destruction under other circumstances, and some remains of it have been discovered in the loose strata.

We shall simply notice, without dwelling on them, that two species of the *RABBIT* have been found in the osseous breccia of Gibraltar, Cette, and Pisa; remains of the *LAGOMYS* in that of Corsica and Sardinia; and of the *CAMPAGNOL* in that of Sardinia, Corsica, and Cette: besides two species of the *LOIR*, or dormouse, in the plaster-quarries of Paris. Without entering into any specific account of these, we shall at once proceed to the fossil rodentia of other localities. The small bones of the caverns have been generally too much neglected. This, however, has not been the case with the cave of Kirkdale. Dr. Buckland, in his account of that, particularizes the bones of rabbits, of campagnols, and of mice found in this cavern.

Those of one species of campagnol (the *hypudæus*), about the size of a water-rat, are there in the most immense abundance. In these bones the generic characters of the campagnol, more especially of that particular subdivision to which the water-rat belongs, are easily to be recognised. Still, with the exception of the jaws and teeth, all the other bones are somewhat smaller, which causes the Baron Cuvier to consider the species as not the same. This campagnol of Kirkdale is found, on comparison, considerably smaller than those of the osseous breccia of Sardinia, Corsica, and Ceuta.

There are also in this cavern campagnols of another species, not exceeding in size the *mus arvalis*. There are also teeth found there which indubitably appertain to the genus of the rat, properly so called. There are, besides, some bones which Dr. Buckland gives as those of the rabbit, but M. Cuvier is more inclined to think (if not of an unknown species) to belong to the hare.

In the turbaries the bones of castors have been found, but in such formations scarcely any but the bones of indigenous animals are preserved. This animal formerly inhabited all the great rivers of Europe, as it does many of them still. It is not, therefore, surprising that its bones should be found in peat formations, and preserved by the same causes by which the aquatic mosses are preserved there. This proves nothing with respect to the antediluvian existence of this genus.

In the loose strata, however, near the sea of Azof, in the neighbourhood of Taganrok, was found the head of a castor, apparently of a lost species. M. Fischer, indeed, attributed it to a lost genus, which he named *Trongotherium*.

The teeth and all the forms of this head possess the characters of the castor, but the head is about a fifth larger than our European castors, which exceed the American in size. In the whole order rodentia no animal has a larger head, except the *cabia*. Another head was found near the lake Rostoff, inferior in length, incontestably belonging to a castor, and fully

agreeing in all the details with the existing castors. The stratum in which it was found is unknown.

It is singular enough that among the innumerable fish that, in various situations, fill the laminæ of the calcareous and marly schists, are found, though very rarely, some viviparous quadrupeds belonging to the order rodentia.

The most numerous and considerable have been taken from the celebrated quarries of Oeningen, where it was for a long time imagined that no animals were incrustated but those indigenous to the country.

Three species of rodentia have been drawn from thence: one is the *domestic mouse*, of which M. Karg assures us he has found several individuals. Another is the *muscardin*, of which there is one individual in the cabinet of Mersbourg: it is five inches long, but its limbs are wanting, and is so bent and compressed, that its determination is next to impossible.

There is a third preserved in the collection of M. Ziegler, at Winterthur, which is thought to be an *aperea*. In short, we may with safety say that, concerning these rodentia of the *fissile strata* of Oeningen, nothing can be learned with the least certainty. Let us pass on to the

#### FOSSIL EDENTATA.

As yet but one genus, and, at most, but two species, belonging to this order have been discovered in the fossil state. But this genus has the closest and strongest analogy with the living genera of the edentata. The animals of which we are about to treat belonged to the family of the TAEDIGRADA, constituting a distinct genus, to which M. Cuvier has given the name MEGATHEBIUM. It comprehends two species, the *megatherium*, properly so called, and the *megalonyx*.

The skeleton of the first of these animals is known almost entirely, and its examination proves that it had more analogy to the sloths than to any other living beings, especially in

regard to the system of dentition, to the form of the head, and the composition of the extremities.

As for the megalonyx, but one tooth and a few bones belonging to the limbs have as yet been collected; but those relics are sufficient to prove its approximation to the megatherium, though it must be considered specifically different.

Both were at least as large as the ox. Their limbs were robust, and terminated by five thick toes, of which only some were provided with an enormous claw, arched and crooked like the claws of some tatous, ant-eaters, and bradypi. The megatherium, of which a clearer idea may be formed than of the megalonyx, had a small head, short muzzle, terminated, perhaps, by a short proboscis, the mouth furnished only with molars, whose coronals were marked with transverse hillocks. The neck was moderately short; the body voluminous and heavy; the limbs extremely robust, and the anterior ones provided with powerful clavicles. Recent observations seem to prove, that if it had analogies with the bradypi, in the forms of the head and dentary system, and with the ant-eaters in the conformation of the extremities, it also resembles the tatous in the nature of its teguments. Its skin, thick and, as it were, ossified, was divided into a number of polygonous scales, approximating one to the other, like the pieces which enter into the composition of mosaic work.

The form of the molars, and the size of these animals, seem to indicate that they fed on vegetables and roots. The conformation of their limbs shows that their walk must have been slow and equal. Their debris have been found only in America.

The megatherium, sometimes called the *animal of Paraguay*, was discovered towards the end of the last century. The skeleton, almost entire, was found nearly at one hundred feet of depth, in excavations made in the midst of an ancient alluvial stratum, on the banks of the river of Luxan, a league south-east of the town of the same name, which is three leagues west-south-west of Buenos Ayres. It was sent to the museum

of Madrid in 1789. A second skeleton, less complete, forming part of the same collection, was sent there from Lima, in 1795. A third has been found in Paraguay. Bru put together at Madrid the skeleton of Buenos Ayres, and had some good figures of it engraved. M. Cuvier, on the examination of these figures, unfolded the affinity of this animal to the sloths and other edentata. Afterwards, Garriga, who translated Cuvier's article into Spanish, added to it the original and very extended description given by Bru. The Baron has left nothing wanting on the subject in his "Ossemens Fossiles."

Many other writers have treated concerning this animal. Abildgaard, who knew nothing of the researches of Cuvier, did yet, like him, refer the megatherium to the edentata, or the bruta of Linnæus. Shaw more tardily adopted this opinion, which Lichtenstein and Faujas combatted without success. After that, for a long space of time, nothing was added to our knowledge of this fossil animal, until Don Damasio de Laranhaia acquainted the Philomathic Society with the discovery of certain parts of the head analogous to that of the tatou, and which appeared to have belonged to the megatherium.

The general forms of the head of the megatherium resemble considerably that of the bradypi. But the most striking trait of resemblance consists in a long descending apophysis, flattened, and situated at the basis of the zygomatic arch. This arch is entire, while in the bradypi it is interrupted behind. The under part of the lower jaw has on each side a very remarkable projection, to which there is nothing analogous but in the lower jaw of the elephant, though there it is much less perceptible. The symphysis is considerably elongated, which renders the muzzle much more projecting than that of the ai or unau. The bones peculiar to the nose being very short, it is suspected that the animal might have had a trunk like those of the elephant or tapir. But, if so, this trunk must have been short, as is indicated by the length of the neck. There are neither the usual incisors, nor tusks, nor canines.

The molars, four in number on each side of the jaws, approximate to each other, are prismatic and squared, and the coronal exhibits two transverse hillocks, separated by a furrow. The bradypid have the molars separated, and preceded by a canine, in the form of a pyramid with three faces.

The cervical vertebræ appear to have been seven in number, like the unau, and not nine, as in the ai; sixteen dorsal vertebræ have been collected, and, consequently, sixteen pairs of ribs. There are three lumbar vertebræ, and the caccygian, the knowledge of which is owing to Don Damasio, seem tolerably numerous. The bones of the ilia form a semi-pelvis, rather wide, which indicates that the belly was large. The pubis and the ischion are wanting in the skeleton of Madrid.

The anterior extremities are longer, but more slender than the posterior, but have not the immeasurable length of those of the ai, nor even of the unau. The femur is thicker than that of any known animal, and its length is only double its greatest thickness; the tibia and the peroneum, also very thick and short, are cemented at their two extremities; the shoulder-blade has the same proportions as those of the bradypid; the existence of the clavicle, and the length of the phalanges of the unguiculated toes, proves that the anterior extremities might have been used for grasping, and even for climbing. The humerus is very wide in its lower part, in consequence of the great development of the crests to which the motores muscles of the toes are attached. The radius, distinct from the cubitus, had the power of rotation upon it. On the olecranon was a projection considerably marked. The hand which leant altogether on the ground, had the metacarpus very short, and composed of separate bones. The three middle toes, very thick and long, are terminated by an enormous unguical phalanx, the extremity of which is composed of an arched and conical axis, which sustains a claw, and of a deep sheath, which incloses the base of this claw, and strengthens it. The two lateral toes are shorter, appear to have had no claw, and were doubt-

less rudimentary. The hind feet are smaller than the fore, and are articulated with the tibia by a broad astragalus, in a manner much more oblique than in the bradypus. In the Madrid skeleton, but one of their toes is provided with a claw at all comparable to those of the fore-feet. Next this toe are two external rudimentary ones, and there is none visible on the interior side. M. Cuvier suspects that these feet are not completely reconstructed; for it is a rule without any exception, that all unguiculated animals have five toes, either visible or rudimentary. There is reason, then, to believe that the two internal toes are wanting, and it is possible that all were provided with claws. According to the measurements reported of the different parts of the megatherium, it must have been pretty nearly about the magnitude of the rhinoceros.

The *megalonyx* was thus named by Mr. Jefferson, the celebrated President of America, who was the first describer of some of its bones, in the thirtieth number of the "Transactions of the Philosophical Society of Philadelphia." It has also formed an object of the Baron's researches.

Its debris were found, for the first time, at a depth of two or three feet, in one of the caverns of the calcareous mountains of Green-Briar, in Western Virginia. They consist of bones of the extremities, particularly a fore-foot, the forms of which are almost absolutely identical with the analogous parts of the megatherium; but these bones are one-third smaller, though they bear evident marks of having belonged to an adult subject. A tooth, reported to be American by M. Palisot de Beauvois, has been recognised by Cuvier to be precisely and rigorously the tooth of a bradypus. It was a simple cylinder of osseous substance, enveloped in a case of enamel. Its coronal was hollow in the middle, with projecting edges; as to the form of this tooth, the megalonyx differed remarkably from the megatherium, in which the coronal of the molars is marked with transverse hillocks.

In his memoir on the megalonyx, M. Cuvier has given the

most minute details on the forms and relative localities of these different debris. He has taken particular pains to prove the resemblance which they exhibit to the analogous parts of the ant-eaters and bradypi, and has discussed and refuted the opinion of Mr. Jefferson and M. Faujas, who considered the megalonyx as a large carnivorous animal with acerated claws, and probably appertaining to the genus felis. He has particularly compared the unguical phalanges of the lion with those of the megalonyx, and shown that their difference is enormous, while between the latter and those of the edentata there is the strongest analogy.

Some time since, Mr. Clinton, of New York, attempted to prove that the debris of the megalonyx belong to the living species of the large gray bear of America. But he does not support this opinion by an exact and detailed comparison of these debris with their correspondent parts, the only process from which any just result can be expected. He confines himself to remarking that the bones of the megalonyx are not really fossil, because they have been discovered at a little depth in the loose earth, in some caverns of the United States. That the size of the megalonyx was nearly the same as that of the gray bear (the magnitude of the ox!); and that the last-mentioned animal must have the unguical phalanges extremely robust, to support the enormous claws with which it is provided.

If the gray bear differed no more from other bears in the conformation of the bones of the extremities, than they differ from each other, which is extremely probable, this opinion of Mr. Clinton's would be totally overturned by a simple comparison of these bones with the extremities of the megalonyx.

To sum up: M. Cuvier approximates the megalonyx to the megatherium, and considers that these two animals must have constituted an intermediate genus between the bradypi and ant-eaters. He considers them both as herbivorous, and the megalonyx especially as herbivorous after the manner of the

cloths, since its teeth were conformed precisely like theirs. From the resemblance of their feet he concludes that their gait was similar, their movements alike, with the differences that so considerable a volume of body in the one might have occasioned. Thus, he observes, the megalonyx could but seldom have climbed up trees, because it must rarely have found any sufficient to support its weight. This difference of habit from the bradypi, he considers no more surprising than what is found to exist in the habits of animals of the genus felis, the small species of which, such as the wild-cat and the lynx, climb trees with facility, while the larger ones, such as the lion and the tiger, rarely, if ever, do so.

Before we altogether dismiss the fossil edentata, it is necessary to notice an ungual phalanx, which appeared to have belonged to some unknown animal of this order, probably of the genus of the pangolin, but like the megatherium, of gigantic dimensions.

Those who understand the laws of comparative anatomy, and have thoroughly studied the researches of the Baron, must be satisfied that this single fragment is sufficient to prove that animals, unknown at the present day, existed in more ancient eras, and that some catastrophe has caused them to disappear from the countries which they inhabited, and, in all probability, annihilated them throughout the entire globe.

The knowledge of this fragment, the Baron says, he was but recently indebted for to M. Schleyermacher, librarian and private secretary to the Grand Duke of Hesse, who sent him a model of it in plaster. It was found, with many bones of rhinoceros, mastodon, hippopotamus, and tapir, near Eppelsheim, a canton of Alzey, in that part of the ancient palatinate which at present belongs to the Grand Duke of Hesse, in a pit of sand and gravel, supposed to have been accumulated by the alluvions of the Rhine.

On the first view, this fragment exhibits two very distinguishing characters of the order edentata. Its hinder facet for

the articulation with the last phalanx but one, is after the fashion of a double pulley, hollow on each side, with a projecting crest in the middle, which constitutes a serrated gynglymus, as in the edentata. The concave arch formed by this pulley goes more in the rear of its upper part, which prevents the phalanx from straightening again as in the felinæ, but forces it to bend underneath, as in the edentata. These characters clearly prove it to be an unguical phalanx of this order.

There are two others, which as clearly determine the genus.

1. On the unguical phalanges of the ant-eaters is a furrow, indicating a disposition to bifurcation; but the pangolins alone have this bifurcation decidedly marked, and deepening vertically through the entire elevation of the bone, as far as the middle of its length. Now, the fossil bone has this bifurcation still more strongly marked. Though one of the branches of the fork is broken towards the root, yet the entire bottom of the fissure which separates them is visible, and it must have occupied more than half the length of the bone.

2. The unguical phalanges of the pangolins want those osseous sheaths which, in the sloths, and partly in the ant-eaters and the tatous, rise on the sides of the base, and envelope the root of the claw. The largest of these unguical phalanges is marked by nothing but a slight enlargement under the base, which forms on each side a small longitudinal edge. The fossil bone is precisely similar; no osseous sheath is visible upon it.

Thus we find that this bone has nothing analogous in nature, excepting the correspondent parts of the pangolins; and from all the laws of co-existence, no other conclusion can be drawn but that the animal which possessed it belonged to the same genus with these quadrupeds. Nor was this the largest of the unguical phalanges, for it has not the slight edges of the large phalanges of the pangolins—the under part of the base is only a little rugous and inflated. The holes through which the larger vessels pass are not pierced underneath, but towards the bottom and hinder part of each lateral facet.

It is impossible to establish an exact comparison of the size of this animal with that of the pangolin, without knowing to what foot and what toe this unguical phalanx appertained. But supposing it to have belonged to the second or fourth toe of the hind foot, the fossil animal must have been more than eight times the size of the adult pangolin; and supposing the general proportions of both to have been nearly analogous, the former must have been four-and-twenty feet in length.

It is impossible to avoid remarking here, nor can it be too often impressed on the mind of the reader, how scientific a character fossil osteology has received under the hands of Cuvier. We find, from the instance just now mentioned, that a single fragment, certainly of a characteristic part, is sufficient to determine the order and genus of an animal with a precision amounting almost to mathematical certainty. We arrive, too, by the same means, at least to a strong probability regarding the dimensions of the skeleton;—a probability sufficient to warrant the inference of a specific distinction: for, in wild animals not subject in, by any means, the same proportion to those varieties which domestication induces, a considerable discrepancy of size furnishes a sufficient basis for a distinction of species.

#### FOSSIL MARINE MAMMALIA.

We now arrive at the last order of this class, in considering the fossil remains of which we will, after the example of the Baron, though contrary to the order observed in the Animal Kingdom, make some preliminary remarks on the

#### FOSSIL PHOCÆ.

It was natural enough, at a time when all the kinds of strata were confounded together, and all considered as the productions of the sea, to attribute to marine animals the osseous remains so abundantly found in certain formations. Accordingly we find the describers of fossil bones continually referring

them to the genus of the seals. But at present, when it is so amply demonstrated that the mammiferous remains inclosed in such a variety of different strata belonged to land animals, we must expect to find among them very few debris indeed of the marine genera.

In truth, nothing is more rare than the bones of seals and lamantins among the fossils. No remains of the morse, clearly established, have been found; and if there are rather more of the larger cetacea, they are always found, like those of the lamantins and phocæ, in strata evidently of marine origin, with bones and teeth of the usual fishes, and shells, or simply in alluvions very recently abandoned by the sea.

The only well-authenticated remains of phocæ have been found in the neighbourhood of Angers. They consist in the upper part of a humerus, and in the lower part of another of smaller size. They bear all the characters of the genus, and the first seems to have belonged to a phoca, about twice and a half as large as *vitulina*, and the second to a smaller one.

#### FOSSIL LAMANTINS.

Some debris of fossil bones have been found, which the Baron Cuvier has recognised to belong to this genus. The principal portions have been discovered by M. Renou, in a very coarse shelly limestone, of which a part of the hillocks bordering the river of Layon, in the department of the Maine and Loire, is composed. These debris consist of fragments of the head, anterior extremities, and ribs, and they were accompanied with other fragments which appeared to have belonged to the bones of phocæ and cetacea. All these bones were changed into a ferruginous reddish limestone, which was found to contain some fluat of lime.

These debris of lamantins differ sufficiently from the analogous parts of the known species, to justify the inference of specific distinction. It would also appear that they belonged to a lost species, like all the mammalia found in similar marine

depositions. This species seems to have been remarkable for its size, and the peculiar forms of the head.

Other debris of lamantins, not so well characterised, consisting of remains of ribs, have been found by M. Dargelas, at Capian, about fifteen leagues from Bourdeaux. They were also in a marine coarse limestone, and had suffered the same change as the former.

Some more fragments of ribs of lamantins were found at Marly, enclosed in the plastic argilla which is generally found above the chalk formation, wherever it exists in the environs of Paris.

They have also been found in a few other localities, which it would be superfluous to enumerate.

It is quite certain, however, that an animal of this genus, now proper to the torrid zone, inhabited the ancient sea which covered Europe with its shells, at a period subsequent to the chalk formation, but anterior to that of the gypsum in which the ancient pachydermata were found.

#### FOSSIL DOLPHINS.

A dolphin, approximating to the grampus and globiceps, was discovered by Cortesi, on the acclivities of the Apeninnes, to the south of Fiorenzuola, in 1793. The skeleton was found almost entire, in a bluish argilla, filled with marine shells. The head was nearly complete, and also one of the branches of the lower jaw. Even the bones of the ear were in their proper places. There remained thirty-three vertebræ; twenty ribs, thirteen of one side and seven of the other; three quadrangular bones, supposed to belong to the sternum; and some small bones, more or less mutilated, which M. Cortesi supposed to appertain to an anterior extremity.

There were twenty-eight teeth in each jaw, fourteen of a side, in all fifty-six. It does not appear that any grampus or globiceps possesses an equal number. The largest of these teeth were two inches long.

In other points this fossil dolphin differed essentially from the congeners we have named. The head was much more narrow in proportion to the length, the muzzle much longer in proportion to the cranium, the orbit smaller, and the indentation before the nostrils more narrow and more hollowed.

In the dimensions of the other parts similar differences existed, and M. Cortesi calculates, with great probability, that the animal was nearly thirty feet long.

On the whole, the Baron concludes that it belonged to a species different from those of any of the genus now existing.

Another dolphin, with a peculiarly long symphysis of the lower jaw, was discovered in the falun of the department of Landes, at Sort, a village two leagues from Dax. This falun is very abundant in shells and other marine productions.

A tolerably complete jaw of this dolphin is in a collection made by M. de Borda d'Ovo, and attached to the town of Dax, along with another fragment containing some teeth.

The peculiar character is the length of the symphysis, to which no living dolphin approaches, except the *frontatus*, and the species of the Ganges. Both these, however, are much smaller, and differ somewhat in the form of this part and of the teeth, and in the number of the latter. The conclusion from these and other considerations is, that the species to which this dolphin belonged is unknown, at least as far as our very imperfect knowledge of the cetacea will bear us out in such a conclusion.

In the formation above mentioned was also found a portion of lower jaw, indicating a species very near the common dolphin, but with some slight differences.

A portion of upper jaw, found in the *calcaire grossier* of the Orne, seemed also to belong to a dolphin different from any known species. The characteristic distinction is, that the pyramidal and descending projection of the back nostrils begins to be visible opposite to the last molars. This is not the case with any living dolphin with which we are acquainted.

## FOSSIL NARWHALS AND CETACEA,

*Approaching the Hyperoodontes and Cachalots.*

The osteology of the cetacea was too little known, even a comparatively short time back, to distinguish the *Narwhal* by any character but the long tusk. This, however, is one not easily mistaken, if met with. Still the examples of it are very rare, and, what is more, by no means well authenticated.

Mr. Parkinson speaks of two fragments of it in the Leverian museum, and suspects that they were found on the coast of Essex.

Georgi, in his description of the Russian empire, speaks of a fossil tooth from Siberia, in the museum of St. Petersburg; of another from the banks of the Indigirska; and a third found in a marsh near the Anadir.

The geological position of these, and one or more other fragments, is totally unascertained: it is, therefore, superfluous to speak of them further than as affording a motive to ulterior researches.

The petrified head of some unknown genus of cetacea, approximating to the hyperoodontes and cachalots, was discovered in 1804 on the coast of Provence. To this genus the Baron gives the name of *Ziphius*. The head differs from that of the hyperoodon, in the maxillary bones not forming vertical partitions on the sides of the muzzle, and in the partition behind the nostrils not only rising vertically, but also curving, so as to form a kind of half cupola over these cavities. The species to which this head belonged, M. Cuvier calls *Ziphius cavirostris*.

These portions of petrified heads, found in excavating the basins of Anvers, presented generic characters, like those of the last, with sufficient indications of a distinct species, to which our author gives the name of *Ziphius planirostris*.

A petrified fragment, preserved a long time in the Paris

museum, indicates a species approaching to the preceding, but with much more elongated muzzle. This is Cuvier's *Ziphius longirostris*.

#### FOSSIL BALÆNÆ.

It is evident, from divers accounts, that more or less considerable portions of the skeletons of the larger cetacea have been found embedded in various places, and among them there are many attributed to the balænæ. But the authors of these accounts have rarely given drawings or descriptions sufficiently precise to enable us to determine the species. Such is the case with some bones found in Clackmannan, in Scotland, in a mutilated state, but which indicated an individual of considerable size. As they were found, however, only at eighteen inches depth in a recent alluvion, it is more than probable that they belong to a living species.

But two skeletons of a whale, of the sub-genus of the *rorquals*, were discovered by M. Cortesi, in Lombardy. The first in 1806, on the eastern side of Monte Pulgnasco, six hundred feet below the summit, which is itself elevated twelve hundred feet above the plain. In this part the hill is formed of regular strata of bluish argilla, inclined towards the north, and filled with marine shells, exactly like those on the opposite hill, where the same naturalist discovered the skeleton of the dolphin which we have already mentioned.

Excepting some ribs a little scattered, the bones of this skeleton were found in their natural connexion. It was surrounded by innumerable shells, and especially by a small species of the oyster. There were also many teeth of the *squalus* there. The head, &c., presents all the sub-generic characters of the rorqual, with specific ones that are incontestable. These consist principally in the dimensions and conformation of the lateral parts of the frontal bone, and in the more speedy union of the transverse crests at the anterior part of the same bone into a middle and longitudinal crest.

The entire length of this skeleton might be about one-and-twenty feet; but a small porqual, if adult.

The other skeleton of the same species was discovered in 1810, in a neighbouring valley. It was much less preserved, and in its actual state was only twelve feet five inches long. Its characters were precisely similar to those of the other.

A considerable fragment of the head of a balæna was found in the centre of Paris, in 1799, by a wine-merchant of the Rue Dauphine, making excavations in his cellar. The proportions were different from those of the living balænae, and there is great probability that it belonged to a species hitherto unknown even among the fossils.

Having finished this last order of the mammalia, we shall say a few words on it, by way of recapitulation.

The fossil bones of cetacea which have been collected or described, are far more numerous than those to the notice of which our limits have of necessity confined us. But, in fact, it must be observed that, even were those limits much more extended, we should only be spinning out our observations, and fatiguing our readers to little purpose, by entering more largely into the detail of accounts which have neither sufficient authority nor sufficient precision to confer upon them interest or importance. In most cases the remains themselves are not in the state of preservation which can enable a naturalist to appreciate their forms, and, consequently, to determine the species to which they belonged. But even were it otherwise, the determination of the fossil cetacea must be still attended with difficulties of no common kind. Fossil remains can never be properly determined but by a minute and critical acquaintance with the osteology of living species, an acquaintance which we are yet far from possessing with the animals of the order in question. We find, in general, that the departments of natural history which relate to the large animals of all species, are precisely those in which error and confusion more especially predominate. The reason is, that over such animals

man can seldom exercise a sufficient control. It is not possible to know and distinguish any species but those which we are able to examine nearly, and compare carefully one with another. Many of the larger quadrupeds of the earth disdain our sway, and will not submit themselves to our inspection. The wild and fearless tenants of the desert, the mountain, and the forest, are often alike intractable by force or kindness. The puny power of man cannot always cope with their giant strength, or soften their indomitable ferocity; nor can his flimsy stratagems escape their penetration, or deceive their vigilance. We find, therefore, in many instances the accidental possession of a single individual sufficient to overturn many of our received notions respecting the habits, and even the conformation, of a species. A nearer view serves to falsify the accounts of careless, ignorant, or inventive travellers, which may have been long entertained by philosophers as well as fools with easy credulity. A case in point has occurred almost at the very moment I am writing. The presence of a camelsopard in the capital of France has at once dispelled a variety of illusions connected with the structure and habits of this singular quadruped. Animals must be under immediate and constant inspection, and under the inspection of the skilful naturalist, before almost any thing can be predicated with certainty of their peculiarities. Before such inspection the fine-spun cobwebs of theory, and the fairy fictions of imagination, vanish "like the baseless fabric of a vision." The progress of science, while it unfolds to us the real wonders of nature, destroys the marvels and monstrosities of man's creation.

If such observations are applicable to the larger animals of the earth, with how much more force will they not apply to the gigantic inhabitants of the deep? They more particularly hold good respecting the larger cetacea. These have excited universal astonishment by the enormity of their dimensions, and have given rise for ages to the most unparalleled exertions of activity and courage. Yet, except when, by a felicitous

chance, their bodies have been cast ashore, in the neighbourhood of some enlightened man, they have been scarcely ever described with exactitude, or compared with accuracy.

Myriads of sailors have caught and divided whales, who perhaps have never had the opportunity of properly contemplating one in its entire state. Yet naturalists have deemed themselves able to compose the history of these animals, from the vague descriptions and the ruder figures given by such uninstructed observers. No critical accuracy, no correct deduction, could exist in such compilations for want of the proper basis of well-authenticated facts. Consequently we find the history of the cetacea, on the one hand, meagre in the extreme, and, on the other, swarming with contradictions, and confusions of nomenclature.

Furnished with such imperfect materials of truth, and perplexed and encumbered by such abundance of falsehoods, the most expert naturalist must encounter incalculable difficulty in separating the one from the other, and reducing the chaotic mass to any thing like harmony and order. He must beware of attaching too much importance to these vague and contradictory accounts, as to establish on them alone the distinction of species, and still less those of genera and sub-genera. It is no doubt easy, from rude figures drawn from imagination or memory—from confused and mutilated descriptions—from the accumulation of synonymes, which are but copies of each other, to produce a long catalogue of species which have no reality, and which the slightest breath of criticism is sufficient to destroy; but a line of conduct precisely the reverse of this is necessary to be pursued, if natural history is ever to be freed from absurdity and disorder, and established on the basis of truth.

One of those causes which have most contributed to embarrass the history of the cetacea is, that the people of the North, from whom our knowledge of them is chiefly gleaned, as it is in their latitudes that they most abound, designate them all by one common generic name. Thus, *wall* in German, *whale* in

English, *huval* in Swedish and Danish, *qual* in Norwegian, and *hvalne* in Islandic, is applied to all cetacea without discrimination. In French, too, this word, which probably has some relation with *φαλαίνα* and *balæna*, has constantly been translated *baleine*, even when it simply signified the dolphin, and has led naturalists, who did not understand the full extent of its acceptation, into the most serious errors\*.

We may, however, in summing up this account of the fossil cetacea, speak with tolerable certainty of the following remains.

There is, as we have seen, a collection of vertebræ in the Paris Museum, from the basin of Anvers, which approach the form of the corresponding vertebræ in the dolphins, but the body of which is more elongated in proportion to their diameter, and which appear to have belonged to two or three species of different sizes, the largest of which may have been double the size of the grampus. There are also among them some flattened ones, almost similar to those of the dugongs and lamantins.

From the environs of Havre, and some other places, there are more of these bones in the same collection, the locale of which has not been well described, and which do not appear, in what remains of them, to differ from the existing balæne and cachalots: but the apophyses are too much fractured to furnish characters that can be distinctly appreciated.

The same may be said of a certain number of entire or mutilated ribs, which were found in various situations. One, for example, from the valley of l'Authie, near Montreuil-sur-

\* The word *wal*, imported by the Normans, was used on the French coasts in the middle ages. In several charters of the eleventh century, when mention is made of an association of whalers, they are designated *societas*, or *communio walmannorum*. The cetacea are also called in these charters, *crassus piscis*, *grassus pesius*, and generally *piscis ad lardum*. It would appear that those animals were estimated more highly in those days than at present. The flesh was a common article of food, and sent in great quantities to Paris. From *crassus piscis* comes the French *graspois*, and the English *grampus*. *Graspois*, for a long time, signified the fat of the cetacea generally.

mer. This rib entirely resembles that of a small whale; it was found two leagues from the sea, in a sandy stratum, at a depth of twelve feet.

An enormous shoulder-blade was taken from the lake of Geneva, which, to all appearance, had belonged to a rorqual.

A radius, disinterred in the neighbourhood of Caen, though destitute of its epiphyses, exhibits the proportions and forms of the radius of a whale.

But all these last-mentioned fragments, though giving additional demonstration to the existence of the cetacea among the fossils, afford no positive indication of the species to which they belonged, whether living or extinct.

It is sufficient to draw the reader's attention to the better-determined specimens we have already noticed, and the incontestable result which flows from them. This result is, that all the marine mammifera collected in the strata, and whose species it has been possible to characterise, do not differ less from their existing congeners in our seas, than the fossil land animals, of which we have previously treated, do from theirs. Nay, we may go farther and say, that they differ very sensibly from all the cetacea that have been observed up to the present time in every sea.

Thus, the lamantin of the neighbourhood of Angers is not only of a genus foreign to our climates, but of a different species, both from the lamantins of Africa and America, and still more so from those animals of the Indian and Pacific oceans, which had hitherto been deemed as approximating to this genus.

The dolphin again, with long symphyses, disinterred by M. de Borda, is entirely unknown among the numerous species of this genus described by naturalists. The dolphin with narrow muzzle, of the environs of Angers, and the dolphin with broad muzzle, discovered by M. Cortesi in Lombardy, though much less remote from the living congeners, are yet distinguished from them by characters of a nature perfectly specific.

The same may be said of the rorqual of Lombardy, for the

discovery of which we are also indebted to the researches of M. Cortesi.

But what is far more singular than all this is, that there are among the fossils three or four species so utterly dissimilar to all the other cetacea, that it has been found necessary to form them into a separate genus.

The ZIPHIUS, as we have seen, comprehended animals neither altogether balænae, nor cachalots, nor hyperoodontes. They hold in the order cetacea a place analogous to that which the mastodons, the palæotheria, the anoplotheria, and the lophiodons hold among the pachydermata, and the megatherium and the megalonyx among the edentata. Like these, they are, in all probability, the relics of a destroyed creation, whose living types it would be vain to seek for in our present world.

These researches on the lost cetacea tend more and more to confirm the opinion to which the examination of the fossil shells had already conducted naturalists. From them it is still more evident, that not only have the productions of the earth changed with the revolutions of the globe, but also that the sea itself, the principal agent of these revolutions, has not preserved the same inhabitants: that when it formed those immense calcareous beds, replete with shells, almost all unknown in the present day, the large mammifera which it supported were different from its modern tenants of the same class. It appears that their gigantic size and tremendous force did not avail them better in resisting the catastrophes of their native element, than did the robust proportions of the mastodon, the elephant, the rhinoceros, or any other of those monstrous quadrupeds avail their possessors in resisting the revolutions of the land. Whether it is in the power of man, or not, completely to extirpate any race of animals, is doubtful; but it is evident that where man was not, nothing could have destroyed these numerous and powerful tribes, but a grand and general convulsion of nature.

## FOSSIL BIRDS.

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NATURALISTS are agreed that, of all animals, the birds are those whose bones or other debris are most rarely to be met with in the fossil state. Some have even gone so far as absolutely to deny their existence. It is, indeed, a remarkable fact, and one of the many singularities attached to the gypsum strata of Paris, that there are scarcely any other fossil bones of birds, well authenticated, except those which they contain; and it is even but a short period since the true nature of these fossils has been clearly ascertained.

We shall give a rapid sketch of the various testimonies which have been given by writers, from time to time, concerning true or pretended ornitholites.

Walch had pretty early made a considerable collection of these, to which Hermann added many others. But the first of these writers was frequently deceived from the want of due precaution. Even Gesner has declared that stones named after certain birds, supposed to be petrified therein, such as *hieracites*, and *perdicites*, have no other relation with them, than some resemblance of colour.

Neither do the rude figures of birds, traced accidentally on some coloured stones, appertain to the ornitholites, nor yet the stones or flints figured by chance into a likeness to certain parts of birds. The cock of Agricola, and the hen of Mylius, imprinted on a slate from Ilmenan, are of this description.

Many authors have very gratuitously considered certain fossil bones as belonging to birds, merely because they were light and slender; but a little attentive examination soon proved them to be parts of fishes, of small quadrupeds, and sometimes even nothing but shells or crustacea. Thus, the *sulculata littoralis rostrata* of Luid seems to be nothing but

the extremity of the dentelated spine of the fin of some fish., Romé Delille, in his catalogue of the collection of Davila mentions a beak found in the neighbourhood of Reutlingen, and a bone from Cronstadt, which he thought belonged to a chicken ; but this pretended beak turns out to be nothing but a bivalve shell, which shows itself obliquely on the surface of the stone. If it were a genuine beak, it would differ most prodigiously from any thing with which we are acquainted in existing birds ; as for the bone, there is neither figure nor description of it in the work.

Scheuchzer speaks of the head of a bird, in a black schistus from Eisleben ; but he subsequently adds, that it might be taken for a pink-flower—this is quite sufficient.

Many writers quote the description of the environs of Massel by Hermann, as if he had spoken there of the bones of birds ; but the fact is, he only mentions small bones, without specifying to what they belong.

The error of compilers respecting the petrified *cuckoo* mentioned by Zannichelli, is still more glaring, and positively ludicrous. That author, in fact, speaks of a fish so called, and which belongs to the genus *Trigla* (*Trigla culus* of Linnaeus, in Italian *pesce capone*) and not of a bird.

There are other testimonies on this subject, wholly unsupported by details, figures, or descriptions. Such are those in the *subterranea Silesia* of Wolkmann, and those of many other systematic mineralogists. It is utterly impossible to establish any thing on such vague indications.

It is quite evident that what are termed incrustations, have nothing to say to the subject in question. We are not inquiring whether birds, exposed in particular situations to waters charged with mineral substances, may be enveloped in those substances, but whether there have been any remains of birds arrested and inclosed in the grand strata which occupy the external surface of the globe.

Thus, the examples of birds, of eggs, and of nests, incrustated

in gypsum, tufa, salt, or other minerals, related by Volkman, Lesser, Bruckmann, Baccius, Bucner, Dargenville, and Bock, even if true, would prove nothing for the existence of ornitholites.

After all these exclusions, nothing remains but some debris contained in certain schists, as those of Oeningen, of Pappenheim, and of Mount Bolca, which have any pretensions to a serious examination, or, in fact, which have even been considered as ornitholites by any real naturalists.

Now, all that is cited on this head is either more or less equivocal, or, at all events, unsupported by sufficient figures or descriptions. These schists swarm with the bones of fishes and other marine productions. How can it be supposed that, in such situations, it is always possible to distinguish the bones of fishes from those of birds? What mode is there of judging when no entire limb, when no part of sufficient importance, remains?

The authority of M. Blumenbach must be considered as having the greatest weight on a point of this kind. But all he says is, that at Oeningen were found the bones of water-fowl. He refers us to the Memoirs of the Academy of Mannheim for an account of the bones of Pappenheim; but all we find there is a notice of a singular reptile (the *pterodactylus*) and not of a bird, as M. Blumenbach says, of the order palmipedes.

It seems, in short, from a careful examination of the testimonies given by various writers on this subject, that no well-authenticated bones of birds have been found any where, except in the gypsum of Paris.

It is not very long since these remains have been properly authenticated. Lamanon, indeed, as long ago as 1782, described the impression of an entire bird found at Montmartre by M. Darcet. Were we to trust to the figure which he has given, no doubt could remain on the subject, for it represents a bird completely. He has even put feathers on the wings and tail.

Unluckily, however, the aid of imagination was summoned, in the drawing of which we speak, and the picture is exceedingly unlike the original.

Fortis, who had conceived strong prejudices against the existence of ornitholites, examined afresh the specimen which Lamanon had described. He also gave a figure of it according to his own notions. This is a striking example of how differently the same object may appear, according to the notions of the observers. In Fortis's figure the head is placed below, all the inequalities of the stone are exaggerated, and the osseous impressions weakened, and the author declares that he can see nothing but a frog or a toad in the fragment in question.

The stone, however, turns out to be a genuine ornitholite. Yet this point might still have remained doubtful, but for subsequent discoveries of similar specimens better characterised.

Peter Camper takes notice of one, but without describing it, in an article on the fossil bones of Maastricht, inserted in the "Philosophical Transactions for 1786." This was a foot found at Montmartre; a second specimen, also a foot, from the same place, was described by the Baron as early as the year 1797. At the same time he learned that two other specimens were in the hands of a person in Abbeville, who had received them from Montmartre: these were the body of one bird, and the leg of another. It was easy to observe that the leg did not belong to the same individual as the body, for even the stone which incrustated it was derived from a different stratum.

Here, then, were four specimens of ornitholites, perfectly well authenticated, as long back as the year 1800. Since that period the Baron has continued his researches, and collected so great a number, that no manner of doubt could remain that the gypsum quarries contained the debris of birds in great abundance.

The feet are by far the most remarkable part in all the ornitholites, even to the most inexperienced eye. The foot, in

fact, of every bird is composed in a very peculiar manner, and resembles that of no other animal whatever. The birds are the only class in which there is but a single bone to answer the purposes of the tarsus and metatarsus. In the horses, the metatarsus consists but of a single piece, whereas the tarsus contains many. In the jerboa and alactaga there is also but a single bone of the metatarsus, which supports the three principal toes. But the bones of the tarsus are distinct. In the tarsiers and galagos, the scaphoid and calcaneum are elongated, so as to give as much length to the tarsus as in certain birds. But the other bones of the tarsus and metatarsus do, nevertheless, equally exist. Frogs, toads, &c., also have the tarsus considerably elongated. But it is always composed of two long bones and several small ones.

In the number of toes and of articulations on each toe in the birds, characters are found no less striking than those furnished by the tarsus.

The birds are the only class in which the toes are all different in the number of their articulations, under which nevertheless this number and the order of the toes are fixed. The thumb, for instance, has two articulations, the first toe of the internal side three, the middle toe four, and the external five.

To this rule there is but one exception, and that is in the case of birds which have no thumb; but the other toes preserve the usual number of articulations.

This rule is never completely observed, excepting in this class.

The quadrupeds have two articulations on the thumb and three on the other toes, be the number of the toes what it may. The tridactyled sloths alone have but two, because the first phalanges are cemented with the bones of the metatarsus. Some few toes, indeed, that are concealed under the skin, want the usual number.

In the reptiles the number of articulations is less equal, but scarcely ever do we find them exactly the same as in the birds.

The following table shows the number and order of articulations in the various reptiles :—

Land tortoise . . . . .	2.	2.	2.	2.
Marine tortoise . . . . .	2.	3.	3.	3.
Crocodile . . . . .	2.	3.	4.	5.
Lizards of all species . . . . .	2.	3.	4.	5.
Cameleons . . . . .	1.	2.	3.	3.
Seps tetradactylus . . . . .	2.	4.	5.	2.
Seps tridactylus . . . . .	2.	3.	4.	
Frogs, toads, &c. . . . .	2.	2.	3.	4.
Salamanders . . . . .	2.	3.	3.	2.

Thus we see that in the crocodile alone the number of articulations are the same as in the birds; but as each of their toes is supported besides on a particular bone of the metatarsus, there can be no mistaking the foot of one for that of the others.

Now, all the different feet in the ornitholites examined by the Baron had precisely the characters we have just instanced as belonging to the birds. In one of the feet we mentioned above, the thumb was wanting, but the little supernumerary bone which supports it in many birds was observable. In another specimen these characters were still more complete; the femur was wanting, but the tibia was more entire, and the thumb and three other toes are very complete, and provided with their entire number of articulations.

In another specimen belonging to the Baron, the tibia and tarsus were rather longer than in the last. Feet of a similar description are very common in the gypsum, and seem to belong to a different species.

A third species is indicated by a foot about the same size as the last, but in which the bone seems thicker, and the tarsus more arched in its length. In other respects it has all the characters of the genuine foot of a bird, except that the external toe having left but a single print of its upper part, the three articulations of which it should be composed are not well distinguished.

To a fourth species belonged the foot, which we mentioned

before as accompanying an impression of the body of a bird. That it could not have belonged to that body, is proved by the latter having its femora, while there is another femur with the foot, which is moreover much too large in proportion. The foot itself is also too large, and the bones too thick, to suffer it to be confounded with any of the preceding. The characteristics of the bird are all perfect in it.

From the discovery of some other feet, into a detailed description of which it is quite unnecessary to enter, the Baron concludes from these alone, that there were at least nine species incrustated in the gypsum. From such a number of fragments attesting, by their assemblage, the existence of ornitholites in the regular rocky strata, it was impossible that any doubt could remain on this subject; and, consequently, the negative arguments of Fortis, and other naturalists, against their existence, must fall to the ground before the evidence of facts.

Several other little isolated bones proved, on examination, to be referrible to the class of birds. A portion of tarsus, divided below into three apophyses, each terminated by a demipulley, for the articulation of the first phalanges of the three front toes, proved to be of this description.

Among the quadrupeds, none but the jerboa and alactaga exhibit any thing similar. But as there is no other indication in all the plaster-quarries of such animals, the remains in question must not be referred to them.

The femora of birds have also a distinctive character, which belongs to the peculiar nature of the knee. This articulation in birds is provided with a sort of spring, analogous to the hinges of a clasp-knife. The blade, we know, has but two points on which it can rest steadily; namely, when it is completely open or completely shut, because there are only those two points on which the spring is not removed from its natural position.

Now, the birds having but two feet on which to find a solid seat, have received an articulation of this kind with two fixed

points; namely, that of the greatest flexion, and that of the most perfect extension. Those are the only points in which the ligaments are not stretched, and in which the bones are preserved in their proper places by the simple action of these ligaments, unless the bird makes an effort to displace them. The head of the peroneum produces this effect, by its mode of catching in a particular fossa of the femur.

This head enlarges very much from front to rear, and its upper edge is nearly a straight line, which mounts obliquely behind, thus rendering its posterior extremity more elevated than the other. The femur rests upon this right line by a projecting line drawn over its external condyle, the middle of which forms an almost semicircular convexity, while the two ends, on the contrary, are a little concave, and the two bones are attached in this place by an elastic ligament which goes from one to the other, crossing almost perpendicularly the line by which they touch.

It is clear, then, that this ligament will be more stretched, according to the degree in which the femur shall touch the peroneum by the convexity of the projecting line which we have described: that is, so long as the leg is neither completely extended, nor completely bent. But in these two extreme positions the peroneum will re-enter into one of the concavities placed at the two ends, and will be retained there by the elastic contraction of the ligament.

The femur, then, of birds is distinguished from that of quadrupeds in this,—that its external condyle, instead of presenting a simple convexity behind, for the external fossa of the head of the tibia, presents two projecting lines: one stronger, which is the true condyle, and which corresponds to the upper external facet of the tibia, and the internal facet of the peroneum; and another more exterior, descending less, and resting on the upper edge of the peroneum. The external condyle, therefore, of birds is forked, or hollowed into a canal more or less deep behind.

The only quadrupeds in which any thing analogous may be suspected, are those which, like the birds, rest and leap on their hinder feet, with the body in an oblique position; such are the kangaroos and jerboas.

We do find, in fact, in the various kangaroos a slight indentation in the rear of the condyle to which the peroneum corresponds, but only by a tubercle. The jerboas have not this conformation. In the helamys of the Cape, indeed, there is a particular osselet, which establishes a connexion between the peroneum and the femur, but not in the same manner.

There are moreover many traits which must prevent us from ever confounding the femur of a bird with that of a kangaroo, as well as with that of any other quadruped. Such, for example, is the breadth of the great trochanter from front to rear, &c.

By the observation of these characters, two femora found in the gypsum were clearly recognised to belong to birds. Their cavity was filled with gypsous matter; they had not been crushed by the weight of the strata deposited upon them, and their forms were preserved perfectly entire.

The tibia of birds is doubly characterised, by an upper head corresponding to the form of the femur just described, and by a lower one in the shape of a convex pulley, with a concave neck, on which is articulated the bone of the tarsus. Many such bones are found in the gypsum. The humerus of birds is not less distinguished than the femur and tibia.

The characters consist in the two extremities. In the upper one the head is always oblong from right to left, to play like a hinge in the articulation to which the shoulder-blade and clavicle contribute.

This part of the bone is singularly enlarged by two lateral crests. The upper, or rather the external one, which is angular, and the edge of which is trenchant, and a little re-curved in front, serves to give sufficient attachments to the great pectoral muscle, the powerful action of which constitutes the

*primum mobile* of flight. The opposite crest is not so long, its edge is rounded, and a little curved behind, where it forms towards the head of the bone a small crook. Under this crook is the hole by which the air penetrated into the cavity of the bone. In quadrupeds this head is always round, the crests small, and that part of them near the head forms tuberosities.

Even the bats do not resemble birds in the humerus. The mole alone exhibits any analogy with them in this respect, because the manner in which that animal throws the earth backward in burrowing, equally demands a great force in the pectoral muscles. But it is useless to dwell on this exception, as the rest of the humerus of the mole is distinguished by such extraordinary forms, that it is impossible to confound it, not only with the humerus of birds, but with that of any other known animal.

The character of the lower head of the humerus of birds is not less striking than that of the upper. The articulating pulley is divided into two parts, one internal, or inferior, almost round, for the cubitus; another external, or superior, for the radius. This last is oblong, in the direction of the length of the bone, and thus re-ascends a little obliquely over its anterior face. In this manner the radius has a greater arch to describe than the cubitus, and the motion of the fore-arm is not made on a plane, perpendicular to the anterior face of the humerus.

The lower part of this radial face enlarges behind, and rests on an external articular facet of the cubitus.

There is nothing similar in the quadrupeds. The cubital pulley is always concave, and the radial is also hollowed in a furrow, in such animals as have not the power of supination in the fore-arm.

All these distinctive characters of the humerus of birds are found in certain specimens from Montmartre. The characters of the radius are also found in certain specimens from the same place; all have the upper head round, and a little concave—the smallest has the inferior extremity more enlarged, precisely as in the birds.

# T A B L E

OF THE

## GEOLOGICAL FORMATIONS, IN THE ORDER OF THEIR SUPERPOSITION;

AS ARRANGED BY M. AL. DE HUMBOLDT.

<i>Tertiary strata.</i>	
Alluvial depositions.	
Lacustral formation with millstones.	
Sandstone and sands of Fontainbleau.	
Gypsum with fossil bones. Siliceous limestone.	
Coarse limestone. (London clay.)	
Tertiary sandstone with woodstone. (Plastic Clay—Molasses—Nagelfluhe.)	
Chalk.	white.

Secondary

strata.

chlorited.

Green sand.

Weald clay.

Ferruginous sand.

(Secondary sandstone with lignites.)

*Ammonites.*

Jura limestone.

*Planolites.*

Schistous layers with fish and crustacea.

Quadersandstein, or white sandstone, sometimes above the lias.

Coral rag.  
Div. clay.  
Oolites and Caen limestone.

Muschelkalk.

*Ammonites nodosus.*

Marle or calcareous lias with *Gryphaea arcuata.*

Marle with fibrous gypsum.

Saliferous variegated sandstone.

Arenaceous layers.

*Product. aculeat.*

Magnesian limestone.

(Alpine limestone.)

Zechstein.

Coppery schist.

Quartziferous

Co-ordinate formations of porphyry, red sandstone, and pit-coal.



























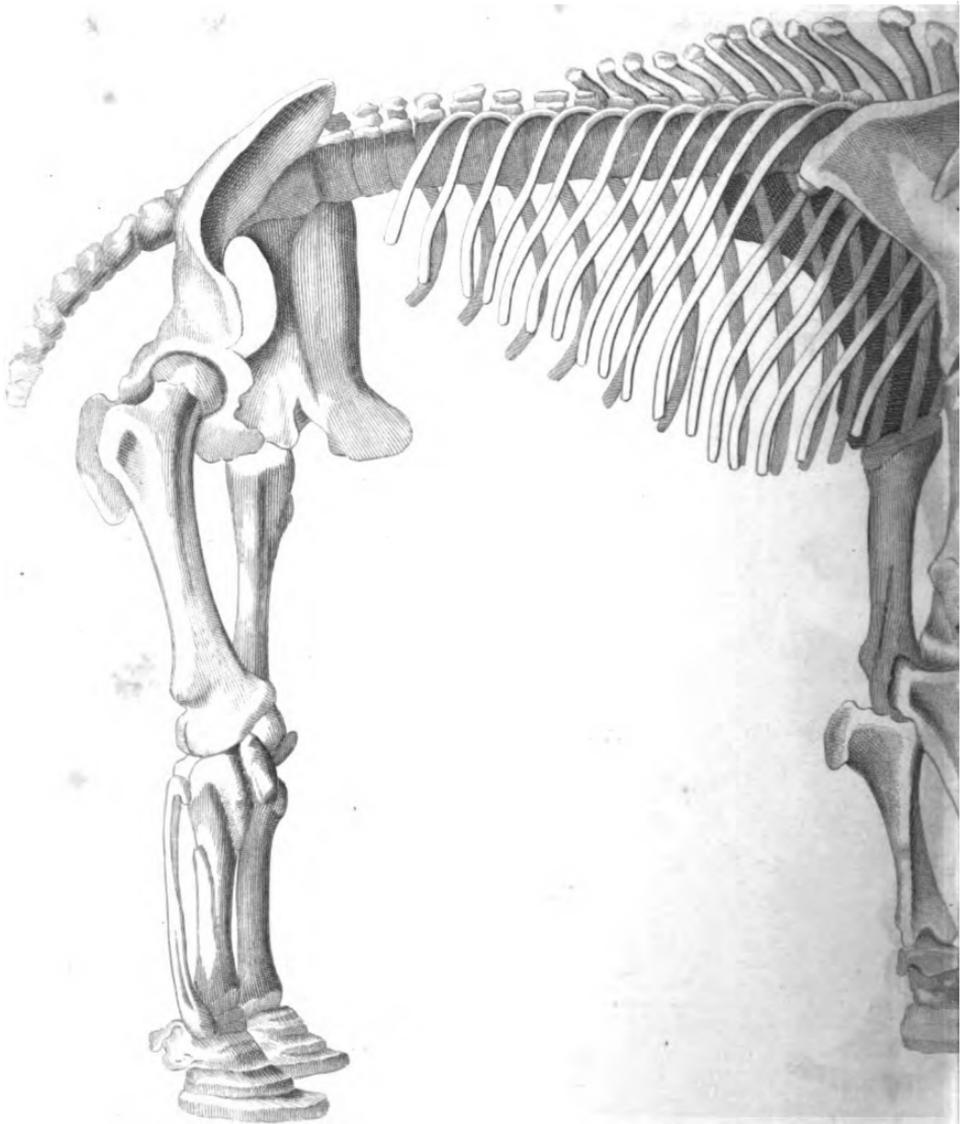




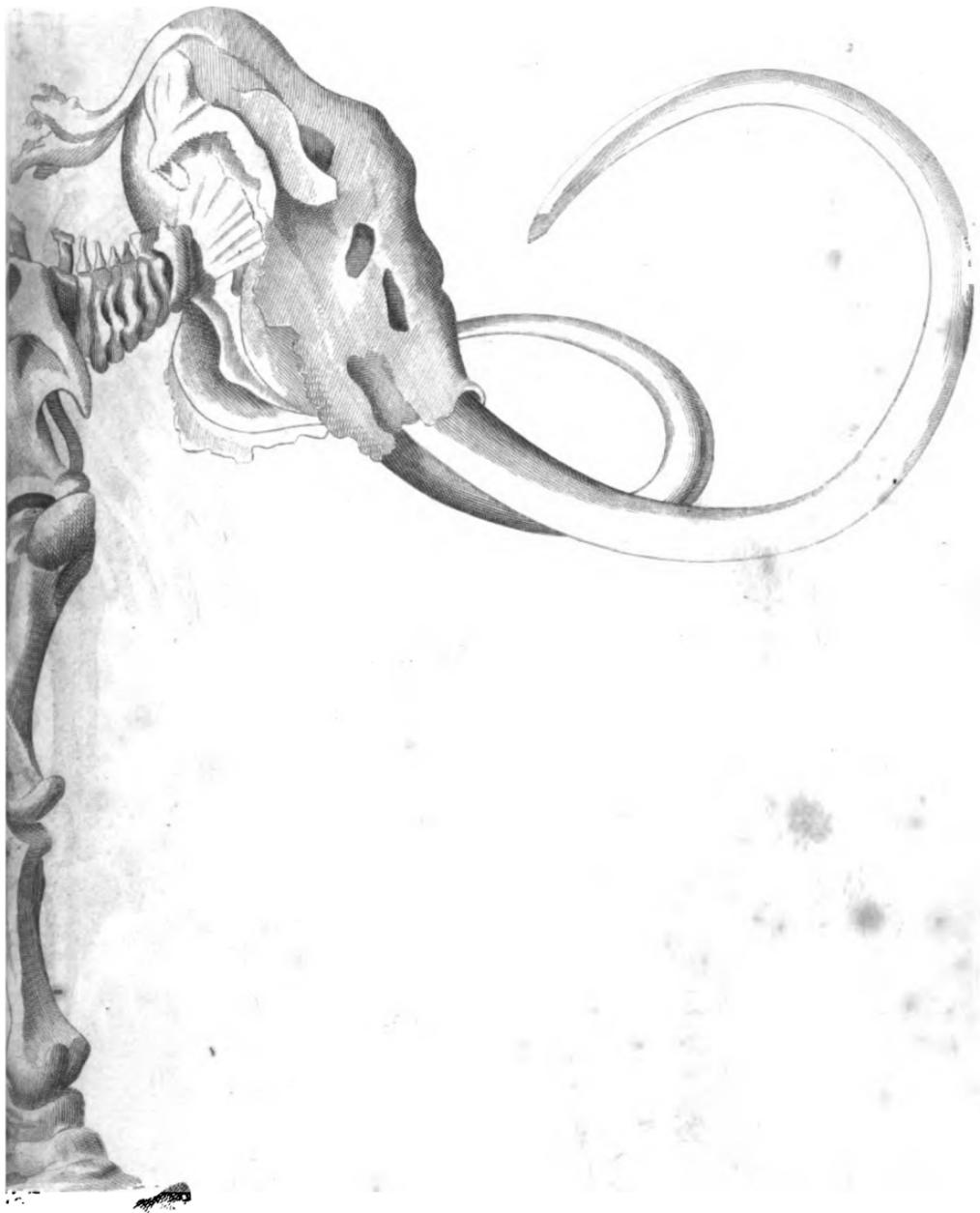




*Trypsil Elephant found in the*

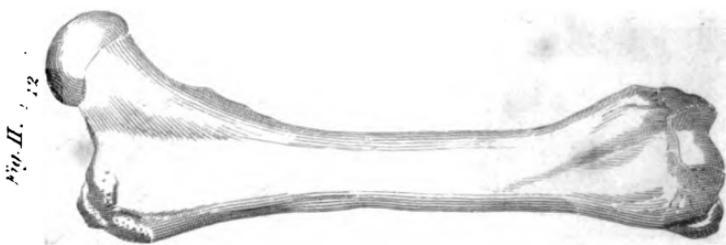
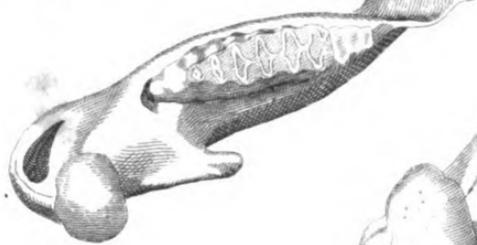
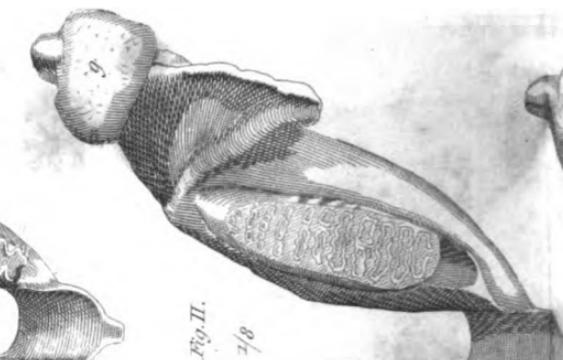
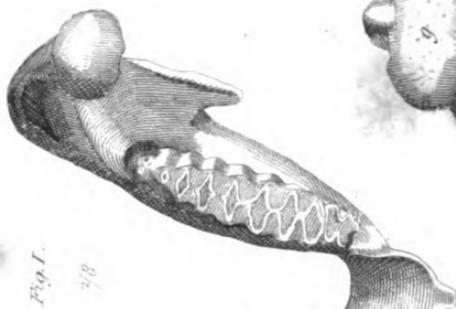


*See, in Siberia, in 1799.*









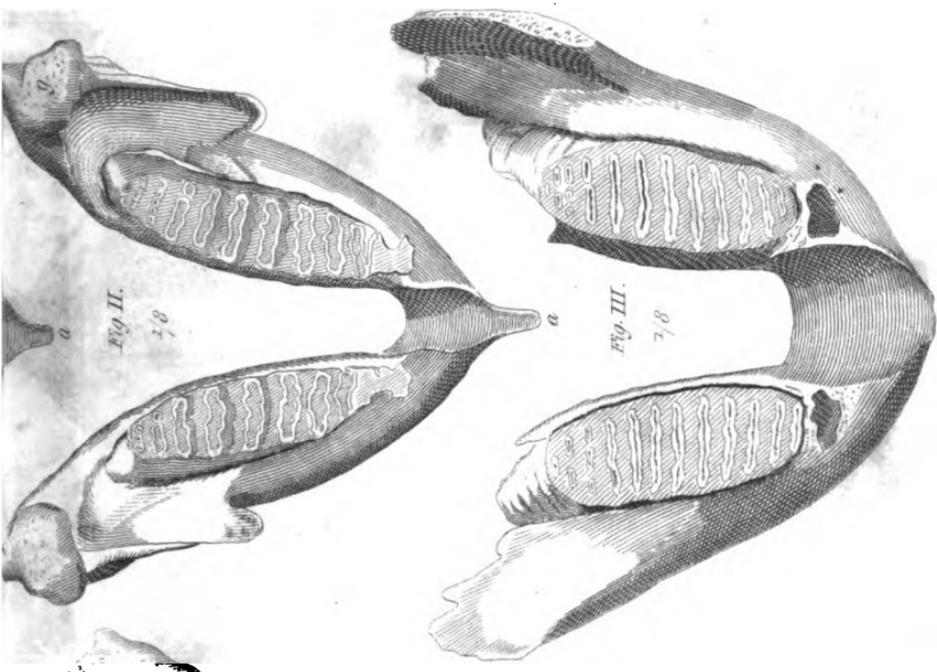


Fig. III. 76



Fig. III. 76

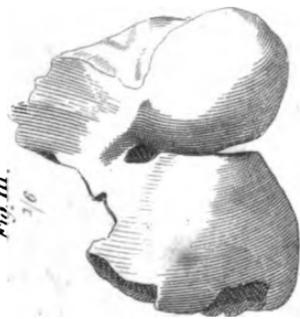


Fig. III. 78

Fig. I. Jaw, Femur, and Lower Head of Human of the African Species

II. The like of the Asiatic Species.

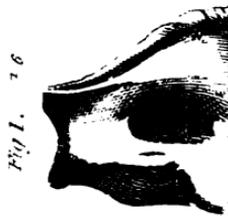
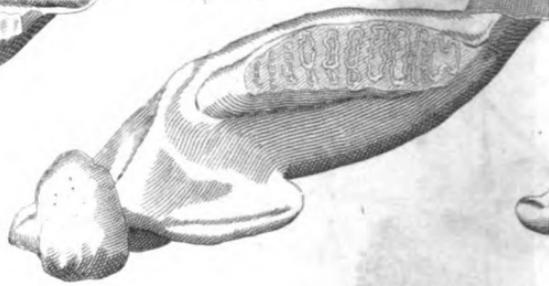
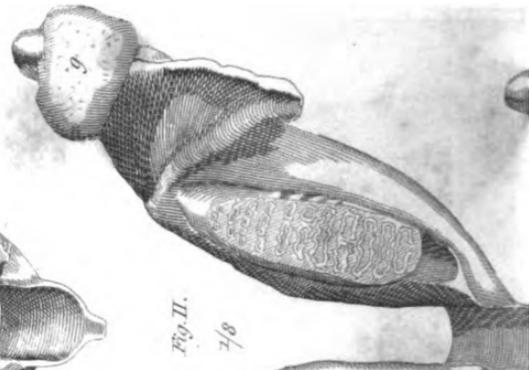
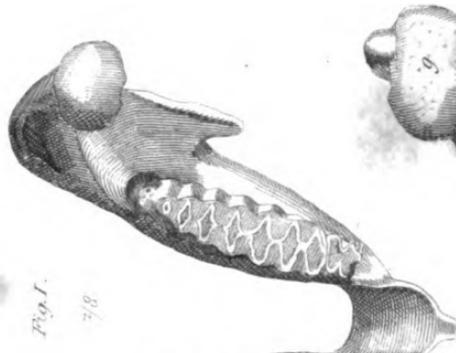
III. The like of the Papia Species.











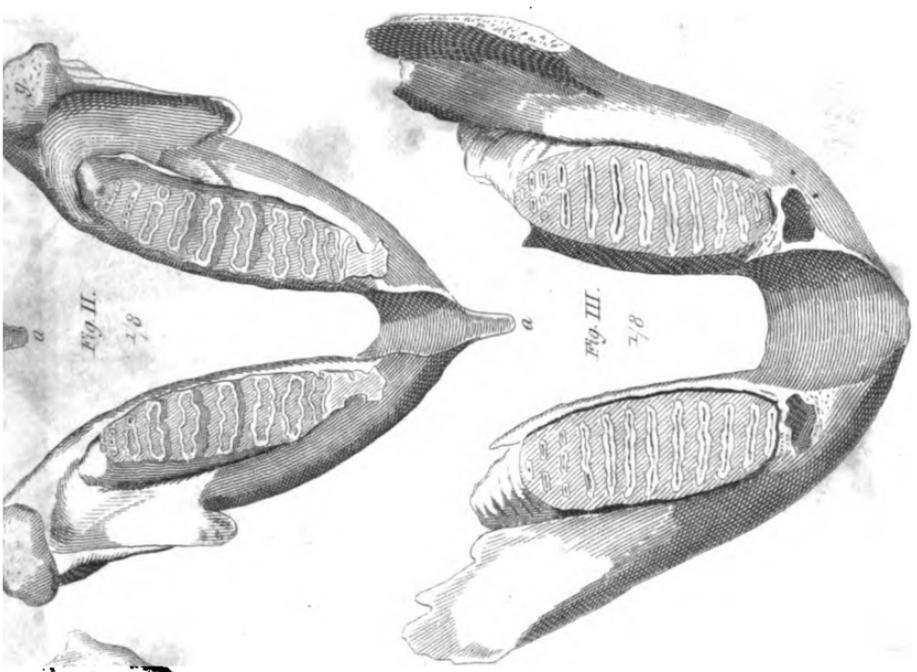
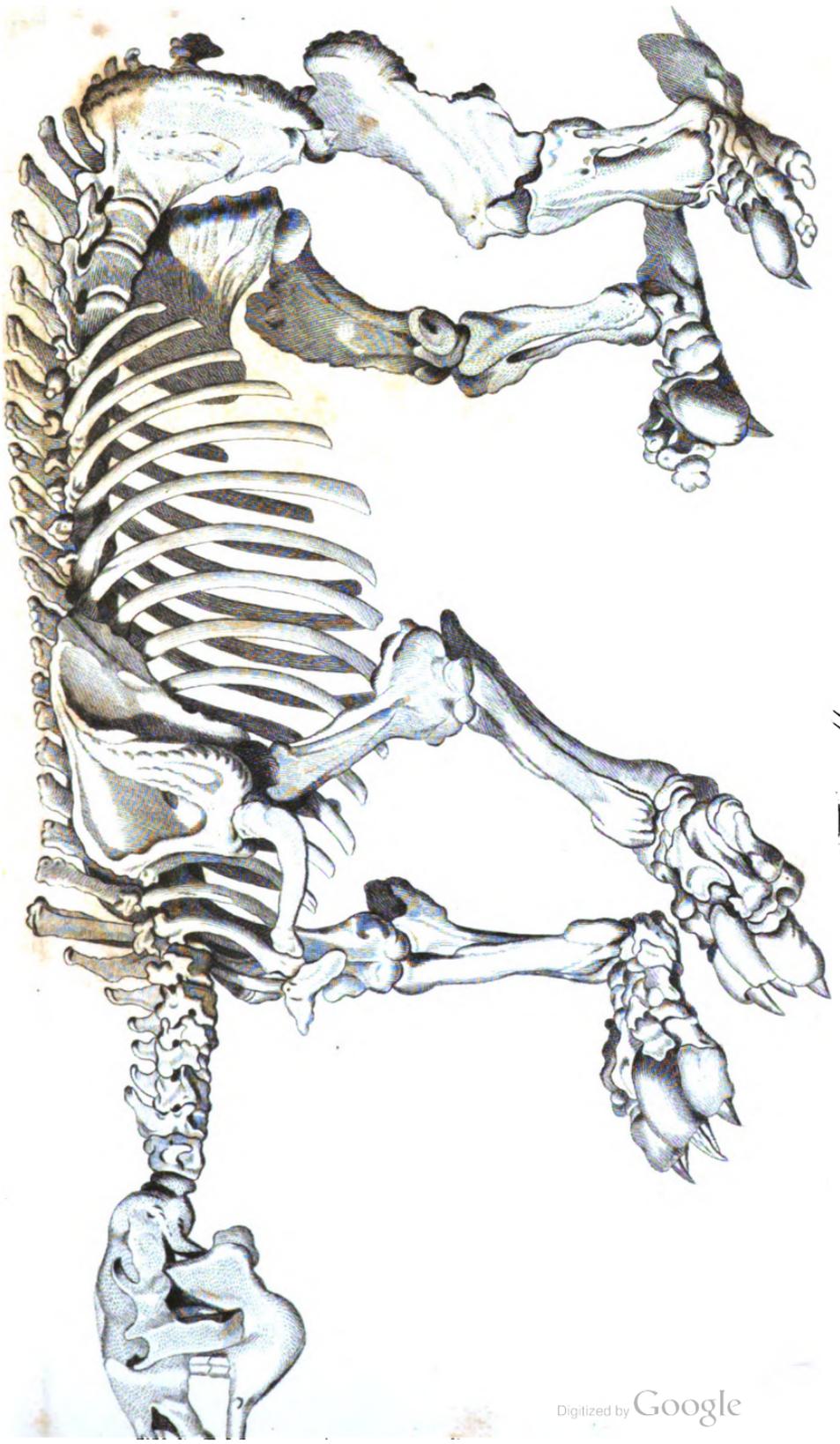
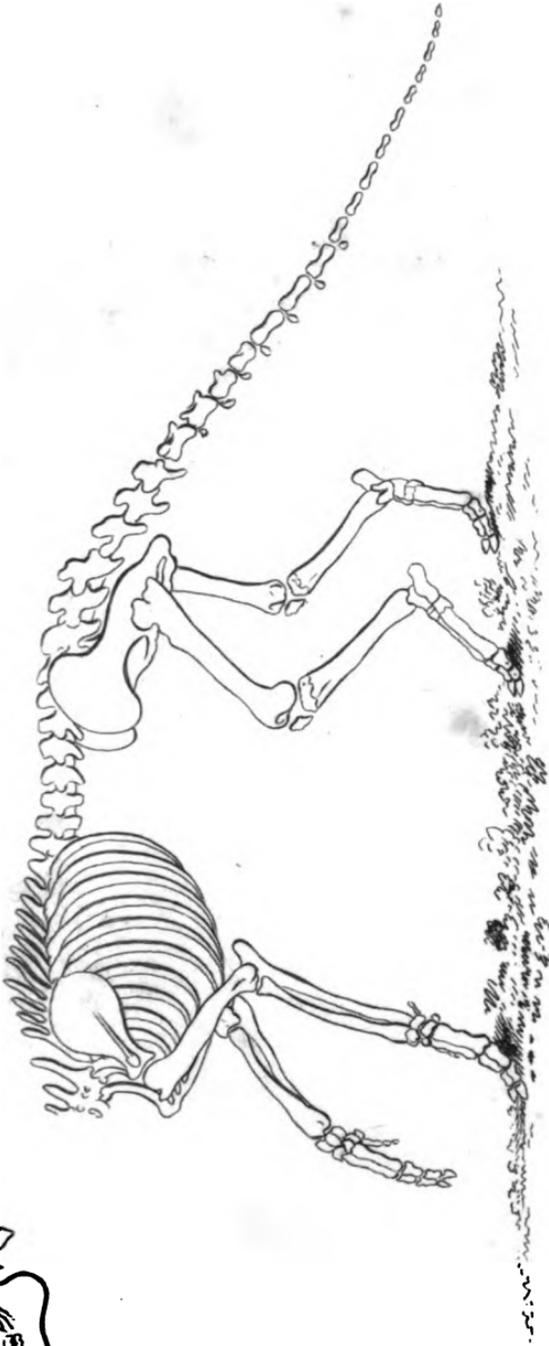


Fig. I. Jaw, Femur, and Lower Head of *Felis*  
 of the African Species  
 — II. The like of the Asiatic Species.  
 — III. The like of the *Fogit* Species.





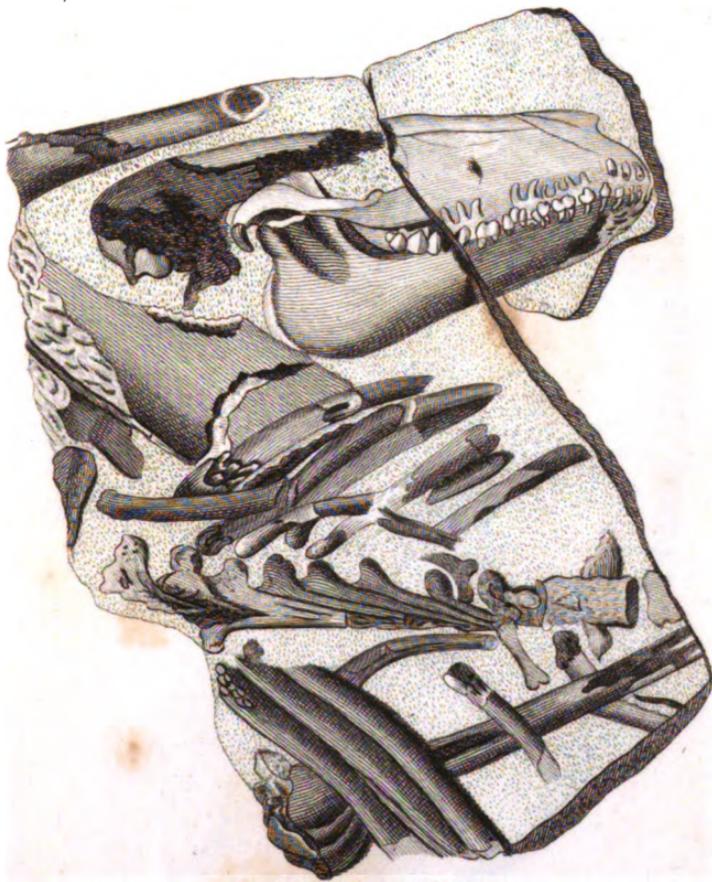




*The Common Anoplotherium restored.*

*Several of the cervical vertebrae have not been found.*

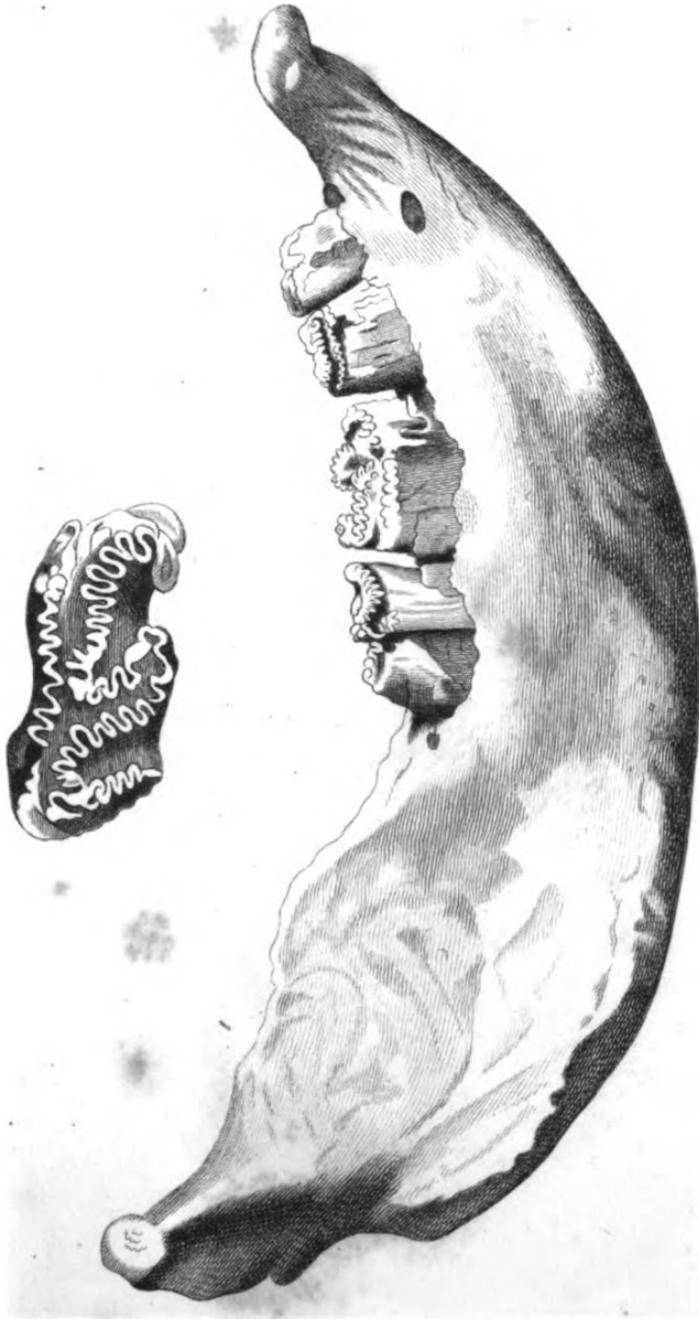




1. Head of the *Anoplotherium* found at Montmartre.

2. Part of Skeleton of *Anoplotherium* found at Antony.

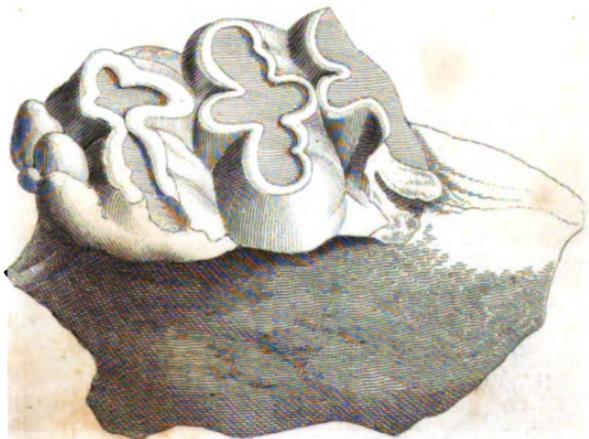
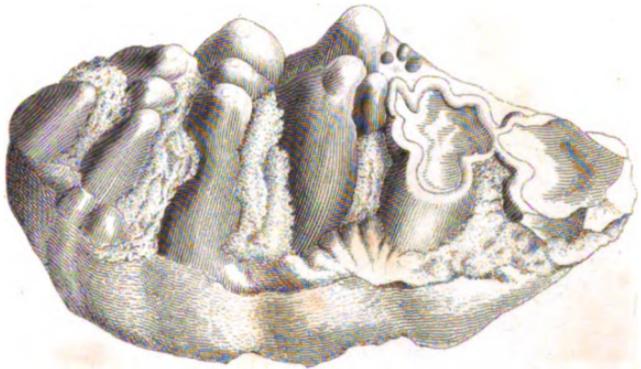
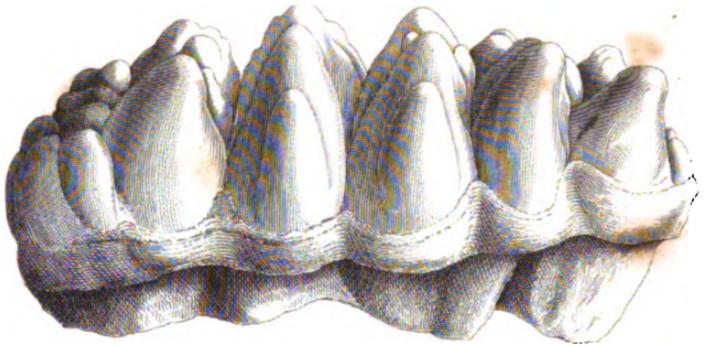




*Jaw and upper surface of Teeth of the Elasmotherium.*

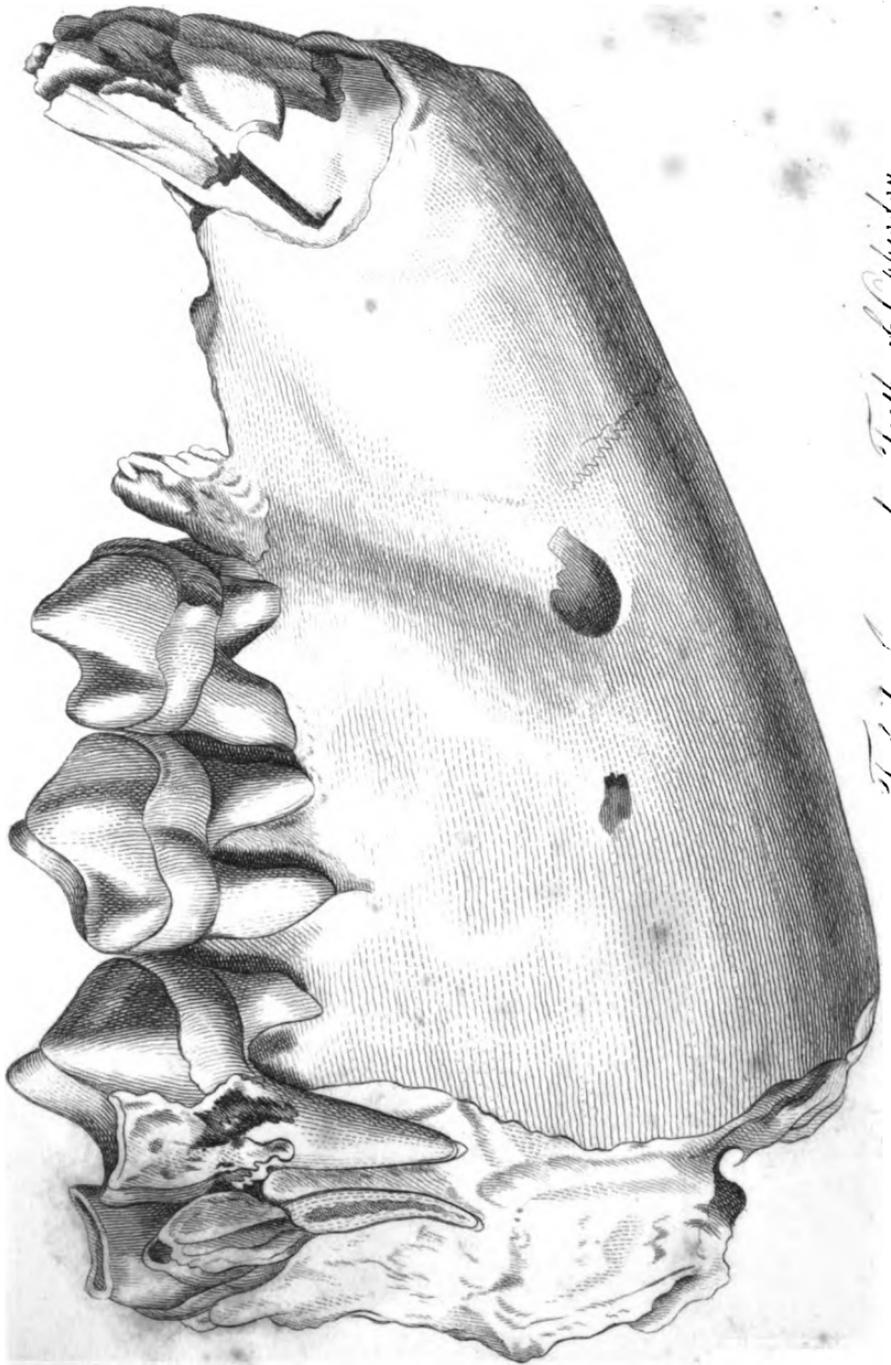


*Mastodon with narrow teeth.*



*Check teeth in different states of deterioration*





*Fig. 1. Jaw and Teeth of Ophiodon.*











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