



076

(ZOOLOGICAL LECTURES,)

delivered at the

ROYAL INSTITUTION

by

GEORGE SHAW, M.D. F.R.S. &c.

WITH PLATES

from the first Authorities and most select specimens

Engraved principally by

M^{rs} GRIFFITH.

76/



VOL. I.

LONDON,
Printed for C. Kennedy, Fleet Street,
1809.

(SHAW'S)

80

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ZOOLOGICAL LECTURES

DELIVERED AT THE

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IN THE YEARS

1806 AND 1807,

BY

GEORGE SHAW, M.D. F.R.S.

&c. &c.

VOL. I.



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1. Dr. SHAW's HISTORY of QUADRUPEDS, COMPLETE. Elegantly printed on very fine paper, in medium octavo, and from their size and great number of plates, divided into Four Volumes, price 5l. 5s. in boards, or on large paper, 7l. 12s. in boards. Vol. I. and II. of GENERAL ZOOLOGY, or Systematic Natural History, by GEORGE SHAW, M.D. F.R.S. &c. &c. with between two and three hundred plates, from the first authorities, or the most select Specimens in the British, Leverian, and other Museums, principally engraved by Mr. Heath.

In the course of this work will be comprised the whole of what is termed ZOOLOGY, or the History of the Animal World. It commenced with Quadrupeds, which is now complete, and will proceed, in systematic order, through all the remaining branches.

It is scarcely necessary to observe, that in this publication particular attention has been paid to the lately discovered animals from New Holland, which, from their highly singular conformation, form so interesting a part of Natural History.

The Linnæan arrangement, with some occasional variations, will in general be pursued, as on the whole most eligible.

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Vol. VIII. of the GENERAL ZOOLOGY, being the second on the subject of BIRDS, will be published speedily.

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SYLLABUS OF LECTURES.

VOL. I.



LECTURE I.

INTRODUCTION. General description of the Animal Kingdom, according to different authors. Linnæan arrangement. Union of animal and vegetable life in Zoophytes, and particularly in Polypes. General description of Polypes.

LECTURE II.

Linnæan arrangement of MAMMALIA or viviparous Quadrupeds. Order *Primates*, comprehending the Apes, Macaucos, and Bats. Vampyres. Order *Bruta*. Bradypus or Sloth. Fossil skeleton, supposed to be allied to this latter genus.

LECTURE III.

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LECTURE IV.

Continuation of Linnæan Mammalia. Elephant. Mammoth. Order *Pecora*. Giraffa or Camelopard, Cervus or Deer, Bos or Ox, Camelus or Camel, Moschus or Musk, Antilope or Antelope, Ovis or Sheep, Capra or Goat. Order *Belluæ*. Equus or Horse, Hippopotamus, Rhinoceros, Tapir, Sus or Hog. *Pinnated Mammalia*. Phoca or Seal. Trichechus or Walrus. *Whales*. General History of the different genera and species of ditto.

LECTURE V.

BIRDS. General description of the anatomy of. Linnæan division of. Order *Accipitres*. Vultures, Eagles, Owls. Order *Picæ*. Hornbills, Toucans, Parrots, Woodpeckers, Paradise-Birds, Kingfishers, Cuckows, and Hamming-Birds.

ADVERTISEMENT.

THE present short course of Lectures is by no means intended as a deeply scientific and elaborate series of zoological disquisitions, but may rather be termed, in the words of Sir Kenelm Digby, "a familiar discourse with Lady-Auditors." The general tenor of the explanations is purposely conducted with as little appearance of the parade of technical terms as possible; and the reader must not expect to find any long dissertations relative to the nature of animal life, any very minute observations relative to the classification of the animal kingdom, and still less any quotations from Aristotle in order to prove that "a man hath ten toes*;" but the whole is merely intend-

* Grew, Mus. Reg. Soc.

ADVERTISEMENT.

ed as a plain illustration of the animal world according to the Linnæan mode of arrangement, with some occasional deviations and transpositions.

It should be added, that these Lectures were accompanied by a very numerous collection of engravings, drawings, &c. in order to elucidate the respective subjects; and, wherever circumstances rendered their introduction possible, by preserved as well as living specimens of the animals themselves.

British Museum,
May 30, 1808.

The reader is requested to pay particular attention to the list of Errata, and to cast his eyes on the Notes and Illustrations.

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fied by the genera of *Blatta*, *Gryllus*, and *Fulgora*. Order *Lepidoptera* exemplified by the genera of *Papilio*, *Sphinx*, and *Phalæna*. Order *Neuroptera* exemplified by the genera of *Libellula* and *Ephemera*. Order *Hymenoptera* exemplified by the genus *Ichneumon*. Order *Diptera* exemplified by the genera of *Musca*, *Culex*, and *Oestrus*. Order *Aptera* exemplified by the genera of *Aranea* and *Acarus*.

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Linnæan *MOLLUSCA Nuda*, or Soft-Bodied Animals, exemplified by the genera of *Limax*, *Aplysia*, *Doris*, *Nereis*, *Pyrosoma*, *Nais*, *Sepia*, &c. Common Cuttle-Fish described. Ink-Fish or Calamary. Eight-Armed Cuttle-Fish. Colossal ditto. Kraken. Genus *Medusa*, exemplified by *Medusa Pulmo*. Genus *Actinia* or Sea-Anemone. Genus *Asterias* or Starfish. Genus *Echinus* or Sea-Urchin.

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Linnæan *MOLLUSCA Testacea*, or Soft-Bodied Animals furnishèd with shells. Division of Shells into Univalves, Bivalves, and Multivalves; with a general description of the nature of the inhabiting animals. Particular description and history of the *Argonauta*

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Argo or Paper Nautilus. Description of the Linnæan genus Nautilus, or Pearly Nautilus. Genera of Dentalium, Serpula, Tereido, and Sabella. Bivalve Shells exemplified. History of the *Mytilus margaritiferus* or Mother of Pearl Shell, of Pearls, of the Pearl-Fishery, and manufacture of artificial pearls. Genera of Spondylus, Chama, and Pinna. Multivalve Shells exemplified by the genus *Lepas* or Barnacle. History of the *Lepas anatifera*, &c. Hatching of shell-animals, and growth of shells.

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LECTURE IX.

INSECTS; general description of. Linnæan arrangement of. Examples of the different divisions. Order *Coleoptera* exemplified by the genera of *Scarabæus*, *Cerambyx*, and *Curculio*. Order *Hemiptera* exempli-

The Vignette represents, in its natural size, an elegant species of Humming-Bird, called the *Trochilus furcatus* or Smaller Fork-Tailed Humming-Bird, seated on a sprig of the *Ipomæa coccinea*.

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microscope.

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LECTURES,

&c. &c.

LECTURE I.

THE study of Natural-History at large, or in all its branches, has of late been so much cultivated, that it seems almost unnecessary to enforce its utility by any particular recommendation. Its importance begins to be understood, and it is generally acknowledged, that, exclusive of its more consequential aims, it has the peculiar advantage of uniting amusement with instruction, and of impressing the mind with a train of the most pleasing ideas while engaged in contemplating the infinitely-varied forms exhibited in the field of Nature, and in tracing their gradations and con-

nexions; and we must readily allow that it is no unimportant object to be able to secure to ourselves some species of study, which in its progress may continue to afford a rational delight, and in the pursuit of which there can be no fear of soon exhausting the subject.

I shall here beg leave to introduce the opinion of one of the greatest and most estimable characters that perhaps ever ornamented this or any other nation. I mean the celebrated Ray, whose dignified simplicity of language enforces with peculiar energy the truth of his sentiment.

“ We content ourselves, (says he) with a little skill in philology, history, or antiquity; and we neglect that which appears to me of much greater moment: I mean the study of Nature, and the works of Creation. I do not mean, (he adds,) to derogate from or discommend those other studies; I only wish that they might not quite jostle out and exclude this; and that men would be so equal and civil as not to vilify or disparage in others those studies they themselves are not conversant in. No knowledge can be more pleasant to the soul than this; none so satisfying, or that doth so feed the mind; in comparison of which the study of

words and phrases seemeth insipid and jejune; for words being but the images of things, to be given up wholly to their study, what is it but to verify the folly of Pygmalion, to fall in love with a statue, and neglect the reality! The treasures of Nature are inexhaustible: there is enough for the most indefatigable industry, the happiest opportunities, the most prolix and undisturbed vacancies."

Such appears to have been the opinion of Mr. Ray.

I shall next observe that the celebrated poet Gray was in a peculiar manner devoted to the study of Natural History; as appears from the testimony of his friend Mr. Mason, who assures us that Gray frequently felicitated himself on having been early introduced to so delightful a science, and which improved in so remarkable a manner the general tenor of his health and spirits. I might also here mention, as a circumstance not generally known, that Gray translated the Linnæan Genera or Characters of Insects into elegant Latin hexameters, some specimens of which have been preserved by his friends, though they were never intended for publication.

Another exalted character, whose hours of leisure from the official employments of his life were devoted to this pursuit, was the learned and accomplished Sir William Jones, whose works bear ample testimony to the attention which he paid to the history of the Productions of Nature.

The mistakes which occasionally appear in the works of various authors, even of the highest celebrity, arising from a want of accurate information relative to the natural subjects of which they are speaking, are numerous and striking; the epithets by which many objects are distinguished, are, for this reason, improperly chosen, and utterly inconsonant with the character of the things intended. This is no where more strikingly illustrated than in the august lines of Milton, in which the description of a sleeping whale is injured by an epithet of all others least according with the nature of the animal.

“ That sea-beast
 Leviathan, which God, of all his works
 Created hugest that swim th' ocean stream.
 Him haply slumb'ring on the Norway foam
 The pilot of some small night-founder'd skiff,

Deeming some island, oft, as seamen tell,
With fixed anchor in his scaly rind,
Moors by his side under the lee, while night
Invests the sea, and wished morn delays."

But none of the whale-tribe are furnished with scales, or any thing analogous to them. It must be acknowledged, however, that this observation may appear a mere piece of hypercriticism, and that Milton by the expression of *scaly rind*, might only mean rough or scaly, in the same sense that those epithets are often applied to the bark of a tree, or any other irregular surface. There can be little doubt, however, that real and proper scales were intended by the poet, nor is it difficult to discover the particular circumstance which impressed Milton with this erroneous idea, viz. a figure in the works of Gesner, so injudiciously expressed as to appear on a cursory view, as if coated with large scales, with a vessel near it, and an inscription above it, importing that sailors often mistake a whale for an island, and thus endanger themselves by attempting to anchor upon it. As the general learning and extensive reading of our great poet are so well known, it can hardly be doubted that he was conversant with the writings of Gesner,

whose work was then the great depository of natural knowledge, and that the figure and description there given left a lasting impression on his mind. It must be confessed also that the poet was here deceived by the naturalist.

A modern writer, having occasion to allude to the dormant state of the Butterfly and Moth tribe, during their period of imperfection, has evidently shewn that he supposed the animal to become a chrysalis after having appeared in its complete or flying state, and has thus entirely inverted or reversed the real progress of the animal.

“ Thus the gay Moth, by sun and vernal gales
 Call'd forth to wander o'er the dewy vales,
 From flower to flower, from sweet to sweet will stray,
 Till, tir'd and satiate with her food and play,
 Deep in the shades she builds her peaceful nest,
 In lov'd seclusion pleas'd at length to rest :
 There folds the wings that erst so widely bore ;
 Becomes a household Nymph, and seeks to range no more.”

A curious example of ridiculous ignorance relative to such subjects, might be taken from some of the public papers for the month of July 1794, in which we were informed that in the neighbourhood (I think) of Sheffield, were found (in the



Weyl's work

PHALENA VINULA

1808 Oct. London. Published by G. Kearsley Fleet Street.

words of the describer) "two strange phænomena of Nature, whose bodies were green, and covered or slated over, in regular and exact chesses, representing shell-work: the heads of these animals were exactly like that of a Lion, and upon the slightest touch, it darted out two spears behind, of the finest scarlet colour, and at the same time one before, which was white, and shaped like the paw of a bear: they had each of them fourteen legs, and on each side the back of these wonderful creatures, was the representation of the animal itself, in perfect white, which shone like silver."

It is extremely easy to all who are conversant in the history of insects, to guess what these formidable monsters must have been: viz. a brace of harmless Caterpillars, of a species, singular indeed in appearance, but by no means very uncommon, and which do, by a slight aggravation, in some degree justify the description of the observer.

A few years ago, a description, (accompanied by a figure,) of one of the most common insects in England, but in its first state, (in which it always resides under water) was given, with much solemnity, in a periodical publication, (the Gentleman's Magazine) and was considered by its describer,

who, I believe, was the late Mr. Philip Thicknesse, as a new, and till then unheard-of animal, of which he believed himself to have been the first describer.

To a total ignorance of the real nature of animals (excusable in ancient times, but not so in modern) must be attributed the numerous histories of showers of frogs and mice, and other animals; the raining of blood; the change of certain Frogs into Fishes, and back again from Fishes to Frogs, with many other particulars equally extravagant; and from these and many other instances which might be adduced, we may perceive what mistaken notions may be adopted by those, who otherwise well informed, happen to have paid little or no regard to the general doctrines of Natural History.

Natural History at large, divides itself into what are called the three Kingdoms of Nature; viz. the animal, the vegetable, and the mineral kingdom.

Of these the Zoological or animal kingdom is what naturally engages our first attention, and seems to claim a superiority over the rest. It would be unnecessary to add, that Zoology comprizes the *whole* animal world, or all those beings which are called by the name of Quadrupeds, Birds, Amphibia, Fishes, Insects, Testaceous

animals, and Zoophytes, which latter are of very various forms, and are allied by many resemblances to the vegetable world.

In taking a survey of the animal world, we may either commence with the highest order of animals, and gradually descend from our own species to the minutest animalcules visible by the assistance of the microscope; or from these minute points, as it were, of existence, to Man himself, the chief of Creation here below.

I must observe, that it may be greatly doubted, whether it be practicable to make out a continued natural chain or series of animals, united throughout by evidently connecting links; at least, all attempts of that kind have hitherto failed; and the animal world, and indeed all the productions of Nature, seem rather connected by many points of affinity on different sides, than by a regular chain of gradation; so that, as the learned Dr. Pallas has well observed, the face of nature may rather be said to represent a reticulated or polygonal surface, than to be disposed in a continued linear progression.

But though a perfectly natural chain or arrangement of animals cannot be contrived, it is still necessary to form some kind of classification, in order

to keep together such tribes as most evidently resemble each other. Naturalists have therefore invented several systems or distributions of animals; formed, either from the general external appearance, or from the structure of the principal internal organs.

The most ancient division of animals, (exclusive of the slight sketches to be found in some parts of the sacred writings,) is that of Aristotle, who divided animals into *viviparous* or such as produce living and perfectly-formed young, and into *oviparous*, or such as produce eggs, from which the young are afterwards excluded. This distinction of animals was not conducted with perfect exactness, and Aristotle himself was sensible that it was liable to some exceptions, and that it contained certain inaccuracies. It continued however to be in use, with some modifications, till towards the decline of the seventeenth century, when our famous Mr. Ray formed a new classification of animals, founded chiefly on the structure and nature of the heart and lungs in the different tribes; and the Linnæan arrangement of the animal kingdom still acknowledges that of Ray for its basis; particularly with respect to quadrupeds.

The great or general Linnæan outline or arrangement of the animal world is thus distributed.

First, into such animals as have warm red blood, and a heart divided into two cavities, or ventricles, as anatomists term them. These animals consist of Quadrupeds and Birds; the former being viviparous, or producing living and ready-formed young, and the latter or birds being oviparous, or producing eggs, from which the young are afterwards excluded.

The next division consists of such animals as have a heart with a single cavity or ventricle, while the blood, though red, is of a far lower temperature than in quadrupeds and birds; insomuch that it is commonly said to be cold blood. These animals consist of what Linnæus calls Amphibia, such as Tortoises, Frogs, Lizards, and Serpents, and in the next place, of Fishes. The former of these subdivisions, or the Frog, Tortoise, Lizard, and Serpent tribes, have what Linnæus terms arbitrary lungs, or such as can suspend respiration at pleasure, for a considerable time, without injury to the animal. The latter tribe, or that of Fishes, instead of lungs, is furnished with what are

commonly called gills, in which innumerable divisions of blood-vessels are disposed in semicircular ranges.

The third order or great division of animals consists of such as Linnæus supposes to have a heart with a single cavity, and a cold whitish or nearly colourless blood. These animals consist of Insects, and of a very numerous and diversified tribe, called, in a large acceptance of the word, by the name of Worms. The former of these tribes, or that of Insects, is distinguished by the particular organs called antennæ, and resembling small horns; while the latter tribe, or that of Worms, is distinguished by having tentacula or flexible feelers. Modern observations seem to prove that the former of these divisions, or *Insects*, have, in reality, no true or regular circulation: this however is a point which I confess I consider as by no means completely ascertained.

Since the establishment of the Linnæan arrangement, so captivating appears to have been the study of system-making, that numerous arrangements have been attempted in different parts of the animal kingdom; more particularly within a

few years past. It may however be much doubted whether the study of Natural History has been greatly advanced by their institution.

It is impossible not to allow some degree of justice to the complaints uttered on this subject by an ingenious naturalist in a neighbouring nation, who thus expresses his sentiments.

By what fatality does it happen, that the beautiful and elegant science of Natural History is become an assemblage of systems, of methods, and discussions of nomenclature, as dry and tedious as they are idle and unnecessary? How can it happen that men of any sterling sense should spend their time in endeavouring to reduce into geometrical divisions the beautiful gradations of Nature, and to be the slaves to arbitrary and petty arrangements, which rise and perish, like so many mushrooms, and which appear to be of no other effect but to disgust and fatigue those who are doomed to study them? When shall we see a stop put to that inundation of new and barbarous words and terms, which deform and disgrace almost all our new works on Natural History, and which threaten to reproduce the scholastic jargon of the

ages of darkness? A certain methodical arrangement is indeed absolutely necessary in the science of natural history; but it is by no means necessary to obscure an easy and elegant study by the introduction of innumerable harsh and ill-constructed technical terms, and to sacrifice every grace and elegance of language to the desire of torturing Greek into bad French, and to substitute unintelligible awkwardness for elegant explanation. It is certain, continues this author, that neither Arnoldus de Villa Nova, nor Raymond Lully, or any other among the old masters of the study of Alchemy, ever introduced a diction more barbarous, or terms more repulsive, than some of our modern managers of systematic Natural History.

I give this quotation as a proof of the ridicule to which the spirit of minute arrangement, so much admired among the lower order of naturalists, has of late unthinkingly exposed itself. I hope, however, that the author had no intention of glancing at the celebrated Monsieur Cuvier, whose arrangement of the animal kingdom, notwithstanding the unnecessary minuteness of some of his divisions, must be allowed to possess a very

high degree of merit, and perhaps may be allowed to be the most truly philosophic that has yet been seen.

Monsieur Cuvier divides the whole animal world into what he calls *Vertebrated* and *Invertebrated* animals; that is, such as are furnished with a back-bone, divided into the joints called vertebræ, and forming a case or guard for the spinal marrow, and into such as are destitute of this series of bones, and are therefore Invertebrated animals. His first class, viz. the *Vertebrated* animals, are subdivided into such as have warm blood and a heart with two cavities or ventricles, and into such as have comparatively cold blood, and a heart with one ventricle. In the first division then of Vertebrated animals rank Quadrupeds and Birds, and in the second, or such as have cold blood and a single ventricle, rank the Linnæan Amphibia and Fishes.

The second great class, consisting of the *Invertebrated* animals, or such as are destitute of the spine or back-bone, is divided into such as have a system of blood-vessels for the purpose of circulation, and such as have none.

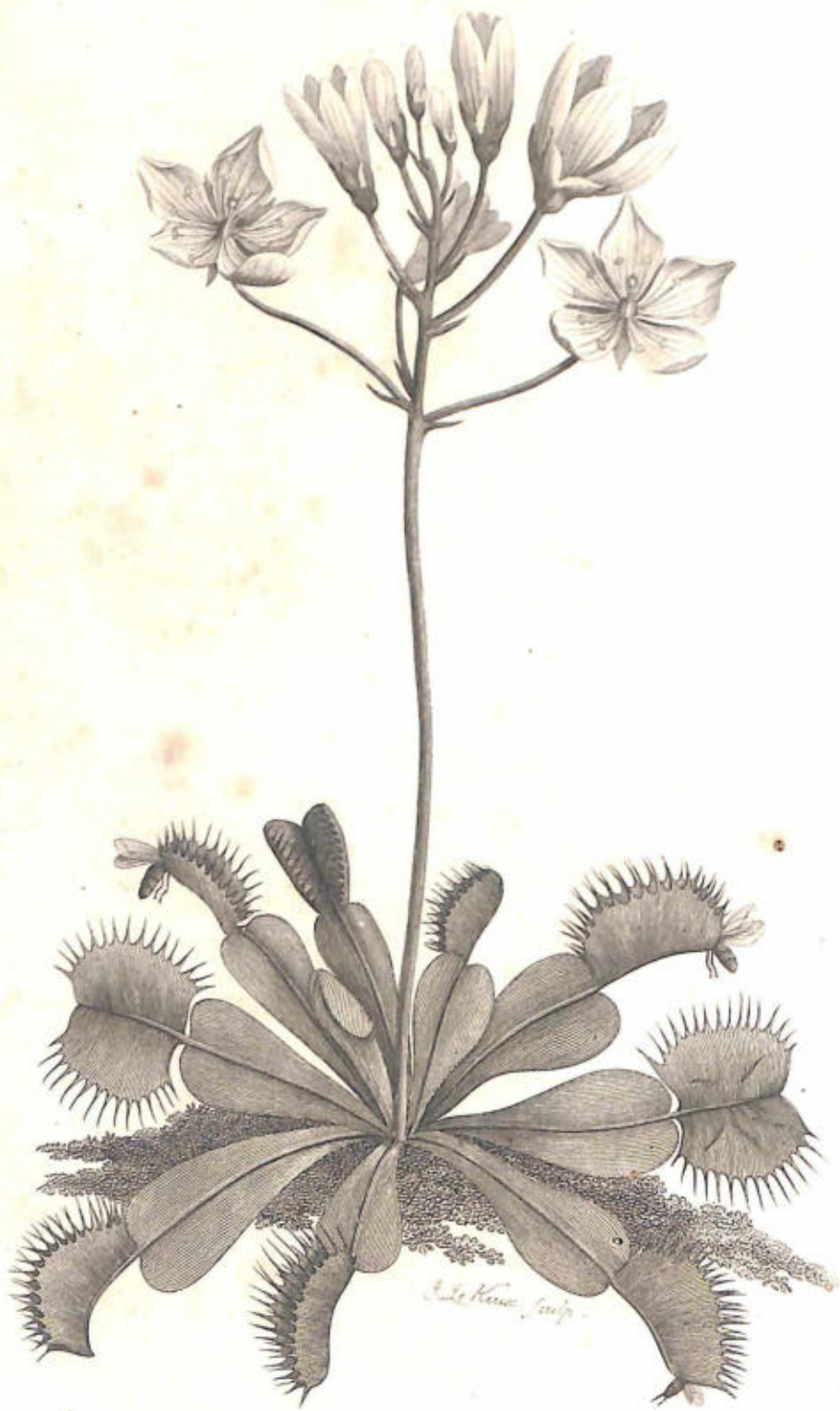
The first of these divisions, or that consisting of

animals furnished with blood-vessels, contains the major part of what Linnæus calls Mollusca or soft-bodied animals, and also all the Crustacea or such as are furnished with a moderately hard or crustaceous covering. In the second division of Invertebrated animals, are contained those which are supposed to be destitute of a regular system of blood-vessels; these animals are Insects and Zoophytes; Monsieur Cuvier not allowing a circulation of the blood in insects, and in the animals called Zoophytes, it has certainly never been observed.

Such is the general outline of Monsieur Cuvier's Zoological System.

His institution and arrangement of the various genera of animals, under each more particular division of his system, is conducted with great anatomical precision, and evinces the highest degree of philosophical knowledge of animals; but the whole arrangement has a somewhat complicated and forbidding appearance to a general reader, and is of course less immediately attractive than the more simple arrangement of Linnæus.

Animals are, in general, sufficiently and readily



DIONÆA MUSCIPULA

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distinguished from vegetables, and there are few instances in which we can suppose a person in the least danger of confounding them. Yet there are many indistinct approximations between animals and vegetables, exclusive of the real or acknowledged connecting links. Thus there are many animals which are nearly as torpid as the major part of vegetables: and again, there are some vegetables which seem almost to trench upon the properties of animals, by their peculiar motion on being suddenly irritated; thus, the *Dionæa Muscipula*, or Venus's Fly-Trap, an American plant, well known to all who are conversant with the science of Botany, is furnished with leaves possessed of so strong a degree of irritability, as to confine, by their sudden contraction, any small animal which happens to alight upon them; and the *Hedysarum gyrans*, an East-Indian plant, of the papilionaceous or pea-bloom tribe, seems to possess a kind of voluntary motion in the small leaves situated on each side the base of the larger ones. In general, however, the distinction between animals and vegetables is too striking to admit of any hesitation, and it would be a mere loss of time, in the short space allotted to our pre-

sent course of Lectures, to enter, with any degree of minuteness, into the history of the possible cases in which a doubt might be supposed to arise between the two kingdoms, to which such particular subject should be supposed most properly to belong.

The limits of animal and vegetable life are generally allowed to concur or unite in those extraordinary beings called *Zoophytes*, and above all others in those *Zoophytes* called *Polypes*, of which four different species have been discovered in our own country, as well as in many other parts of Europe. They are small water animals, of a very tender substance, and furnished at the upper part with several long and slender arms, with which they seize their prey: the body is of a lengthened and tubular form, and the whole creature possesses, in a very high degree, the power of extending or contracting itself at pleasure. It produces its young principally by a species of vegetation; certain small swellings or tubercles appearing at intervals on different parts of its body, which, in the space of a few days, become complete, and resemble the parent animal in every respect except that of size. When thus fully formed, they

drop off from the body of the parent animal, and attach themselves to any convenient substance: it often happens that a Polype shall be loaded, not only with a primary but a secondary offspring, the young animals themselves, before their separation from the parent, producing others in a similar manner; so that the whole may be compared to a kind of genealogical tree. These creatures are highly voracious, and possessing, as before observed, a very high degree of contractile and extensile power, are capable of swallowing other animals of far larger size than themselves; the tubular body of the Polype enlarging in order to receive them. The act of seizing their prey is very sudden and violent, but their mode of swallowing or absorbing it is very gradual. When a Polype is cut into two or three pieces, each piece, in the space of a few days, especially in warm weather, becomes a perfectly complete animal, by the reproduction of every part deficient. Thus, if a Polype be cut into three pieces, the office of the head or upper part is to produce a new extremity or tail, with its sphincter-muscle; of the tail part to produce a new head and arms; and of the middle part to produce both extremes. It there-

fore cannot be doubted that the Polypes do really constitute the connecting link between animal and vegetable life.

The figures of the Polype, selected for our present inspection, are from the work of the celebrated Roesel; and represent with great elegance and fidelity, the appearance of these extraordinary animals, both in their natural size, and magnified by the microscope. The species in these figures of Roesel are the *Green*, the *Brown*, and the *yellowish-Grey* Polype.

These most curious and interesting animals were first fully described by a Monsieur Trembley, of Geneva, who, about the year 1730, happened to discover them in searching after some small aquatic plants. They had indeed been discovered long before by the celebrated Leewenhoeck, who gave a general description of the animal, and observed that it multiplied by an apparent vegetation; but it was reserved for Monsieur Trembley to discover and describe, in an ample and circumstantial manner, all its extraordinary properties. Monsieur Trembley happened first to observe the small green Polype, or *Hydra viridis*, and being greatly surprised at the appearance of a creature, which had



W. G. S. P.

POLYPE S
the middle figure magnified

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at once the aspect of a plant, and the motions of an animal, determined to try the experiment of cutting it in two, in order to ascertain its doubtful nature; and was beyond measure astonished to find that instead of destroying it, both parts seemed uninjured by the wound, and that, in a very few days, each had reproduced every deficient organ, and that each animal seized its prey, and moved about as before.

This striking discovery, being announced, was at first considered by many as a fable; and it was even contended, that this division of animal life was in itself absolutely impossible upon the principles of common sense, as well as of sound philosophy: but, at length, the attention of philosophers in every part of Europe being excited by the singularity of the circumstance, the animals were every where sought after, and experiments made by cutting them in every possible direction. Their real nature was thus completely ascertained; and, from subsequent experiments, it was found, that in reality many other tribes of the inferior animals were likewise possessed of the power of reproduction, though in a less striking degree; and thus a wide field of philosophical investigation was sud-

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denly opened, which may be said to have constituted a new era in the science of Natural History.

In warm weather so rapid is the multiplication of the common Polype, that the descendants of a single animal are supposed to amount to several thousands in the course of a single summer.

An ingenious observer in our own country, soon after the first account of Monsieur Trembley's discoveries had been published, made the following observations, which I shall give in his own words.

“ A single Polype, say she, was put into a glass by itself, on the 12th of July, with two intentions, viz. first, that I might learn how long-lived the creature is, and at what rate it produces branchers. It is still alive in this present week of September; and goes on to produce at least five in a week, one week with another. But, because this Polype had the appearance of a young one on it when I first set it apart, (which young one was separated by falling off from the parent in three days' time,) I was willing to make trial how long it would be before a young Polype might be expected, provided the old one was without any appearance of a bud, and was itself only of moderate growth. Accordingly I took such a one, which was a brancher

from the first-mentioned animal, and put it into a glass by itself on the 23d of July, and in a week's time it produced a young one, and since that time produces at the rate before-mentioned, viz. five in a week. Soon after, I sent to a friend well skilled in figures, to desire him to make a computation of the number a single Polype would produce in a year's time, and on the moderate supposition, that, (a week being allowed for every brancher when separated, before it begins to produce,) it be supposed afterwards to produce one in three days. But he informs me that there exists no rule by which such computation can be made; that it is in itself extremely difficult, and that, after all, mistakes might arise in such a multitude of figures as would be necessary; but that he went so far as to calculate the number of the second generation, which amounted to more than eleven thousand. What then, says he, must be the amount of the whole!"

The objections made at the time of the first discovery of the extraordinary power of reproduction in the Polype were chiefly these. If the animal soul or life, said the objectors, be one indivisible essence, all in all, and all in every part, how comes it in this animal, to endure being divided several

times, and yet continue to exist and flourish? Again, if animal identity consists in consciousness, and if every living creature is sensible of pleasure and pain, or in other words, has a consciousness, which is generally thought a reasonable supposition; when the Polype is divided into several parts, which all become perfect Polypes, where shall we find the identity of the original animal?

A letter dated from the University of Cambridge, inserted in the Philosophical Transactions, reasons thus on the subject.

The last news from Paris gives us something very surprising; viz. that an animal called the Polypus is of such a nature, that life is preserved in it after it has been cut into several pieces, so that one animal seems by section to be immediately divided into two, or three, or more complete animals, each separately enjoying life, and continuing to perform all the usual operations of its species. Such an account would have been less regarded, had we not been informed that letters avouching the reality of the fact had lately been communicated to the Royal Society, and that its reality had also been confirmed by some of our best observers.

Some of our friends, who are firmly attached

to the general metaphysical notions we have formerly learned, reason strongly against the possibility of such a fact; but, as I have myself formerly confessed my distrust of the truth of some of those principles, I shall now make no scruple of acknowledging that I have already seen so many strange things in Nature, that I am become very cautious in affirming what may, or what may not possibly be. The most common operations of Nature in the animal and vegetable world are all in themselves astonishing, and nothing but daily experience and constant observation makes us see without amazement an animal produce another of the same kind, or a tree blossom, and produce leaves and fruit.

The same observation, and daily experience, make it also familiar to us, that, besides the first way of increasing vegetables from their respective seeds, they are also increased by cuttings; and every one knows that a twig of a willow, cut off, and placed in the ground, does presently take root and grow, and by degrees becomes as much a real and perfect^d tree as the original one from which it was taken.

Here is then, in the vegetable kingdom, a familiar instance of the very example hitherto un-

known in the animal kingdom. The best philosophers have long ago observed very strong analogies between these two classes of Beings, and the moderns have every day found reason to extend that analogy; and some have even talked of a scale of Nature, in which, by an insensible transition, a connexion is made from the most perfect of animals to the most imperfect of vegetables. Now in such a scale who shall say, *here animal life entirely ends, and here the vegetable life begins? or just thus far, and no farther, one sort of operation goes, and just here another quite different sort takes place?* Or again, who will venture to say, Life in every animal is a thing absolutely different from that which we dignify by the same name in every vegetable? and might not a man even be excused if he should modestly doubt whether vegetables may not themselves be considered as a very low and imperfect tribe of animals, as animals might, in like manner, be considered as a more perfect and exalted kind of vegetables?

At our next meeting I shall proceed to give a general description of the different tribes of the animal kingdom.

LECTURE II.

WE have already seen that Linnæus has arranged the whole animal world into three great divisions; the first containing such animals as have warm red blood, and a heart divided into two cavities, or ventricles; the second containing animals with cold red blood, and a heart with one cavity only; and the third consisting of animals with pale or colourless cold blood, and a heart (as Linnæus imagined) furnished with a single cavity.

The secondary or more particular Linnæan distribution of Animals is thrown into six divisions, the first of which is entitled *Mammalia*, comprehending such animals as suckle their young, being furnished with proper organs for that purpose. The second division comprises *Birds*. The third the *Amphibia* in the Linnæan sense of the word, comprising the Lizard, Tortoise, Frog, and Ser-

pent tribes. The fourth division comprehends *Fishes*; the fifth *Insects*, and the last *Worms*, which latter term is to be received in a very extended signification; comprising a great multitude of Animals which, in common language, bear very different titles.

With some occasional variations and transpositions, the Linnæan distribution of animals will be that by which we shall regulate our own survey of the animal world; and we shall, of course, begin with Quadrupeds or Linnæan *Mammalia*. The old and generally received English term Quadruped, means, as every one knows, a four-footed animal; and it is evident that it will apply to a Lizard, a Tortoise, or a Frog, as well as to the higher order of Quadrupeds, or such as are generally called four-footed Beasts. It was therefore absolutely necessary to fix upon some term which should sufficiently distinguish the viviparous from the oviparous quadrupeds; and Linnæus accordingly instituted the expressive term *Mammalia*, meaning such animals as are furnished with organs for suckling their young. This (except in one doubtful instance) sufficiently distinguishes Quadrupeds of the higher order, or four-footed Beasts, from the

oviparous quadrupeds, which we shall find to be more properly referred to the Linnæan Amphibia. Among the Mammalia we must not be surprised to find all the kinds of Whales arranged; it being well known that those animals nourish their young by suckling them, in the manner of other Mammalia; and that in the structure of their skeleton and internal parts, they resemble quadrupeds and not fishes; so that they may be considered as Mammalia in the disguise of Fishes.

The doubtful instance which I just mentioned is exemplified in that most singular animal called the Duckbill: a native of New-Holland, and discovered but a very few years ago. In this animal we have the appearance of an indistinct alliance to very different tribes, since the bill or snout resembles that of a Duck, and, upon the strictest examination that has yet been made, no appearance of teats has been discovered in the female; so that if the animal be really destitute of those organs, it cannot belong to the Linnæan Mammalia, the grand or essential character of which consists in being provided with them.

The general characters of the Mammalia at large are the following.

The plan or fabric of their Skeleton, as well as of their internal organs, bears a degree of general resemblance to that of Man.

Their outward covering consists, in general, of hair; but in some few, the animal matter or substance of the hair takes the form of distinct spines or quills, as in the Porcupine and Hedgehog tribe, and in a highly curious species of Ant-Eater discovered in New Holland, and called the aculeated Ant-Eater, or Porcupine Ant-Eater. In other Mammalia the same substance is expanded into the appearance of very strong and broad scales, as in the quadrupeds of the genus *Manis* or Pangolin, which from its general appearance has obtained the improper title of the Scaly Lizard; though no other-wise allied to the Lizards; being a genuine viviparous quadruped, and consequently belonging to the Linnæan Mammalia; and lastly, in one set of Mammalia, called Armadillos, instead of hair, which is only sparingly scattered over some particular parts of the animal, we meet with strong bony zones or bands, forming a regular suit of armour, and securing the animal from all common injuries.

The instruments of loco-motion, or feet, in the

Mammalia are generally four in number, and furnished with separate toes, or divisions, guarded by claws, more or less strong in the different tribes. In some, as in the Monkeys, the feet have the appearance of hands; and the claws often bear a great resemblance to the human nails, for which reason these animals have sometimes been called *Quadrumanes*; as having four hands, rather than four feet*. In some tribes of Mammalia the feet are armed or shod with strong hoofs, either quite entire, or cloven or divided. In such of the Mammalia as possess the power of flight, as in the Bat tribe, the fore-feet are drawn out into slender fingers of an immoderate length, and united by a common membrane or web. In some of the aquatic Mammalia, as the Seals, for instance, both the fore and hind feet are very strongly or widely webbed; and in the Whales, there are in reality only two feet, the bones of which are inclosed in what are commonly called the fins, while the lobes of the tail in some degree answer the purpose of a pair of hind-feet, but consist merely of strong

* The celebrated Cuvier in particular has adopted this name, which indeed has often been applied to such animals by many prior writers.

muscles and tendons without any internal joints or bones.

The arms, or offensive and defensive weapons of the Mammalia, besides the claws and teeth, (which will be afterwards particularized,) are principally the horns; inserted in various directions, and on different parts in the different tribes. The horns are either perennial or annual. In the Rhinoceros the horn is perennial, and situated on the top of the nose. In the Deer tribe the horns are annual, branched, covered while young, with a soft villous skin or coat; they grow from the tip, and become very solid and strong at their full size. In the Ox tribe, as well as in the Sheep and Goat, they are hollow, mounted on a bony core, and grow from the base. Besides the assistance which they derive from horns and claws, the Mammalia have many other modes of defence, which they occasionally exert; and sometimes even deter their enemies by their voice or their scent, of which we have many curious examples in the history of particular animals.

The Teeth in Quadrupeds or Mammalia are of three kinds. I. Front or Cutting-Teeth, of a broad, compressed structure, designed for cutting their

food; 2. Sharp, lengthened, or canine teeth, situated on each side the cutting-teeth, and calculated for tearing and dividing the food; and lastly, Grinders, with broad, angular tops, for comminuting or grinding the food. They are situated, as in the human subject, on each side the jaws. The teeth afford a principal character in forming the tribes and genera, or particular sets of Quadrupeds; their distribution differing greatly in the different kinds. In some the canine teeth are wanting; in others the front teeth; and some few are totally destitute of any teeth.

The tail in Quadrupeds is formed by a continuation of the vertebræ or joints of the back-bone; and is in some of great length, and covered with very long hair: in others very short; and in some few entirely wanting, as in the real or genuine Apes.

The *Senses* of the Mammalia consist, as in Man, of the organs of sight, hearing, tasting, and smelling, and the power of feeling; and in many of these animals the organs are of greater acuteness or sensibility than in Man. The Eyes, in some Quadrupeds, are furnished with what is called a nictitating membrane, or semitransparent guard,

situated beneath the eyelids, and which can at pleasure be drawn over the ball of the eye for its farther defence. The nose or organ of smelling is more or less compressed and lengthened. In the Elephant it is extended in a most wonderful manner into a long and tubular proboscis or trunk, at the tip of which are placed the nostrils. The tongue in Quadrupeds is usually of a flattened and lengthened shape; sometimes, as in the Cat or Lion-tribe, beset on its upper surface, with small, reversed spines. In some few, as in the Ant-Eaters, it is of a cylindric shape, and lengthened into the form of a worm, and is extensile at the pleasure of the animal.

The Teats or Mammæ are found in all these animals, and, as before observed, give rise to the Linnæan title of the whole class.

After this general description of the Mammalia, we may proceed to take a slight view of the principal tribes or orders, and their most remarkable genera and species.

Modern Naturalists have disagreed with respect to the particular methods or distributions into which they have arranged Quadrupeds. The celebrated Count de Buffon entirely neglected all me-

thod or system, giving his elegant, but too diffuse descriptions without any regular order of distribution; and having begun his natural history of Quadrupeds in this manner, he chose to continue it through the whole of his voluminous work, except in a few instances, in which he seems to have found the necessity of being systematic even in spite of himself. Not contented with this general neglect of all arrangement in his history of Quadrupeds, Buffon seems to have taken a pleasure in endeavouring to depreciate the merit of systematic arrangement in general, and more particularly that of Linnæus. Linnæus, however, appears to have been fully conscious of his own superiority, and to have understood the policy as well as the dignity of literature too well, to exalt into celebrity the petulant remarks of Buffon by condescending to answer them. He even carefully abstained from mentioning that author; not a single quotation from the work of Buffon making its appearance in the whole course of the twelfth edition of the *Système Naturæ* of Linnæus. A defect which is very properly remedied in the enlarged edition of that work by Dr. Gmelin.

The whole class of *Mammalia* is divided by

Linnæus into seven orders. The first of these orders is entitled *Primates*, as containing the chiefs of the Creation. Its characters are, *four front or cutting teeth* above and below; and *one canine* or sharpened tooth on each side these. The *feet* are formed with a resemblance of *hands*, and the *nails* are more or less ovate in shape. Most of the order feed chiefly on vegetable substances. In a merely zoological view, the Human kind stands at the head of this order, forming the Linnæan genus *Homo*. Of the human species it can only be necessary here to observe, that it is strongly allied in the general structure of the body to a race of animals by no means calculated for flattering us by the resemblance.

The leading characters of the genus *Simia*, comprehending the whole race of Apes, Baboons, and Monkeys, are, that the teeth have the same disposition and general form as the Human teeth; i. e. that there are four flattish front teeth both above and below, a sharpened or canine tooth at some distance on each side these, and several grinders beyond: the feet also have a general resemblance to hands, and in most species are furnished with nails rather than claws.

common figures of these animals is, that the artists represent the mouth as if furnished with human lips.

The Black *Oran Otan*, which, as before observed, is a native of Africa, has been long ago very elegantly figured in the celebrated work of Dr. Tyson. It is somewhat less strikingly allied to the human figure than the former animal, the face being rather more prominent. Like the former, it has hitherto been brought to Europe in a young or unadvanced state, and its height has hardly ever exceeded that of two feet; but it appears probable that both species at their full length may arrive at a size not far inferior to the human stature, and indeed the black species, if we may rely on the accounts of some travellers, has been known to surpass that height.

The manners of both these animals, in a state of captivity, are gentle, and void of that disgusting ferocity so remarkable in many of the large animals of the Genus *Simia*. Their imitations of human actions, and the feats of dexterity for which they have been celebrated, have been so often repeated in various works of natural history, that they must be familiarly known to all persons of



BLACK ORAN-OTAN. *from Tyson.*

reading; and it must be quite unnecessary to recite them to an audience like the present. Those who may wish to examine their history more minutely, must be referred to the works of Buffon, Camper, Vosmaer, Daubenton, and Cuvier.

Convinced by the luminous observations of these latter enquirers, relative to the anatomy of these singular animals, we shall find that there are essential differences, even between their bodily structure and that of the human race; and shall readily dismiss all apprehensions of being too nearly allied to animals, which have, by uninformed philosophers, been held up as the rivals of Mankind.

From the observations of Camper and Cuvier, it is evident that these animals are in reality calculated for running and climbing in the manner of most other quadrupeds, and not for walking upright, as they are generally represented. It is however true, that they can more readily assume that position than most other quadrupeds, and may no doubt have been sometimes seen in such a posture in their native woods. Like the rest of the genuine Apes, the Oran Otans are perfectly destitute of a tail.

The manner of both the species of Oran Otan, viz. the black and the chesnut-coloured, are represented as extremely gentle when in a state of captivity. Dr. Tyson, who about the close of the 17th century gave a description of a young Oran Otan of the black species, assures us that it was (to use his own expressions) "the most gentle and loving creature that could be. Those on ship-board that he knew, he would embrace with the greatest tenderness, and, as I was informed, although there were other Monkeys on board, yet it was observed that he would never associate, and, as if nothing akin to them, would always avoid their company."

Mr. Vosmaer's account of the manners of a chesnut-coloured Oran Otan, brought into Holland in the year 1776, and presented to the Prince of Orange's Menagerie, is so curious, that I shall repeat it from his accurate publication on that subject.

This animal, says Mr. Vosmaer, was in height about two Rhenish feet and a half. It shewed no symptoms of fierceness or malignity, and was even of a melancholy appearance. It was fond of being in company, and shewed a preference to

those who took daily care of it, of which it seemed to be very sensible. Often, when they retired, it would throw itself on the ground as if in despair, uttering lamentable cries. Its keeper having been accustomed sometimes to sit near it on the ground, it would take the hay of its bed, and spread it in the form of a cushion or a seat, and by every demonstration invite its keeper to sit with it. Its usual manner of walking was on all fours, but it could also walk on its two hind feet. One morning it got unchained, and we beheld it, with wonderful agility, ascend the beams and rafters of the building: it was not without some trouble that it was taken, and we then remarked the prodigious strength of the animal; the assistance of four men being necessary, in order to hold it in such a manner as to be properly secured. During its state of liberty, it had, among other things, taken the cork from a bottle of Malaga wine, which it drank to the last drop, and had set the bottle in its place again. When presented with strawberries on a plate, of which it was extremely fond, it was very amusing to see it take them up one by one with a fork, and put them into its mouth. Its common drink was water, but it also willingly drank all

sorts of wine, but preferred Malaga. After eating, it always wiped its mouth, and when presented with a toothpick, always used it in a proper manner. This animal lived seven months in Holland, and was brought from the island of Borneo.

Two other very remarkable species of Ape are those called the long-armed Apes, or Gibbons. One of these is of a black colour, with the arms of such a length, that the tips of the fingers touch the ground when the animal stands upright. It is a native of India, and grows to the height of about three feet. It is remarkable for having been once placed by Linnæus, in one of the earlier editions of the *Systema Naturæ*, under the genus *Homo*, having been considered at that time as being still more nearly related to the Human race than even the *Oran Otan*. It was the *Simia Lar* of Linnæus, and is finely represented in Miller's *Miscellaneous plates of Natural history**. The other species of Gibbon, or long-armed Ape, differs from the pre-

* But besides this animal, Linnæus, in some editions of the *Systema Naturæ*, once introduced a species, under the name of *Homo Nocturnus*, which was evidently no other than the *Oran Otan*, indistinctly described, with various circumstances of aggravation, from certain voyages and travels.



BLACK LONG ARMED GIBBON



WHITE LONG-ARMED GIBBON

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DOG-FACED BABOON.

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Roach sculp.

ceding in being entirely white, except the face and hands: it is the *Simia Moloch* of Audebert. Of this animal, an admirable specimen exists in the Leverian Museum, and is well represented in the second number of the work entitled *Museum Leverianum*. It is impossible to contemplate the animal, without being struck with the very peculiar appearance which its general resemblance to the human figure gives it.

The common Barbary Ape, and the smaller variety or Pygmy Ape, are too well known to require particularizing: the latter is supposed by Mr. Pennant to have been the Pygmy of the ancients; so famous for their supposed battles with the Cranes.

The next division of the genus *Simia* comprehends what are called the Baboons. They are in general of large size, with lengthened dog-like faces, very muscular bodies, and tails of different lengths in the different species. One of the most remarkable is the *Simia Hamadryas* of Linnæus, or Grey Baboon. It is of an elegant grey colour, with the hair thickly mottled or freckled with minute dusky specks. As a species, it is particularly distinguished by the excessive length and fulness

of the hair on each side the head, which flows over the shoulders in such a manner as to form a kind of mantle. It is a native of many parts of Africa, and, like most other Baboons, is of a ferocious disposition. In a state of nature it feeds entirely on fruits and grain; and is said to commit great havoc in plantations of various kinds. This Baboon was one of the sacred animals of the ancient Egyptians, and frequently appears among the hieroglyphics inscribed on the ancient sarcophagi and obelisks of that country. It is also one of those species which are furnished with a tail of moderate length.

Among the Baboons with very short tails, the most remarkable is the *S. Mormon*, or variegated Baboon; finely represented in the first number of the *Museum Leverianum*. It is of an olive-brown colour, with a cast of yellow, and thickly besprinkled with small black specks. The whole length of the nose, in the full-grown animal, is of a vivid red, and the cheeks of a bright blue, marked on each side by several deep furrows: round the lower part of the body, the skin is of a beautiful changeable violet-colour, shaded with red. Like the former, it is a native of various parts of Africa.



VARIEGATED BABOON.



COATTA or SPIDER MONKEY

There is a smaller species, resembling this in every respect except size, and in having the face less brilliantly coloured. It is the *S. Maimon* of Linnæus, and is often considered as a variety of the former, but it rather seems to be truly distinct. Among the Monkeys properly so called, or those with very long tails, the common *green monkey*, or *S. Sabæa* of Linnæus, furnishes a good example. Its colour is a dark greenish grey, with the under parts of the body and insides of the limbs white: the tail long and blackish.

I must not omit to mention, that some Monkeys, particularly those of America, are furnished with what Linnæus calls a prehensile tail; that part being so constituted, as to possess the power of strongly coiling round any object at pleasure, and thus answering in some degree the purpose of a fifth hand: the under part of the tail, in such monkeys, is generally bare, and lined with a very strong elastic skin.

To those who wish to become acquainted with the several species of this extremely extensive genus, I must recommend the coloured plates of *Schreber*, who, in his work on the Mammalia, has collected almost all which have been hitherto de-

scribed. Several good figures may also be found in the magnificent work of Audebert, though many bad ones may also be there found. It may be added, that from indistinct or transient views of some of the larger kind of Apes and Baboons, must have originated the ancient idea of Satyrs, as the smaller kind of Apes gave rise to that of Pygmies.

The next natural genus, or assortment of the Order Primates, is that of *Lemur* or Macaoco. It consists of a set of animals, allied to the monkeys in some degree, but of a much more elegant appearance.

The particular character of the genus *Lemur* consists in the disposition of the teeth, which resemble those of Monkeys, but the lower front teeth are stretched out or forwards; and the canine teeth are placed close to them. As a secondary character, it may be observed, that the feet are formed like hands, and that the index or second finger of the hind feet is often furnished with a sharp lengthened claw. The genus *Lemur*, like that of *Simia*, feeds chiefly on vegetables; though some species are also observed to be carnivorous.



SLOW LEMUR

Knapp's sculp.

Of this genus, some are totally destitute of a tail, while others have that part of great length. Of the tailless kind, is the Lemur *Tardigradus*, or Slow Lemur, a native of the East Indian islands, and particularly of Ceylon. This animal is excessively slow in all its motions, more particularly during the day; and it is from this circumstance that it has been sometimes called the Ceylon Sloth, though not at all allied in any other respect to the Sloths properly so called, or the *Bradypus* tribe. Another and somewhat smaller species of Lemur, which has been often confounded with the former, is the slender-limbed Lemur: it is destitute of a tail, and is distinguished by the remarkable slenderness of its limbs. It is said to be naturally rather a quick and lively animal than slow in its motions.

Among the long-tailed species of Lemur, the most elegant is the Lemur *Catta* of Linnæus, or ring-tailed Macauco, an animal of great beauty, and a perfect contrast to the Slow Lemur in its manners; being a species of great agility, and leaping with peculiar lightness and ease. It is often brought over to Europe, and is easily rendered domestic. The *L. Mongoz*, or brown Ma-

cauco, differs in being of a brown colour without variegation; in some, rufous on the breast, and white beneath.

The two genera of *Simia* and *Lemur* may be said to constitute the real or proper *Primates*: Linnæus, however, as is well known, places in this order the genus *Vespertilio* or *Bat*; an association which at first appears incongruous, but which is justified by a consideration of many particulars in the structure of those animals; though not apparent at first view; nor will the transition from the genus *Lemur* to *Vespertilio* appear too abrupt, if we consider, that in the Linnæan genus *LEMUR* once stood a very curious animal, allied in many points to the rest of that tribe, but so different in others, that it is now, by the common consent of Zoologists, removed from it, and allowed to constitute a distinct genus. It is the *Colugo*, formerly called the *Flying Lemur*; the *Galeopithecus* of Pallas, a large animal, measuring about three feet in length, or from head to the extremity of the tail, and is furnished with expanded lateral membranes, when fully extended, measuring nearly as much: these membranes are not naked, as in the bats, but covered with a furry skin, like the rest of the



COLUGO or FLYING LEMUR

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body, and reaching to the feet themselves, and are continued from the hind-feet to the tip of the tail, which is included in the same skin*. This curious quadruped, which has often been indistinctly described by Indian travellers, under the title of the *Flying Cat*, is a native of the East Indian islands, where it lives in the manner of the genus *Lemur*, but flutters about during the night in the manner of a bat. Its general colour is grey, with a slight cast of reddish brown. Specimens are figured in the work of Audebert, from the museum of the Prince of Orange. That figured in the work of Mr. Pennant is from the Leverian museum. This animal therefore may, at present, lead us, by a kind of natural transition, to the genus *Vespertilio* or *Bat*.

Linnaeus has been sometimes severely censured for placing the Bats in the same tribe with the *Primates*, to which, on a cursory view, they seem so little allied. As it is certain, however, that we cannot form a fairly connected chain of the animal world, these seemingly abrupt transitions are but

* Its particular characters are: no front-teeth in the upper-jaw; but in the lower six broad, short, and distinct or separate teeth, deeply notched or pectinated on the tips.

of small consequence in an arrangement of Quadrupeds. I may add, in the words of an ingenious French writer, "so easy is it for a person conversant in subjects of this nature to ring changes, as it were, on the animal world, that a new system of Quadrupeds might be composed in less than half an hour."

Without enquiring, therefore, whether the Linnæan arrangement be in all points the best and most natural, it may perhaps, with some variations, be considered as the most convenient.

The genus *Vespertilio*, or Bat, is characterized by having, in general, small, upright, numerous, sharp-pointed teeth; and the fingers or divisions of the fore-feet are stretched out to a great length, and connected by a thin, naked membrane, giving the animal the power of flight. With respect to the teeth, however, in this genus, I must observe that they differ so much in the different kinds or species, that several distinct genera might be formed, instead of one, if an exact regard were paid to the particular disposition of the teeth in the various tribes. Some of the French naturalists have pursued this plan, and have instituted several genera from the single Linnæan genus *Vespertilio*.



VAMPIRE BAT. *in two attitudes*



Engelgate sculp

The curious structure of the wings in the Bat tribe cannot be contemplated without admiration; being so formed as to be capable, from their thinness, of being contracted at pleasure into innumerable wrinkles, so as to lie in a very small space when the animal is at rest, and to be stretched into a wide expanse for occasional flight.

The common Bats of our own country, however really curious, sink into insignificant objects compared to the enormous species found in some parts of India, Africa, and South America. Of these the chief is a species, long celebrated under the name of the Vampyre Bat: it is the *Vespertilio Vampyrus* of Linnæus, and its extraordinary history, if true, may well be said to deserve particular attention. The body of this animal is twice the size of a squirrel, or even larger, and the extent of the wings often measures at least five feet*: the colour of the body is a dusky brown, the head, neck, and shoulders of a reddish-brown: the wings black, as in the common bat. This species preys chiefly on insects and fruits; but it

* Sir Hans Sloane, as appears by his catalogue, preserved in the British Museum, was in possession of a specimen measuring seven feet. This is the largest I ever remember to have heard of, and was brought from Sumatra.

is pretended that it has the power of inserting the tip of its tongue so dexterously into the vein of a sleeping person, as to draw away a considerable quantity of blood, without waking the patient; all the while fanning with its wings, and agitating the air, in those hot climates, in so pleasing a manner, as to fling the sufferer into a still sounder sleep. It is therefore said to be unsafe for any person either to sleep in the open air, in regions frequented by these animals, or to sleep in a chamber with an open window. The cattle in many parts of South America are said to be often destroyed by these bats. The tongue of the Vampyre bat, when accurately examined, is found to be covered with very numerous, small, sharp prickles; but, except these, as the Count de Buffon observes, there seems to be nothing very particular in its structure, which can enable the animal to exert this singular power of bleeding without causing pain. It is, however, on account of this quality that Linnæus has denominated the species *Vespertilio Vampyrus*; but as he has given no explanation of the name, it is probable that the reason may not be generally known. A Vampyre is an imaginary monster, or spirit, supposed to suck the blood of sleeping persons. It

also alludes to one of the most absurd and degrading superstitions that ever entered the human mind. About the year 1732, an idea prevailed in some parts of Poland and Hungary, that certain human bodies, after interment, became possessed of a power of extracting or absorbing blood from those who were so unfortunate as to pass over, or stand near their graves: such bodies were said to be possessed by Vampyres, and in order to put a stop to their pernicious power, it was supposed necessary to disinter them, and wound them with a sword. Astonishing as this folly may appear, it is yet more astonishing to find that a great many learned treatises were written on the subject, and that while some endeavoured to combat the absurdity upon all the principles of sound philosophy, others defended it, from what they called undoubted facts. In the *Bibliotheca Anatomica* of the learned Haller may be found a list of most of the publications on this subject, and whoever reads that entertaining work of the late Lord Orford, entitled *Reminiscences**, will be fully con-

* In this work we are informed by his lordship, that a very exalted personage, in the time of his father, was perfectly con-

vinced that this superstition was by no means confined to the vulgar. We see, therefore, the propriety of the Linnæan name *Vampyre* or *Blood-Sucker* applied to this kind of Bat.

It is also to be observed, that the propensity to sucking the blood of animals is not in reality confined to the *Vampyre* bats, but is practised by many other species; and even the common bats of Europe are said to possess a similar faculty. Some of the large animals of this genus are well represented in the superb work of Seba, entitled *Thesaurus rerum Naturalium*, and are repeated, on a smaller scale, in Schreber's work on the *Mammalia*.

Bats are animals that lie torpid during the winter months; sometimes concealing themselves singly in any convenient cavity, and sometimes hanging together in clusters under rocks, in caverns, and sheltered places. When thus taken, in a torpid state, the circulation of the blood is not to be perceived by the microscope in the vessels of the membrane of the wings; but on the

vinced of the existence of these beings, and expressed high displeasure against Sir Robert Walpole for speaking irreverently of *Vampyres*.

application of a certain degree of heat, the animal gradually recovers from its torpor, and the circulation of the blood becomes visible.

The general appearance of the Bat, together with its nocturnal flight, must be confessed to excite the idea of something hideous and dismal; and for this reason the ancients consecrated it to Proserpine, and supposed it to be one of the inhabitants of her dusky regions: and it cannot fail to occur to the recollection of every one, that painters, in their representations of fiends and demons, usually exhibit them with the leathern wings of the Bat. It is also equally evident, that the fabulous Harpies of the ancients must have originated from a similar source; the larger Bats of India and Africa, by a little poetical exaggeration of their manners, answering extremely well to the general description of those monsters.

I know not whether it may be worth while to mention the celebrated experiments of Spallanzani, respecting a supposed additional sense or faculty in Bats, enabling them, when deprived of sight, to avoid any obstacles as readily as when they retained their power of vision. These experiments are cruel, and perhaps do not lead to

any very important discoveries in the animal œconomy: nevertheless, that I may not seem entirely to neglect a phenomenon which has been thought worthy of attention by several eminent experimentalists, I shall here give a short abstract of Spallanzani's observations.

Having observed that Bats would fly in the most dusky chambers with precision, and not even touch the walls, he found them equally exact in their motions when the eyes were closely covered: and at length he destroyed the eyes, and covered the socket with leather; and even in this state the animal continued to fly with the same precision as before; avoiding the walls, and cautiously suspending its flight in seeking where to perch. It even flies out at a door without touching the architraves. The Abbé repeated his experiments on several species of Bats; and with the same success. These experiments were repeated by Vassalli at Turin, by Rossi at Pisa, Spadon at Bologna, and Jurin at Geneva. Spallanzani's arguments for supposing that in these instances no other sense can supply the place of sight, are the following.

“*Touch* cannot, in this case, supply the place of sight, because an animal covered with hair

cannot be supposed to have that sense very delicate. In flying through the middle of a narrow passage which turned at right angles, the Bats regularly bent their flight at the curvature, though two feet distant from the walls. They discovered holes for their retreat; found a resting-place on the cornice; avoided the branches of trees suspended in a room; flew through threads hung perpendicularly from the ceiling, without touching them, though they were scarcely at a greater distance from each other than that of their extended wings; and when the threads were brought nearer, they contracted their wings to pass through them. They equally avoided every obstacle, though the whole head was covered with a varnish made of Sandarach dissolved in spirit of wine.

“The *ear* could not have discovered a cornice, or the threads; *this* sense therefore does not compensate the want of vision. Besides, Bats fly equally well when the ear is most carefully covered. The *smell* might possibly assist them; for when the nose was stopped, they breathed with difficulty, and soon fell. While they did fly, however, they avoided obstacles very well; and the smell could scarcely have assisted them in dis-

covering the suspended threads. The *taste* must have been, in every respect, unequal to the task of supplying the place of sight."

Such were the experiments, and such the conclusions of Spallanzani.

From Mr. Jurin's anatomical observations on these animals, it appears, that a very large proportion of nerves is expanded on the upper jaw, the muzzle, and the organ of hearing; and these appeared to him, in a great degree, to account for the extraordinary faculty above described.

I shall conclude the history of these animals by observing, that they are commonly supposed to produce two young at a birth, which they suckle for a very considerable time. When recently born, they adhere most tenaciously to the breast of the parent, so as not to be removed without difficulty. The parent also occasionally flies, with her two young ones thus attached to her, even when they are considerably advanced in their growth.

We have now surveyed the Linnæan Order *Primates*, and shall pass on to that entitled *Bruta*, a title not easy rendered into our own language, since the word Brute is applicable to the rest of

the Mammalia, as well as to these. We must therefore be content to use the *Linnæan* word unchanged.

The Order *Bruta* is characterized by a want of front or cutting teeth, both in the upper and lower jaw. The feet are armed with strong claws: their pace is, in general, somewhat slow, and their food is principally vegetable.

In the rapid and general survey which the term allotted for our lectures permits us to take of the animal world, we can only mention the chief or leading particulars in each order. The genera which should properly compose the Linnæan order *Bruta* are those of *Bradypus* or Sloth; *Dasypus* or Armadillo; *Manis* or Pangolin; and *Myrmecophaga* or Ant-Eater; and lastly, the new or lately discovered genus *Platypus*, Ornithorynchus, or Duck-bill. All the animals belonging to these genera are totally destitute of front-teeth, and some are destitute of all teeth*.

* Linnæus himself preferred the Elephant to the order *Bruta*, but it seems to be the general opinion of later Zoologists that it should more properly be referred to a different order. The same may be said of some other quadrupeds sometimes stationed by authors among the *Bruta* of the Linnæan arrangement.

The genus *Bradypus* or Sloth is highly remarkable. It consists of but very few species, of which the most curious is the three-toed Sloth, or *Bradypus tridactylus* of Linnæus. This quadruped is a native of the hotter parts of South America, where it resides on trees, feeding on the foliage and fruit. It is of all quadrupeds the slowest in its motions, appearing even to move with difficulty, and never exerting its progressive powers, except when urged by a want of food. Before the discovery of the western hemisphere, the common Tortoise seems to have been considered as the established type of tardiness; but the three-toed Sloth is a much more striking example of languid motion and habitual inactivity. The early accounts, however, of this extraordinary animal seem to have been given with a considerable degree of exaggeration; it having been at first pretended, that the creature could scarcely advance to the distance of a stone's throw in less than fifteen days: that it required eight or nine minutes, in order to move one foot to the distance of three inches. The general appearance of the Sloth is extremely uncouth: its size is that of a smallish

THREE TOED SLOTH



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dog: the body is of a thick shape, the fore-legs very long; the hinder far shorter: the feet are very small, but they are each armed with three most excessively strong and large claws, of a slightly curved form, and sharp-pointed: the head is small: the face short, with a rounded or blunt snout: the eyes small, black, and round: the ears flat, rounded, lying close to the head, and not ill resembling those of Monkeys. The general colour of the animal is a greyish brown, and the hair is extremely coarse, moderately long, and very thickly covers the whole body and limbs. A remarkable character as to colour in this animal is a broad patch on the upper part of the back of a reddish or yellowish brown, marked on each side by several black spots, and down the middle by a very conspicuous long black stripe. In the young animals this stripe is but very obscurely, if at all, visible. The leading or specific character of the animal consists in all the feet being furnished with three claws; which affords an easy and ready mark of distinction between this species and the *two-toed Sloth* or *Bradypus didactylus*, which is of similar size, and considerably allied to it in form, but has

invariably two claws only on the fore-feet, and three on the hind*.

The Count de Buffon, in one of those flights of paradoxical eloquence in which he sometimes indulges, is not willing to allow the common or three-toed Sloth any share in contributing to the general beauty in the scale of animated nature, but considers it as an ill-constructed mass of deformity, calculated only for misery, which he thinks is the less to be wondered at, since perhaps the major part of Mankind experience a similar fate.

“ From a defect in their conformation, says this author, the misery of these animals is not less conspicuous than their slowness: they have no cutting-teeth: the eyes are obscured with hair; the chaps are heavy and thick; the hair is flat, and resembles withered herbs; the thighs are ill jointed to the hanches; the legs are too short, ill turned, and terminated still worse: their feet have no soles, and no toes which move separately, but only two

* The three-toed Sloth exhibits a peculiarity in the structure of its skeleton, unexampled by that of any other quadruped: viz. that the neck has *nine* vertebræ or bones; the number in all other quadrupeds, and even in the two-toed Sloth, being only seven.

or three claws disproportionately long, and bent downwards, which move together, and are more hurtful to their walking than advantageous in assisting them to climb. Slowness, habitual pain, and stupidity are the results of this strange and bungled conformation. The Sloths have no weapons either offensive or defensive. They are furnished with no means of safety; for they can neither run, nor dig into the earth. Confined to a small space, or to the tree under which they are brought forth, they are prisoners in the midst of space, and cannot move the length of one fathom in an hour. They drag themselves up a tree with much labour and pain; their cry, and interrupted accents, they dare only utter in the night: all these circumstances announce the misery of the Sloths, and recal to our minds those defective monsters, those imperfect sketches of Nature, which, being hardly endowed with faculties of existence, could not subsist for any length of time, and have accordingly been struck out of the list of beings. If the regions inhabited by the Sloths were not desert, but had been occupied for any length of time by Man and the larger animals, these creatures would never have descended to our times; but would have been anni-

hilated, as in some future period will be the case. Every thing that Nature could possibly produce, capable of existence, has been produced, of which the Sloths are a striking example. They constitute the last term of existence in the order of animals endowed with flesh and blood: one other defect added to the number would have totally prevented their existence. To regard these bungled sketches as beings equally perfect with others; to call in the aid of final causes to account for such disproportioned productions, and to make Nature as brilliant in these as in her most beautiful animals, is to view her through a narrow tube, and to substitute our own fancies for her intentions. Why should not some animals be created for misery, since in the human species the greatest number of individuals are devoted to pain from the moment of their existence? Evil, it is true, proceeds more from ourselves than from Nature. For a single person who is unhappy because born feeble or deformed, there are millions who are rendered miserable by the oppression of their superiors. The inferior animals, in general, are more happy, because the species have nothing to fear from individuals: to them there is but one source of evil: to Man there

are two; Moral Evil, of which he is himself the fountain, has accumulated into an immense ocean, which covers and afflicts the whole surface of the earth. Physical evil, on the contrary, is restrained within very narrow bounds: it seldom appears alone; for it is always accompanied with an equal, if not a superior good. Can happiness be denied to animals, when they enjoy freedom; have the faculty of procuring subsistence with ease, and possess more health and organs capable of affording more pleasure than those of the human species? Now the generality of animals are most liberally endowed with all these sources of enjoyment. The degraded Sloths are perhaps the only animals to whom Nature has been unkind, and which exhibit to us the picture of innate misery."

In opposition however to this eloquent harangue, we may venture to suppose, without any fear of being in the wrong, that the Sloth, notwithstanding this appearance of wretchedness and deformity, is as well fashioned for its proper modes and habits of life, and feels as much pleasure in its solitary and obscure retreats, as the rest of the animal world, of greater locomotive powers, and superior external elegance.

I should add, that although the Sloths are natives of South America, yet it is contended by Seba and some others that the two-toed species has been found in some parts of the East-Indies, and particularly in the island of Ceylon.

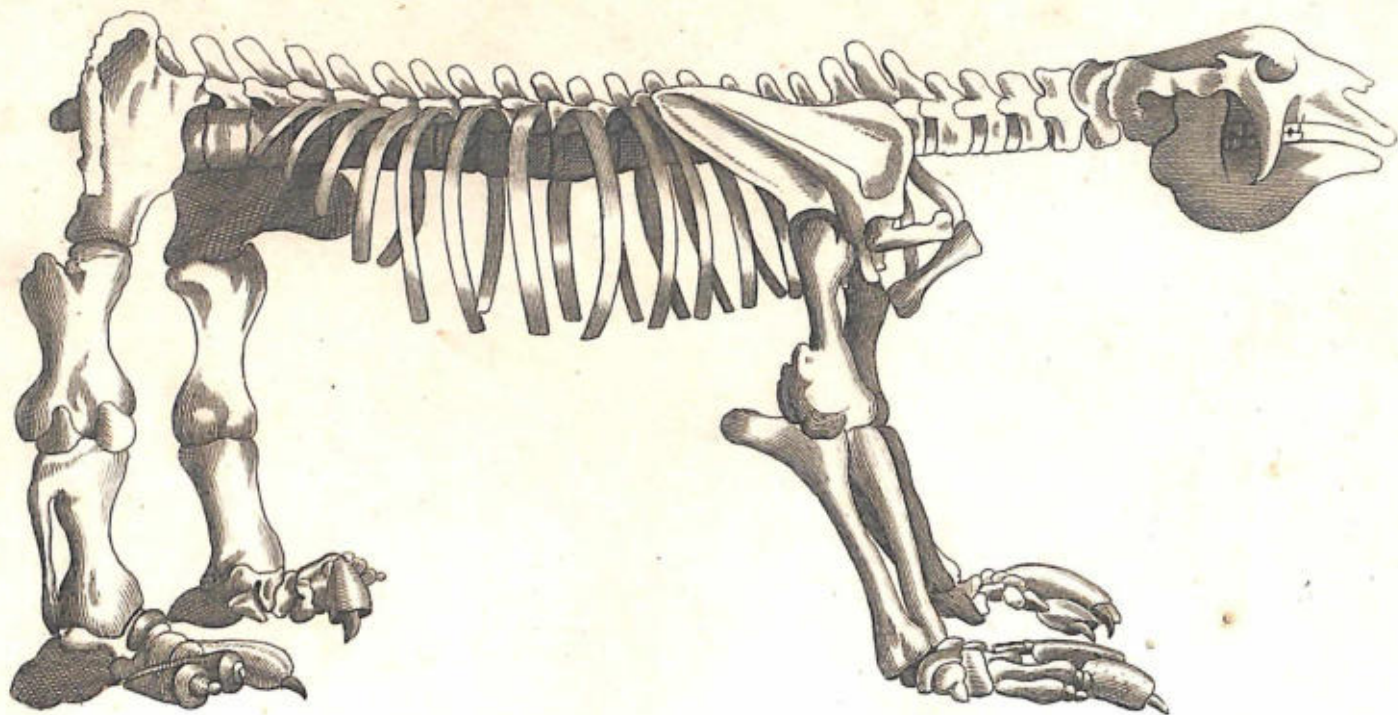
A few years ago a very remarkable animal was brought into this country from the interior parts of Bengal, which by Mr. Pennant and others was referred to the present genus, and considered as a species of Sloth. Its general appearance however was so much allied to that of a Bear, that it was natural enough, at first sight to suppose it to belong to the genus *Ursus*. It was in company with Mr. Pennant that I first examined it with accuracy, and could not but agree with him in opinion that it should be regarded as a species of Sloth, from the appearance of the teeth. But the age of the animal was not ascertained, and it was not clear that it had gained the legitimate number of its teeth. It was described by myself under the name of *Bradypus ursinus* or the Ursine Sloth, and has been extremely well' figured by an ingenious artist, whose representation has been repeated in different works. The animal was about the size of a Bear, and of a black colour, with very

long shaggy hair; a lengthened, naked, and flexible snout; five excessively strong, curved claws on the fore-feet, and five much smaller, and of a rounder shape, on the hind feet; the tail and ears very short. Its motions were not peculiarly languid, as in the Sloths, but moderately lively: its manners were gentle, and it fed on vegetable substances and milk. I forbear any longer description of the animal, and must refer those who wish for more particular information, to the description given in the Naturalist's Miscellany, and in last Edition of Mr. Pennant's Quadrupeds; but I have now to observe that in consequence of information received on this subject from an ingenious naturalist lately arrived from India, and who has had opportunities of examining the animal in its native regions, it ought really to be referred to the genus *Ursus* or Bear, and may therefore not improperly be named *Ursus Bengalensis* or the Bengal Bear*.

To the genus *Bradypus* or Sloth is allied, according to the ingenious Cuvier, the celebrated

* In the Leverian Museum, the impending dispersion of which must be considered as an unspeakable disadvantage to the study of Natural History in this Country, may be seen a very fine specimen of this remarkable animal.

fossil skeleton of a very large quadruped, dug up a few years ago in South America, and preserved in the Museum at Madrid. It has been described under the title of *Megatherium*, and differs, according to Cuvier, in its characters, taken together, from all known quadrupeds; and each of its bones, considered apart, also differs from the corresponding bones of all known animals; but it appears more nearly allied to the Sloths than to any other of the Mammalia. The skeleton measures near twelve feet in length, and six in height.



MEGATHERIUM AMERICANUM.

See Tab. I. Published by G. Knolly, Fleet Street.

LECTURE III.

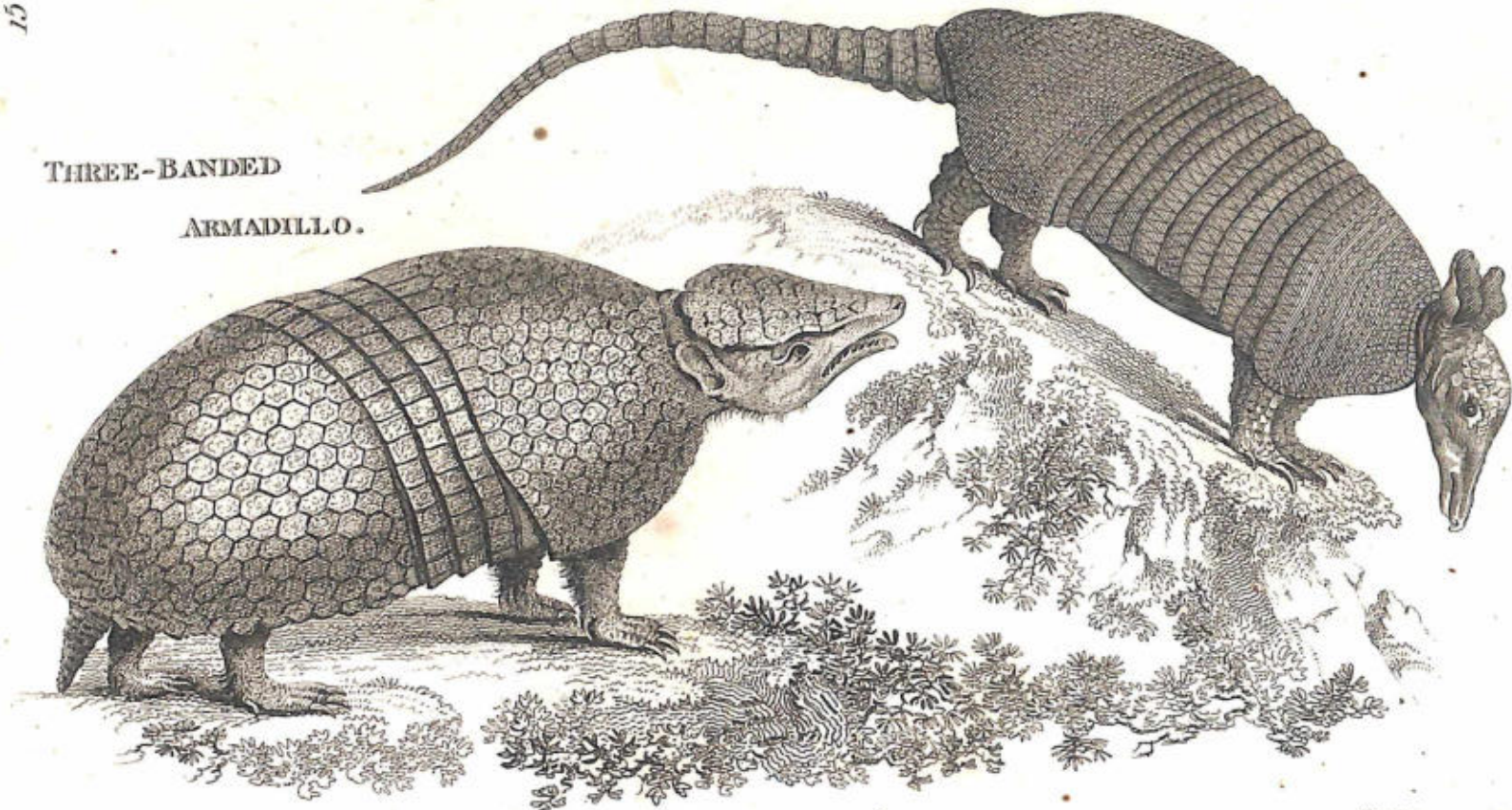
IN the preceding Lecture, I repeated the celebrated harangue of the Count de Buffon, relative to the supposed misery of the Quadrupeds called Sloths, and concluded with a slight account of a supposed Indian species, and of a remarkable fossil skeleton, seemingly allied to the same genus. I shall now proceed to the remaining animals of this order, all of which are distinguished by the total want of front teeth, and some are totally destitute of any teeth.

One of the most remarkable of these Genera of Quadrupeds is that of *Dasytus*, or Armadillo. This genus is readily distinguished from all others, since all the species belonging to it are by nature furnished with a most elegant suit of bony armour, so curiously disposed, that it is impossible to behold it without the highest admira-

tion. The long zones or divisions, covering the upper part of the body, differ in number in the different species, and thus afford a good general character of distinction. The most common species is the *Dasypus novem-cinctus*, or nine-banded Armadillo. All the Armadillos are natives of South America, where they reside in dry and rocky places, and have the faculty of burrowing under ground. They wander about chiefly by night, and devour various kinds of roots and grain: they also prey on worms and insects; and when in a state of captivity, will readily eat animal food, and that in considerable quantities. The side-teeth or grinders are numerous, but they have neither canine nor front-teeth. They are of a perfectly innocent and inoffensive nature. The largest species known is the twelve-banded Armadillo, which arrives at the length of four feet from the snout to the tip of the tail: all the rest are of a much smaller size, measuring not more than a foot in body, exclusive of the tail. The general colour of Armadillos in a living state seems to be brown, but some are of a very pale or yellowish brown cast; and all, in a natural state, have the shelly or bony armour covered with a

NINE-BANDED ARMADILLO.

THREE-BANDED
ARMADILLO.



1800 F. & J. London. Published by C. Kearby, Fleet Street

W. H. J. S.

MANIS TETRADACTYLA
or Long tailed Pangolin



J. Owen Sculp.

MANIS PENTADACTYLA
or short tailed Pangolin

thin, semitransparent epidermis or skin, beneath which the bony crust itself is white. When the Armadillos are attacked by other animals, they roll themselves up into the form of a ball, by contracting their body and limbs, and are thus secured from all common violence; affording one of the most beautiful and striking instances of the benevolent care which Nature has taken in the protection of animals of a weak and inoffensive nature.

The genus *Manis* or Pangolin, is distinguished by an appearance so far removed from that of the generality of viviparous quadrupeds, that, at first view, it rather suggests the idea of an animal of the Lizard tribe; and hence these quadrupeds have been often called by the improper title of *Scaly Lizards*. The mouth is lengthened into the form of a tubular snout, without any teeth, and the tongue is very long, round, and capable of being extended at pleasure, to a great length, and instead of hair, the animal is coated on all parts, except on the belly, by extremely strong and large scales, composing a suit of armour, capable of defending the creature, when rolled up, from the assaults of the most ferocious enemies. The Pan-

golins are of a harmless nature, and are chiefly found in various parts of India and the Indian islands: they feed on the smaller kinds of insects, and particularly on ants, which they obtain by stretching out their long worm-shaped tongue amidst heaps of those insects, and when covered with them, suddenly retracting it, and swallowing them.

There seem to be only two or three distinct species known, with some occasional varieties of each. The principal species is the *Manis pentadactyla* of Linnæus, or the five-toed Pangolin; distinguished by having five claws on the fore-feet, and four on the hind: the middle claws of the fore-feet being extremely large and strong. In India this animal is particularly called the Pangolin; it is said chiefly to frequent woods and marshy places, walking slowly, and when pursued, rolling itself up into the form of an oval ball; and thus becomes so strongly armed, that even the Tiger and the Leopard cannot attack it with impunity, but wound their own feet in the assault. The colour of the five-toed Pangolin is a pale, yellowish brown; besides the character of five claws on the fore-feet, the tail, in this species, is



GREAT ANT-EATER.

See Febl. London, Publish'd by C. Kearsley, Fleet Street.

shorter than the body. It grows to the length of four or five feet, or even more. The other species or four-toed Pangolin, the *M. tetradactyla* of Linnæus, is very closely allied to the preceding, but is of a rather longer or more slender shape, with only four claws on all the feet; and the tail is considerably longer than the body. Its manners are similar to those of the preceding kind, and its size scarcely inferior.

The next genus which we shall attend to, is that of *Myrmecophaga*, or Ant-Eater. It is distinguished, like that of Manis, by having the mouth lengthened into the form of a snout, and perfectly destitute of teeth, except that, very deep at the back part of the mouth, are said to be situated (according to the observations of Camper) a pair of small bony prominences, which may be supposed to act as a kind of grinders: the tongue, as in the former genus, is very long, round, and capable of being extended to a great distance from the tip of the snout. The body, except in one or two species lately discovered, is covered with hair. The species of Ant-Eaters are not numerous. The chief is the Great Ant-eater, or *M. Jubata* of Linnæus, a quadruped of very con-

siderable size and of very singular aspect, measuring from six to seven feet in length, from the tip of the snout to that of the tail; the body is of a lengthened form, with a small head, long snout, and very long hairy tail. The colour of the animal is a deep iron-grey, with a broad black band or stripe, edged with white, passing along each side of the breast and flanks; the tail is also black: on the fore-feet are four claws, and on the hind-feet five: the two middle claws of the fore-feet being extremely strong; a circumstance which renders this quadruped, though destitute of teeth, a very formidable adversary, since it has been known to destroy animals of much greater apparent strength, by continued laceration and pressure. It is a native of South America; chiefly of Brasil and Guiana; sleeping during the greatest part of the day, and coming out by night. It feeds entirely on ants and other insects, laying its tongue on the hillocks or nests of these insects, and from time to time retracting it, in order to swallow the ants with which it is covered. The finest specimen of this animal perhaps ever brought into Europe, is preserved in the Leverian Museum.

The smallest species of Ant-Eater is a highly

TWO TOED ANT EATER



PORCUPINE ANT EATER

elegant animal, scarcely larger than a squirrel, and measuring little more than seven inches from the nose to the tail, which is longer than the whole body and head, and is also strongly prehensile: the snout is slightly bent, rather sharpened, and of a tubular structure; the legs short, with the fore feet furnished with only two claws on each, but of excessive size in proportion to the limb. The hind-feet have each four claws, of moderate size. The colour of the animal is an elegant pale yellow-brown, and the hair is beautifully undulated or waved. This species, which is called the two-toed Ant-Eater, *Myrmecophaga didactyla* of Linnaeus, is a native of South America, where it resides on trees, and lives on insects, and particularly on a species of Ants, which form their nests on the trees it frequents. An excellent figure of this species of Ant-Eater has been given by Edwards, in his Gleanings of Natural History.

The last species of Ant-Eater which I shall mention, is a native of Australasia or New Holland, and differs from all the rest in being covered, not with hair, but with strong and sharp quills or spines, similar to those of a Porcupine, but shorter in proportion. This highly curious species usually

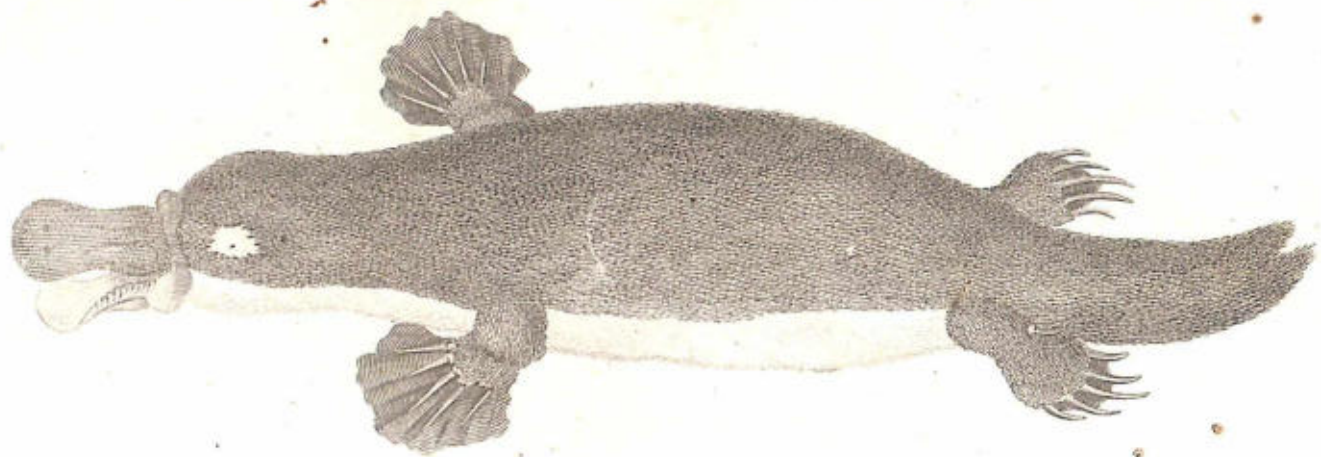
measures about a foot or fifteen inches in length, and is of a thick and strong form, with very short limbs, and a narrow tubular snout. It affords a striking instance of one of those collateral affinities which we had before occasion to advert to; by which animals of different tribes have a kind of connexion with each other; in the present instance, we see an affinity between the genus *Myrmecophaga* in the order Bruta, and the Porcupine, which belongs to a widely different tribe of animals, and ranks in an order called Glires. The Aculeated or Porcupine Ant-Eater, is of a black or very dark brown colour on the limbs and lower parts, while the spines or quills are of a yellowish white, with black tips. On the fore-feet are five very strong claws, and on the hind four; the tail is excessively short, and beset with large upright quills. In its mode of life this animal resembles the rest of the Ant-Eaters. It is generally found in the midst of some large ant-hill. It burrows with great strength and celerity under ground, when disturbed, and it is said that it will even burrow under a very strong pavement, removing the stones with its claws: during such exertions, its body is observed to be stretched or

lengthened to an uncommon degree, so as to appear very different from the short and plump aspect which it bears in its undisturbed state.

It cannot have escaped the attention of every one, that the genera of the Pangolins and Ant-Eaters differ only in their external covering from each other; the Linnæan genus *Myrmecophaga* being covered with hair, and that of *Manis* with strong horny scales. In consequence therefore of the discovery of the aculeated or porcupine Ant-Eater, it follows that the Linnæan character of the genus *Myrmecophaga*, is in part rendered inapplicable, since a genuine species of Ant-Eater is now discovered, which is coated, not with hair, but with strong spines or quills. We may therefore either enlarge the Linnæan character of the Ant-Eaters, by saying that the body is covered either with hair or spines, or else we may consider the aculeated Ant-Eater as constituting a new and distinct genus, of which the characters will be, a mouth of a tubular structure, and without teeth, but furnished with a long, extensile tongue, and the body covered with strong spines. I may add that two other species have been lately discovered,

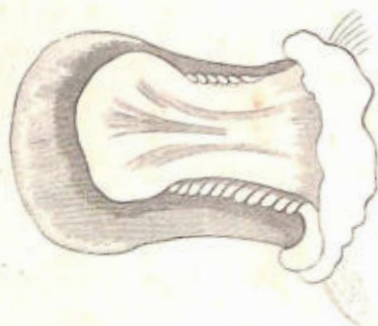
somewhat smaller than the present, with shorter spines, and of a whitish colour.

We now arrive at a genus of quadrupeds of so very extraordinary a nature, as to surpass in singularity every other that has hitherto been discovered. This genus, which at present consists but of a single species and its supposed varieties, is distinguished by the title of *Platypus* or *Ornithorhynchus*; the former name having been given it on account of the very expanded webs of its fore-feet, and the latter from the appearance of the snout, which has the resemblance of the bill of a bird. Its English generic name of *Duckbill* is that by which it is commonly known. If we rank this animal according to the Linnæan arrangement of quadrupeds, it must of necessity belong to the order *Bruta*, being destitute of teeth; but if we rank it according to its general habit or appearance, it might find a place among the Seals and other web-footed quadrupeds. The fact however is, that it may be questioned whether it really and properly belongs to the tribe of *Mammalia* or not; since no examination hitherto made, of such specimens as have been brought over, preserved



DUCK-BILLED PLATYPUS.

Engraved by G. Kneller, Fleet Street.



Beak & Feet of the PLATYPUS of their Natural size.

in spirits, have exhibited the least appearance of teats for suckling the young; nor is it easy to conceive how the animal could perform the action of sucking; since the mouth or snout bears the most exact resemblance to the bill of a Duck, and particularly to that of the broad-billed Ducks called Shovellers. This beak is surrounded at the base by a circular flap or border, resembling leather, and perfectly separating the base of the bill from the fur of the head. There are no teeth of any kind; and even the tubercles or processes, which may be perceived by dissection, on each side the base or back part of the beak, are not real teeth, having no sockets, and not being of a really bony nature. The tongue is situated very far back in the mouth, and is broad and short: the fore-feet are webbed, much more widely in proportion than in any other web-footed quadruped, and are furnished with five short, sharp, and strong claws: the hind-feet are less deeply webbed, and have also five claws, of a slightly curved form; besides which, in the male animal is situated on each foot a very strong and sharp crooked spur or sixth claw, not ill resembling the spur of a Cock: the body is of a broad, and slightly de-

pressed shape, with a rather small head, and eyes so small, and so deeply imbedded in the fur, as not to be distinctly visible without a close inspection: the tail is broad, rather short, and very slightly pointed. The whole animal is thickly covered with strong, but soft and glossy hair, which on the upper parts is of a deep iron-grey, more or less intense in different individuals, and on the under-parts considerably paler; in some specimens whitish. The general length of the animal, from the tip of the bill to that of the tail, is from twelve to sixteen or eighteen inches.

This most extraordinary and dubious quadruped is a native of Australasia or New Holland, where it inhabits fresh-water lakes, and is supposed to feed on worms, water-insects, and perhaps on various weeds, in the manner of a Duck. It is obliged to rise every now and then to the surface in order to breathe, and it is at this particular juncture that it is principally taken, by transfixing it with a small kind of harpoon. It is supposed to burrow, at a considerable depth into the banks of the waters it inhabits.

If there be no mistake in the anatomical disquisitions hitherto made on the Duckbill, its in-

ternal structure is not less extraordinary than its external; since it appears to be oviparous; presenting an appearance which gives reason for supposing that it bears internal eggs, in the manner of many of the lizard tribe, from which the young are hatched before their final exclusion.

This Quadruped therefore may be considered as the miracle of Modern Zoology.

In the Phil. Trans. for 1802, may be found an excellent description of the anatomy of this interesting animal, by the ingenious Mr. Home.

The order *Bruta* presenting several highly curious animals, we have dwelt somewhat longer upon it, than its proportional limits would otherwise have allowed us to do; and must hasten through the remaining orders with a more rapid step.

The third Linnæan Order of the Mammalia is entitled *Feræ*. It contains the predacious quadrupeds, and consists of several genera, all agreeing in having teeth evidently calculated for feeding on flesh. The front-teeth, which are usually six both above and below, approach to a conical or pointed figure; the canine-teeth are long; and

the grinders not flattened at the top, but are of a lobated and sharpened form; the claws also with which the feet are furnished are sharp, and more or less curved in the different species.

The first genus of the *Feræ* or predacious quadrupeds, (if we exclude that of *Phoca* or Seal, which will be more properly stationed in a different division), is that of *Canis* or Dog; this comprehends all the animals of the Dog tribe: it consequently consists of the common Dog, with all its numerous varieties; the *Hyæna*, of which there are two distinct kinds; the *Fox*, of which many varieties exist; the Wolf, so common and so destructive in many parts of the northern world; and the *Jackall*, peculiar to Eastern and Southern regions. The chief character of the Dog tribe, consists in having six front-teeth above and below; the middle ones in the upper jaw, and the side ones in the lower jaw lobated: the grinders are six or seven on each side: the toes, or divisions of the fore-feet are five in number, and of the hind-feet four. To these characters may be added that the visage is of a lengthened shape.

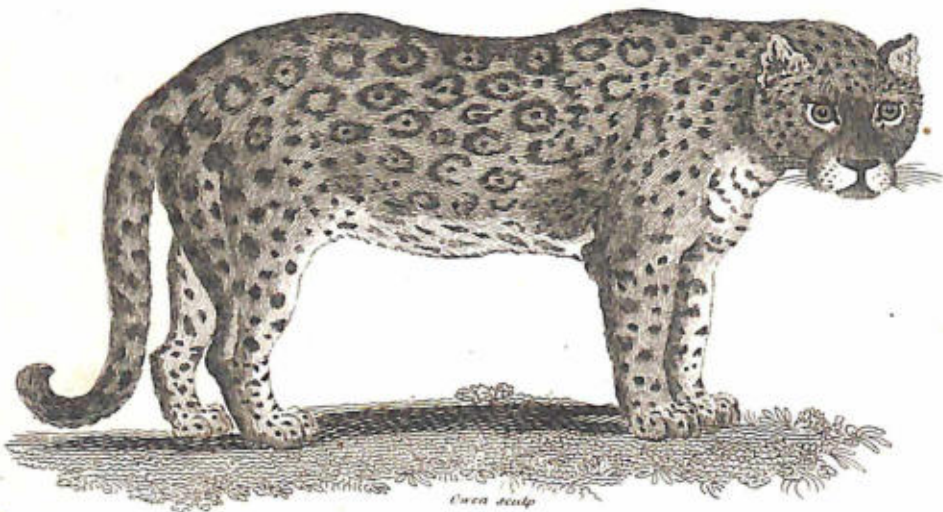
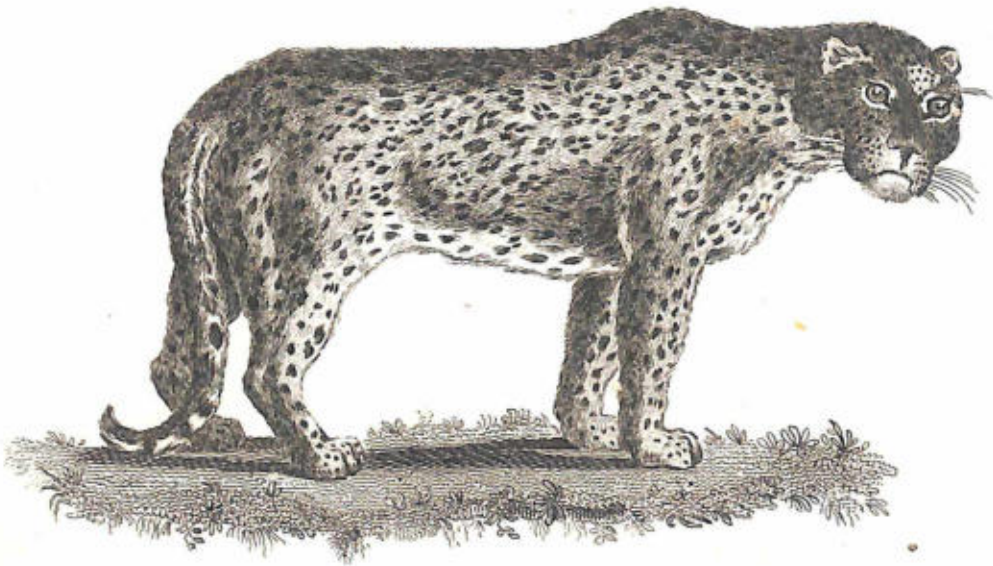
Next succeeds the genus *Felis* or Cat, compre-



STRIPED HYÆNA

1808 Oct. London Published by C. Kearsey, Fleet Street

LEOPARD



PANTHER

hending all the Cat or Lion tribe, from the Lion, which is the leading or principal species, to the common Cat. The species in this genus are pretty numerous: among the chief is the Tiger, perhaps, when seen in perfection, the most beautiful of quadrupeds, being of a strong and lively orange-colour, with numerous transverse black stripes. The Panther is a highly beautiful species, of a bright tawny yellow colour; marked with very numerous black spots, disposed in circles of four or five spots in each, with one or more central spots: the Leopard extremely resembles the Panther, but is smaller, and differs in having no central spot in the circles of black spots with which the skin is covered. These two animals, the Panther and the Leopard, have been very frequently confounded in the works of naturalists: the difference however will be readily perceived on inspecting their respective skins in the shops of the dealers in furs.

Of these animals the Tiger is chiefly found in Asia, and the Lion, Panther, and Leopard in Africa; but none of them are natives of America, other species of this genus being improperly so named. Of these the chief is the *Jaguar*, com-

monly called the Brazilian Tiger, about the size of a Wolf, and of a tawny colour, with the top of the back marked by long black stripes, and sides by rows of irregular lengthened spots. Many of the smaller American animals of this genus are very beautiful, and are collected and figured in the works of Schreber and others.

I shall dismiss this genus by observing that the general shape of most of the species resembles that of the common Cat, which, in a wild state, is a native of many parts of Europe, and among others of our own island; being occasionally found in woods: in its natural or wild state it is far larger than the domestic kind, and is of a grey colour, with darker stripes. The numerous varieties of the domestic Cat are well known: the variety called the *Angora Cat* is reckoned the most elegant, and is remarkable for the fulness of its hair: it is also often seen with one eye of a bright blue, and the other yellow. All the generic characters of the whole lion tribe may be readily exemplified by an examination of the common Cat, and it is therefore unnecessary to particularize them here; we may only observe as a particular mark, that the claws are retractile, that is, so constituted as



STRIATED VAR. of MEPHITIC WEASEL.



EGYPTIAN ICHNEUMON

1808 Oct. 2. London Published by G. Kearsley Fleet Street.

to be at pleasure withdrawn into a kind of sheaths when not in use.

The succeeding genus contains a great many species, comprehending all the animals of the Weasel kind. Linnæus indeed institutes two separate genera for these animals, on account of certain differences observable in the disposition of the teeth; but, in a general view, they may all be considered as furnishing one very large genus or assortment, under the title of *Viverra*. The general character of the Weasel tribe is a certain slenderness and length of body; with a sharpened visage, short legs, and, in most species, a longish tail; (for it is short in but a few.) The front teeth are six in number: with the middle ones shorter than the rest*.

To the Weasel tribe belongs the celebrated animal called the Ichnuemon, which was so highly esteemed by the ancient Egyptians on account of its great utility in destroying serpents and other noxious animals. It has a general resemblance to a very large ferret, but is of a brown-

* The animal known by the name of the Polecat, (*Mustela Putorius*, Lin.) may serve to give some idea of the general appearance of the animals of this genus.

ish-grey colour, with the hair freckled by innumerable minute dusky specks. The snout is long and sharp, and the tail thick and full at the base, and gradually tapering to the tip. Like many other animals of this tribe it is a dangerous enemy to many creatures larger than itself, over which it gains an easy victory by fastening upon them, and sucking their blood. It is a native both of Asia and Africa, and varies in size in the different regions.

Some of the Weasel tribe are remarkable for diffusing, when disturbed or hunted, a most intolerably fetid smell, so powerful as to taint the air to an incredible distance. If the accounts given of this odious vapor are not aggravated by those who have experienced its effects, every other ill smell which Nature is capable of producing is surpassed by the overpowering fetor of these extraordinary quadrupeds. In consequence of the dreadful emanation, even the dogs are said to relinquish their prey, and the men to fly with the utmost precipitation from the tainted spot. One of the most remarkable of these animals is the *Mephitic Weasel*, a North-American species, of the size of a small cat, and of a deep chocolate-brown colour, with a

broad white stripe down the back, and a very long bushy tail of a white colour.

Other animals of the Weasel tribe are equally remarkable for diffusing an odor of a highly pleasing kind; as the animal called the Civet-Cat for instance, which is a large viverra or Weasel, measuring more than three feet from the nose to the end of the tail: it is of a yellowish grey colour, marked along the sides by large blackish or dusky spots disposed into rows: the throat, breast, and legs are also black. The substance called Civet is obtained by scraping it out from time to time from a peculiar gland or cavity in which it is contained. When fresh, it is excessively strong, but grows milder by length of time.

The remaining genera of animals belonging to the *Feræ* or predacious tribe are the following, viz.

Ursus or Bear, comprehending many species.

Didelphis or Opossum, a numerous genus.

Macropus or Kangaroo, a genus greatly allied to that of Opossum in some points, but differing considerably in others, and not feeding on animal food, nor in strict propriety to be ranked in this order.

Talpa or Mole.

Sorex, or Shrew ; and lastly,
Erinaceus, or Hedgehog.

Of these genera the most remarkable are those of *Didelphis* and *Macropus*, Opossum and Kangaroo. The Opossum tribe is characterized by having small rounded front teeth, ten in the upper, and eight in the lower: the canine teeth are long, and the grinders are lobed or divided on their upper part. But the chief character of the genus consists in a peculiar cavity or pouch in which the parent places the young, immediately after their birth, and in which she preserves them till they are sufficiently advanced in growth to be able to defend and provide for themselves. In this pouch the teats are placed, which are six or eight in number. The Opossums are also often distinguished by the appearance of a thumb on the hind-feet, and in some species the tail is of that kind which Linnaeus calls prehensile, formed, as in some of the Monkeys, in such a manner as to be able strongly to coil round any object at pleasure.

The Opossums now constitute a pretty extensive genus of quadrupeds, many new species having been of late years discovered in Australasia or



VIRGINIAN OPOSSUM, from the Leverian Museum.



PETAURINE OPOSSUM



LEMURINE OPOSSUM

- New Holland; but the species first discovered is a native of North-America, and is said to be common in Virginia in particular. It is about the size of a Cat, with very thick fur, of a pale yellowish grey colour, and with a naked flesh-coloured tail, coated with a kind of scales like those on the tail of a rat, but larger. It resides in woods, and preys principally on birds and their eggs.

Among the New Holland Opossums the Lemurine Opossum is one of the most elegant: of the size of a Cat, of a fine dark-grey colour, yellowish beneath; with an exquisitely soft fur, and with a face much resembling the genus Lemur; the tail is long, deeply furred, and prehensile at the tip*.

A still more elegant kind of New Holland Opossum is the *Petaurine Opossum*, often measuring more than a yard in length from the nose to the tip of the tail. The *Petaurine Opossum* has the general appearance of a Flying Squirrel, being furnished with a broad furry membrane, from the fore to the hind-feet, by the help of which it springs

* *The Squirrel Opossum* or Did. *Sciurea* is also a New-Holland species of great elegance: it is of the size of the Grey or American Squirrel, and is of a pale grey above and white beneath, with the tail very full of hair, and tipped with black.



PYGMY OPOSSUM. *natural size.*



BLUEISH-GREY or SILVER KANGAROO

1808 Oct. London Published by G. Kearsley Fleet Street.

entirely herbivorous, and in reality should not be placed in the order Feræ. It is unnecessary to observe that the Kangaroo is one of the most elegant as well as curious animals discovered in modern times. The first discovery of this extraordinary quadruped, which had till then remained concealed as it were in a corner of the world, was in the year 1770, on that part of the coast of New-Holland which is now called New South Wales. The general size of the Kangaroo when full grown, is at least equal to a full grown sheep: the upper parts are small while the lower are remarkably large in proportion: yet such is the elegance of gradation in this respect, that the Kangaroo may be justly considered as one of the most picturesque of quadrupeds: the fore-legs are extremely short, with the feet divided into five toes, each furnished with a sharp and somewhat crooked claw: the thighs and hind-legs are extremely stout and long; and the feet are so constructed as to appear, at first sight, composed of but three toes, of which the middle is by far the largest, and is furnished with a claw of vast strength; and what appears on a cursory view, to be the inner toe, will be found, on a near inspection, to consist of two small toes,

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united under a common skin, with the respective claws placed so close to each other as to appear like a split or double claw. The Kangaroo rests on the whole length of the foot, which is callous, blackish, and granulated beneath, and bears a general resemblance to that of a bird. A popular error seems to prevail, that it never touches the ground with its fore-feet; but all who have contemplated the animal when at large, must have observed that it every now and then places the fore-feet on the ground; though its favourite attitude appears to be that of supporting itself, on its hind-feet, with the assistance of its tail, which is remarkably strong. This animal is observed to produce but a single young at a birth, which it carries for a great length of time in its ventral pouch, and which frequently emerges in quest of food or exercise, and again returns on the least alarm. Of the Kangaroo there seem to be different races or varieties, or perhaps even distinct species, the exact discrimination of which yet remains to be investigated. The common kind is of a pale brown colour; but some are of a dark iron-grey, and others of a very fine whitish or blueish grey.

COMMON
PORCUPINE.



Head, steep.

Wm. Jones sc. London Published by R. Knapley, Fleet Street.

GLIRES.

We are now to survey the remaining Orders of the Linnæan Mammalia, having passed through the three first.

The fourth Order is entitled *Glires* or Sleepers, from the Latin word *Glis*, signifying an animal of the Dormouse tribe.

The English term *Sleepers*, proposed by some Zoologists, must be confessed to be much too vague a term; since, though several Quadrupeds of this order lie dormant during a good part of the winter, yet the major part do not. The principal character of the animals of this order consists in a pair of very conspicuous, strong, and lengthened teeth, placed close together in the front of both jaws. They have no canine teeth, but are furnished with grinders on each side.

The first assortment or genus of the Glires is that of *Hystrix* or *Porcupine*, which, exclusive of the teeth, such as just mentioned, is distinguished, as every one knows, by the extraordinary covering of its body, which is beset, all over the upper parts,

with very long, strong, and sharp spines or quills, elegantly variegated with alternate zones of black and white. The common Porcupine, which is about the size of a small dog, is a native of many of the warmer regions of Asia and Africa, and even of some of the warmer parts of Europe. It is an animal of a harmless nature; feeding entirely on vegetable substances, as roots, barks of trees, and fruits. It inhabits subterraneous retreats, which it is said to form into several compartments or divisions, leaving only a single hole for entrance. It seems to admit of several varieties as to size, and length of its quills, and is distinguished, as a species, by having the upper part of the head crested as it were by long bristles.

It would be a waste of time to particularize the long-continued error (for such it, in a great degree, is), of the Porcupine possessing the power of darting its quills at pleasure, with great violence, and to a considerable distance, at its enemies: this notion seems now pretty generally exploded, and perhaps might have originated from some accidental circumstances; for the Porcupine, like most other quadrupeds, having the power of

contracting and shaking the general skin of the body, may sometimes, by this motion, cast off a few of its looser quills to some distance, and thus even slightly wound any animal that may happen to stand in its way; and this may have given rise to the popular idea of its darting them at pleasure against its enemies.

The poet Claudian, it is well known, has availed himself of this notion, and has represented the Porcupine in the usual stile of false wit so remarkable among the minor poets.

*“ Ecce, brevis propriis munitur bestia telis,
Externam nec quærit opem, fert omnia secum,
Se pharetra, sese jaculo, sese utitur arcu !”*

*“ Arm'd at all points in Nature's guardian mail,
See the stout Porcupine his foes assail;
And, urged to fight, the ready weapons throw,
Himself at once the quiver, dart, and bow.”*

There are several different species of Porcupine, one of the most remarkable of which is called the Canada Porcupine. It is of the size of a small or half-grown Beaver, and has, at first sight, so little of the appearance of a Porcupine, that it would hardly be supposed by any common

spectator to belong to the same genus; the fur, which is extremely full, and of a dusky brown colour, being much longer than the quills, which are only to be observed on a close inspection: these quills have their points barbed with many minute reversed spines, and are very apt to wound and adhere strongly to the skin of any animal that happens to make a close approach; and so conscious does this Porcupine appear of their power, that he is observed, when attacked, purposely to brush against the aggressor, leaving numbers of his spines infixed on his skin.

It will naturally occur to every one, that we have not yet particularly noticed an animal greatly allied in its general appearance to the Porcupine tribe: viz. the *Hedgehog*. But the *Hedgehog*, which, on a general view, might be associated with the Porcupines, is, in fact, widely removed from them in the structure of its teeth, which are perfectly those of the Order *Feræ*.

Perhaps the most extraordinary genus among the *Glires* is that of *Castor* or Beaver; it is characterized by the very strong pair of cutting teeth in each jaw, and, more strikingly, by the very singular structure of the tail, which is large, of a



COMMON BEAVER.

flattened oval form, and covered with large scales. The general length of the Beaver is about three feet, and its colour a fine, deep, chesnut-brown. The use of its fur is too well known to require particular mention, but it is to be observed that it is the under or inner fur, beneath the longer hair, that is used in the composition of so many articles of commerce, and varies according to the season of the year, the health of the animal, and many other circumstances.

The favourite resorts of the Beaver are retired watry and woody situations. In such places the animals assemble, and sometimes to the number of several hundreds, living in a kind of families, and building a sort of arched mansions, curiously lined or plaistered with clay. Of these a long and agreeable description may be found in the writings of Buffon. In such retreats the Beavers, which are always natives of cold climates, and particularly of the northern parts of America, pass the rigour of the winter months; feeding at intervals on the twigs and branches of the softer kind of trees, as willows, and poplars, great quantities of which they cut into proper lengths, and lay up in their cells. Sometimes, however, the

Beavers seem to forget their usual œconomy, and live in a less regular stile, straying about, and appearing to have merely a few common holes in the banks of the waters they frequent. It has been said that the Beaver fed entirely on fish; and the Count de Buffon, who delighted in such speculations, fancied this kind of diet to have been originally the cause of the flattened, scaly, and fish-like appearance of the tail of the animal; the organic particles of its fishy food having at length impressed on the Beaver something of a fishy form. It seems, however, pretty generally agreed that the principal food of the Beaver is of a vegetable nature.

From the Beaver is obtained the celebrated drug called *Castor*, which is the product of a particular gland, and is taken from the animal immediately after killing it: it is one of the strongest or most fetid of all animal substances, and is of very considerable use in medicine.

Linnaeus comprized a large tribe of animals belonging to the Order Glires, under one extremely numerous genus entitled *Mus*, or Mouse, or Rat: but the genus was by this rendered too extensive; and as many of the species admitted into it were

very different in habit or general appearance, it was at length thought better to distribute them into several distinct genera, leaving the Mouse or Rat tribe, strictly so called, to form the genus *Mus*.

Among the genera thus formed out of the old Linnæan genus *Mus*, one of the chief is that called *Cavia*, or, as it may be otherwise pronounced, çavia, in English *Cavy*.

As the characters of the teeth in almost all the Glires are very nearly similar, it is often unnecessary to particularize them. I shall therefore only observe, that the genus *Cavia* is in general of a thick and short form, and of various size. As the most familiar example, we may mention the well-known species improperly called the Guinea-Pig, which is now the *Cavia Cobaya*, or variegated Cavy, and was the *Mus Porcellus* of the earlier editions of the *Systema Naturæ* of Linnæus. It is a native of the hotter parts of South-America, and is now well known in most parts of Europe.

The South American animal called the Aguti or Java-Hare, belongs also to this genus, and is of the size of a Rabbet or larger.

The largest kind of Cavy yet known, is a spe-

cies not often to be found in the European Museums: it is called the Patagonian Cavy, and is considerably larger than a Hare, and of a pale brown colour, with a large black patch on the hind part of the body. It occurs in the Leverian Museum, and in that of the late Mr. John Hunter.

Another genus lately subtracted from that of *Mus*, is called *Arctomys* or Marmot. It contains but few species, most of which are of a thick form, with large, roundish, and somewhat flattened heads, and small mouths, which, when held open, appear longer in their perpendicular than their transverse diameter. The Marmots feed on roots, grain, and leaves, which they often collect into heaps; they reside in subterraneous holes or burrows, and sleep during the winter. The most common European species is the Alpine Marmot, a native of the Alps and the Pyrenean mountains. Its general size is rather superior to that of a Rabbet, and its colour a tawny grey. It inhabits the higher part of the Alps, in which situations several individuals unite in forming a subterraneous retreat, well lined with moss and hay, which they prepare during the summer, as if conscious of the necessity of providing for their long

sleep in winter. At the commencement of the autumnal frosts, they stop up the holes or entrances of their mansion, and gradually fall into a state of torpidity, in which they continue till the arrival of the succeeding spring.

The genus *Lepus* or Hare, is easily distinguished among the rest of the Glires: the cutting teeth in the upper jaw being disposed in a double pair; two small inner teeth being placed at the base of the large or outward pair. As this is a genus of which the history, (in the European species at least) is well known, I shall at present only particularize the distinction between the common Hare and the Rabbet, which two animals resemble each other so much, that the construction of a genuine specific character of each has been found a task of some difficulty; and it is a curious fact that the attempts at a specific character of the Rabbet in particular, by Linnæus, in the earlier editions of his *Systema Naturæ*, are remarkable for want of precision. The criterion proposed by the late Mr. Daines Barrington, in the *Philosophical Transactions*, has been adopted by modern systematic writers, and consists in the comparative length of the hind legs with that of

the body. In the Hare the hind-legs are longer than half the length of the back; in the Rabbet they are shorter.

The genus *Sciurus* or Squirrel, is so well characterized by the remarkable disposition of the hair on the tail, as to require no other explanation. I shall only observe that it is a numerous genus, that some of the exotic species are of very considerable size, and that some squirrels have a furry skin, stretching from the fore to the hind-feet, enabling them at pleasure to spring to a far greater distance than those species which are unprovided with such a lateral skin. The European Flying Squirrel is an elegant, but rather small species, found in Poland, and in some parts of Siberia, where it is chiefly said to inhabit birch-woods. Its colour is a beautiful pale grey, white beneath. In North America is a still smaller species of an elegant pale-brown colour, and which has been sometimes confounded with the former; and in some parts of Asia is a very large species, of a dark colour, and much allied in its general appearance to the Petaurine or Flying Opossum of New Holland,



Wm. J. G. S.

COMMON FLYING SQUIRREL.

The genus *Myoxus* or Dormouse, is principally distinguished from that of Squirrel by the form of the tail, which is round or cylindric; not flattened and spreading. The genus contains but few species. The common Dormouse is too well known to require any description. The chief or principal species is the *Glis* of the ancient Romans, which is the Fat Dormouse of Pennant, and is a native of the South of Europe, living in the manner of a Squirrel, but sleeping through the winter. Its size is not very far short of that of the common Squirrel, and its colour pale grey, white beneath.

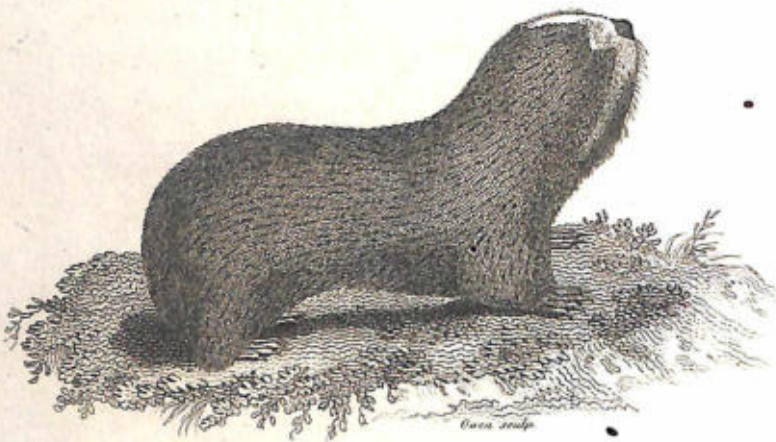
The genus *Mus* or Mouse, under which, as we have before observed, were once arranged a great many animals now placed under different genera, is still extremely extensive; comprehending all the species of the Rat and Mouse tribe strictly so called. Of these, the chief species known to our ancestors in this country was the black Rat, now become a rare animal in comparison with the brown Rat, introduced above a century ago from the Eastern regions, and vulgarly called the Norway Rat. It is at present the common Rat of our own country, and has, in a great de-

gree, destroyed the black Rat, or original English species: it is a size larger than the black Rat, and, as is well known, is of a brownish grey colour, white beneath. It is a native of India.

The Common Mouse needs no description, and the same may be said of our common field-mice, and the Water-Rat; but the beautiful *Harvest-Mouse*, first distinctly described as a British species by the late Mr. White of Selburne, claims our attention from its peculiar elegance. Its size does not much exceed half that of the common Mouse, and in its colour it bears a near resemblance to the Dormouse, being of a pale rufous brown above, and white beneath. It is common in some parts of Hampshire.

The exotic species of this genus are excessively numerous, and vary in size, from nearly that of a Rabbet to a degree of minuteness beyond that of the common small British species. Among the large exotic Rats one of the most remarkable is the *Mus Typhlus* or *Blind Rat*, a native of the Southern parts of Russia, where it burrows underground, and feeds on the roots of various vegetables. It usually measures about eight inches in length: is of a brown colour and destitute of a

HAMSTER

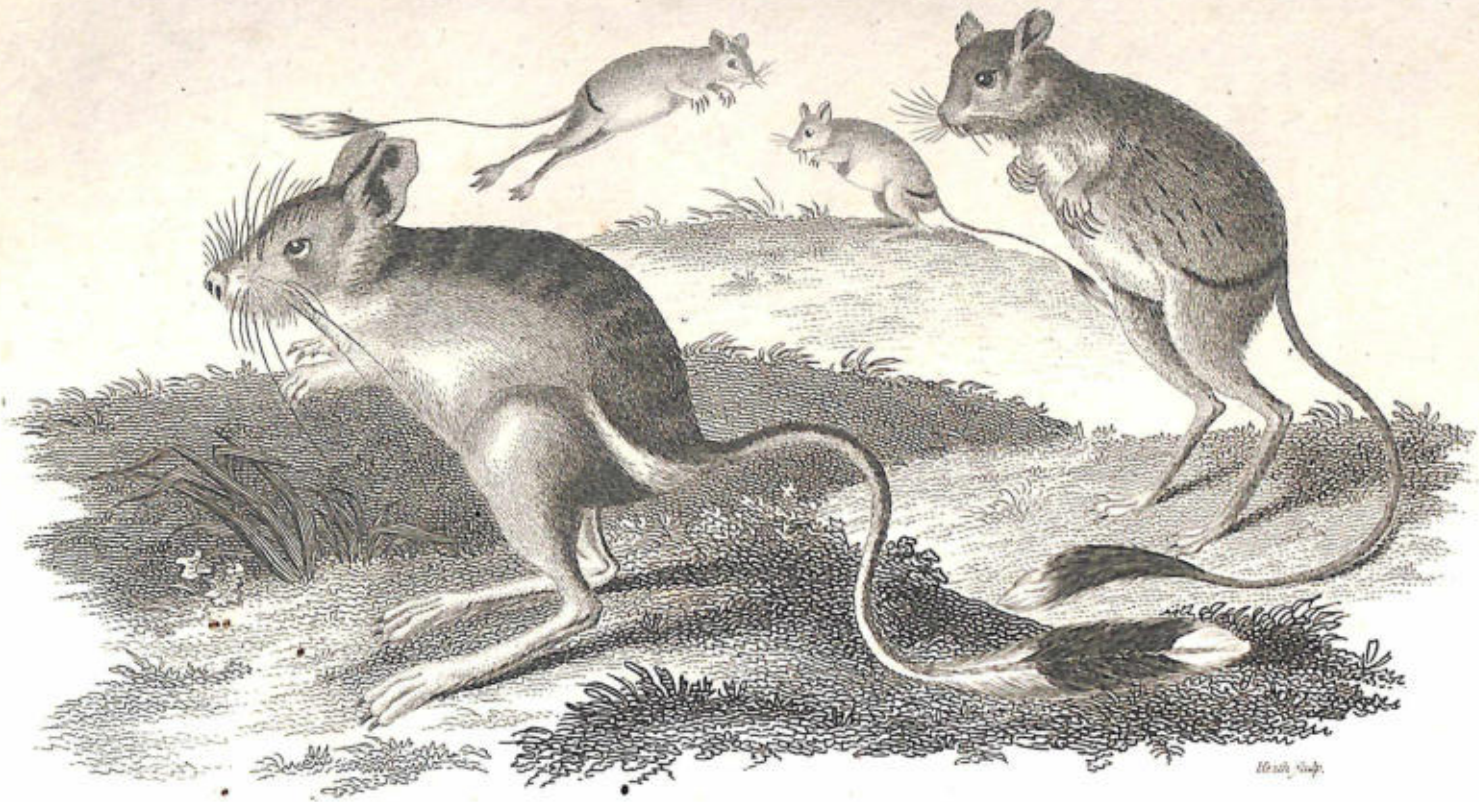


BLIND RAT

tail; but it is chiefly remarkable for the total want of external eyes, having merely two almost imperceptible rudiments of those parts, situated under the skin itself; so that it exhibits the only instance of a truly blind quadruped; for the *Mole* and some others, vulgarly considered as blind, on account of the extreme smallness of their eyes, have still those organs complete in all the usual parts; but the *Mus Typhlus* is totally blind. In return, its hearing is said to be uncommonly acute, enabling it readily to avoid all the general dangers to which it may be exposed.

Of the European Rats of large size the *Hamster* or *Mus Cricetus* is the most remarkable. It is of the general size of the brown Rat, but of a thicker form, and is of a pale reddish colour above, and black beneath; with, generally, two or three white spots on each side the fore-parts. On each side of the mouth the Hamster is furnished with a large membranaceous pouch or bag, which is capable of containing the quantity of a quarter of a pint English measure. This animal is an inhabitant of Germany, Poland, and Russia, and is often extremely destructive, by devouring vast quantities of grain, which it carries off in its

cheek-pouches, and deposits in its subterraneous retreat in order to feed on during the autumn. On the approach of winter the Hamster conceals himself in his deep cell, well lined with dried grass and moss, and falls into a state of the most profound sleep and entire torpidity; every animal function being so entirely deadened, that it is said the creature may be cut open without exhibiting any sign of sensibility: the heart, however, may be observed to contract and dilate alternately, but with a motion so slow that the pulsations do not exceed fourteen or fifteen in the space of a minute: the strongest stimulants are of no avail, and the electric shock may be passed through the animal without exciting any appearance of irritability. This lethargy of the Hamster has been generally ascribed to the effect of cold alone; but late observations have proved, that, unless at a certain depth beneath the surface, so as to be beyond the access of the external air, the animal does not fall into its state of torpidity; the severest cold, on the surface, not affecting it. On the contrary, when taken out of its burrow and exposed to the air, it infallibly wakes in a few hours. Its waking is a gradual operation, and



COMMON JERBOA.

See Jan's. Published by O. Knappe, Fleet Street.

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after several languid movements and profound inspirations, it opens its eyes, and endeavours to walk, but reels about for some time, as if in a state of intoxication, till at length it perfectly recovers all its powers.

Another singular species of Rat, furnished with pouches on each side the mouth for the temporary reception of food, is described in the fifth volume of the Transactions of the Linnæan Society, under the name of the *Canada Rat*; its size and colours nearly resemble those of the brown or Norway Rat, but it is somewhat paler, and of a yellower cast. Its way of life is supposed to be similar to that of the Hamster.

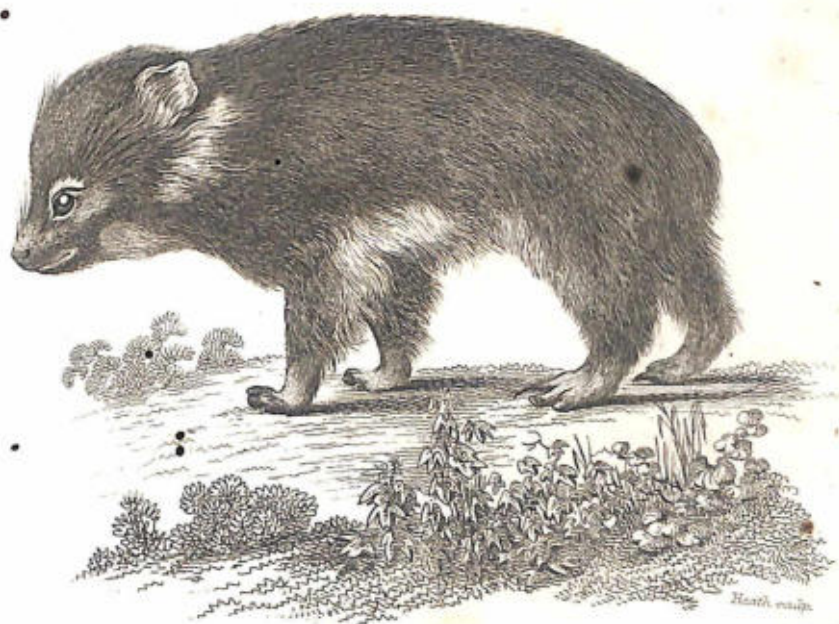
The genus *Dipus* or Jerboa is remarkable for the peculiar structure of the legs, of which the fore-pair are extremely short, and the hind-pair extremely long, giving the animal the appearance of a Kangaroo in miniature: the teeth resemble those of the rest of the Glires, and there is no ventral pouch as in the Kangaroo: otherwise these animals and the Kangaroos might almost admit of being placed in the same assortment. The common *Jerboa*, of which there are some varieties as to size and colour, is a native of many

of the Eastern and Southern parts of the world; frequenting dry and sandy places, where it burrows under the surface and conceals itself during the day, coming out to feed during the night. Its general attitudes are those of a bird, hopping on its hind-legs, and when pursued, springing, by vast and quickly repeated leaps, to a great distance, so as not to be easily overtaken by the swiftest of quadrupeds. The general size of the common Jerboa is that of the common or brown Rat, and its colour pale yellowish-brown, white beneath; the tail very long, and elegantly terminated by a feather-shaped tuft, of a black colour, tipped with white. It is well represented in the works of Bruce, Buffon, Edwards, and other modern authors.

The genus *Hyrax*, which concludes the Order Glires, is of rather late institution, and consists of two species, each about the size of a common Rabbet, and of nearly similar colour. The genus *Hyrax* differs from all the rest of the Glires in the front teeth of the lower jaw, which, instead of two, are four in number, rather broad, and notched at the edges or tips. Of the two species of *Hyrax*, one is the *Ashkoko* of Mr. Bruce, which



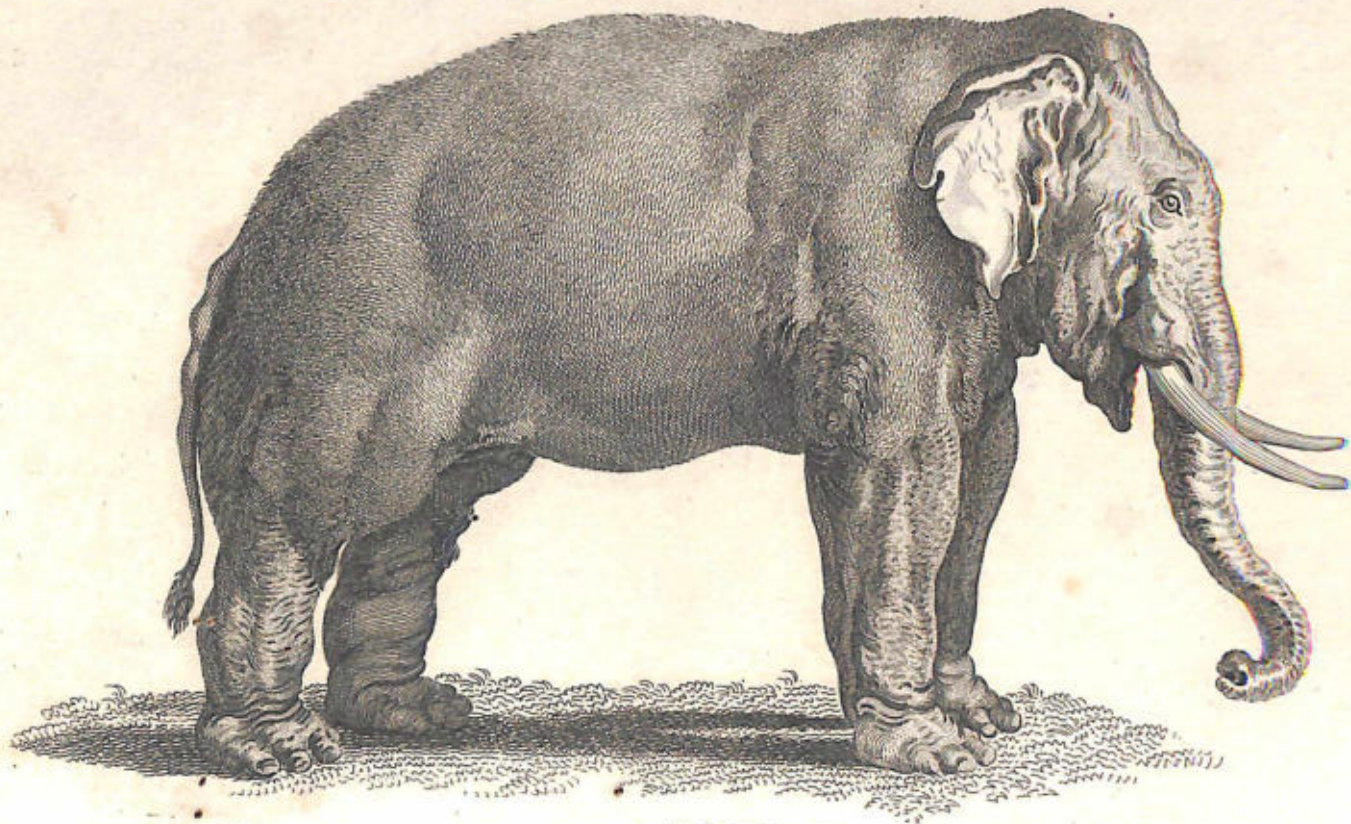
SYRIAN HYRAX.



CAPE HYRAX.

he supposes to be the *Saphan* of the sacred writings. It is found in several parts of Africa, and inhabits the cavities of rocks.

The other species is the Cape Hyrax, a native of the Cape of Good Hope, inhabiting similar situations with the former.



ELEPHANT.

1800 Feb. Published by G. Kearsley Fleet Street.

Woolf del.

LECTURE IV.

WE now turn our attention to the next order of Mammalia, which is a very extensive one as to species, though the genera are not numerous. This order is entitled *Pecora*, and contains all the Cattle, commonly so called, as Oxen, Sheep, Goats and others. It also comprises the Camelopardi, the Deer tribe, the Antelopes, the Musk and some others. In this order also, at present, though perhaps not quite of a similar nature with the rest, we may be permitted to rank the Elephant, which in its manners or habits resembles the *Pecora*, though it does not ruminate, and is not furnished with any front-teeth.

In the Linnæan arrangement the Elephant is placed among the *Bruta*, from the want of fore-teeth. By Mr. Pennant it is arranged under the

cloven-hoofed Order, in which stand the Linnæan *Pecora*. By Monsieur Cuvier it is considered as constituting an Order distinct from all others. The mouth is usually furnished with one very broad grinder on each side both above and below, and with two upper tusks. The general appearance, and even the general history of the Elephant is pretty well known to most persons. It is a native of the warmer regions of Asia and Africa, where it is chiefly seen in woody regions, and feeds entirely on vegetable substances, as the tender shoots of trees, and various kinds of fruit and grain. The Elephant drinks by means of its trunk, first sucking up the water into it, and then conveying it to the mouth. The intelligence and docility of the Elephant are well known, and are generally detailed, with sufficient enlargements in most of the common publications on Natural History. I shall here only observe that in general the intelligence of animals is in proportion to the size of the brain: yet in the Elephant that part is by no means large.

In some parts of North-America, are often found fossil bones bearing a general resemblance to those of the Elephant, and commonly known

by the title of Mammoth bones: the teeth however, (that is the grinders,) are of an appearance widely different from those of the Elephant, being deeply lobed on the top, like those of Carnivorous animals. Of this curious, and at present unknown animal in a recent state, the complete skeleton has been of late discovered in North America, and was, as is well known, exhibited in this metropolis. Every one must have been struck with its general similitude to that of an Elephant, but the grinders or lateral teeth, as before observed, are of a very different appearance, and seem to indicate an animal of a carnivorous nature. By Mr. Pennant this animal is considered as a species of Elephant, under the title of the *American Elephant*, and he seems to be of opinion that it may yet exist in some of the remote parts of the American Continent yet unvisited by Europeans. Others have supposed it an animal of an extinct species, and in reality allied only to the Elephant in the general size and appearance of its bones, while some particular parts seem to prove a different tribe, and there have not been wanting some, who have even imagined it to be a marine animal. All however is at present conjectural on

this subject, and it can only be mentioned as one of those interesting zoological curiosities which will probably long continue to remain imperfectly understood.

One of the great or leading characters of the Order *Pecora* or Cattle, to which we now proceed, is the total want of front-teeth in the upper jaw. In the lower jaw there are six or eight front-teeth: the grinders or side-teeth are usually pretty numerous, and such of the *Pecora* as are furnished with horns, have no tusks or canine-teeth; which on the contrary are conspicuous in such as are not furnished with the defence of horns. Another character belonging to most of this tribe of Mammalia is the power of rumination, or ruminating: that is, of throwing up into the mouth at intervals a portion of the food which has been hastily swallowed during their feeding, in order that it may undergo a more complete grinding by the teeth. This action is so conspicuous in Cows and other cattle, that every one is perfectly acquainted with it. The stomachs of these animals and of others that ruminate, are wonderfully calculated for facilitating this necessary operation, and may be found described at large, accompanied by proper expla-

natory plates, in the ingenious observations of Daubenton, annexed to the quarto edition of Buffon's History of Quadrupeds.

All the Pecora or Ruminants as they are often called, are hoofed; and in the major part the hoof is divided into two principal parts, with the addition, in many, of two very small undivided hoofs or processes on each side, or rather behind the principal ones.

In the Camel the structure of the foot is peculiar; the sole or part beneath the hoofs, being swelled into a kind of elastic pad, covered with an extremely strong, but flexible skin, admirably adapted for enabling the animal to travel over the dry and sandy deserts which it is chiefly destined to inhabit.

The whole Order *Pecora*, without an exception, feeds entirely on vegetable food. Of these genera I shall only particularize a few of the most remarkable. One of these is the *Camelopardi*, or *Giraffa*.

The most curious or singular genera in the Linnæan Pecora, or Ruminant tribe, are those of *Camelopardi*, *Camel*, *Musk*, and *Antelope*. The *Camelopardi*, which is the *Camelopardalis Giraffa*

of the modern editions of the *Systema Naturæ* of Linnæus, was once considered as a species of Deer; but it differs from the Deer tribe in its horns, which are never cast, but are permanent, simple or unbranched, covered by a skin, and terminated by a tuft of short bristles. The Camelopardi or Giraffe is the tallest of all Quadrupeds, often measuring seventeen feet from the top of the head to the soles of the fore feet: its neck is of a vast length, and the fore-parts of the animal appear, on account of their conformation, to be considerably higher than the hinder. The whole aspect of the Camelopardi is at once singular and elegant in the highest degree: its colour is a very pale yellowish or whitish brown, with numerous, large, squarish spots of light chesnut-colour. The history of this animal has been much elucidated of late years by the researches of various African travellers, and specimens of the complete skin have been brought into Europe, of which one of the finest is in the Museum of the late Mr. Hunter; now the Museum of the College of Surgeons. Mr. Pennant, in his *History of Quadrupeds* observes, that, had he not seen the dried skin of the Camelopardi,

GIRAFFE.





ELK.

See Jan. 5. London Published by G. Kearsley, Fleet Street.

he should have been almost inclined to entertain doubts as to the existence of so extraordinary an animal. It was however well known to the ancient Romans, who sometimes exhibited it to the people in their public shews; and its representation occurs in the celebrated remain of antiquity generally called the Prænestine Pavement.

The Deer tribe or the genus *Cervus* is characterized by having branched horns, which are annually deciduous, falling off at a particular season, being gradually replaced by others. Of the Deer tribe the largest species is the *Elk*, (*Cervus Alces*. Lin.) a native of the northern parts of Europe and America, in which latter it is called by the name of Moose. The Elk is not an animal of an elegant shape, having a large head, and a very thick short neck: its colour is a dark greyish brown.

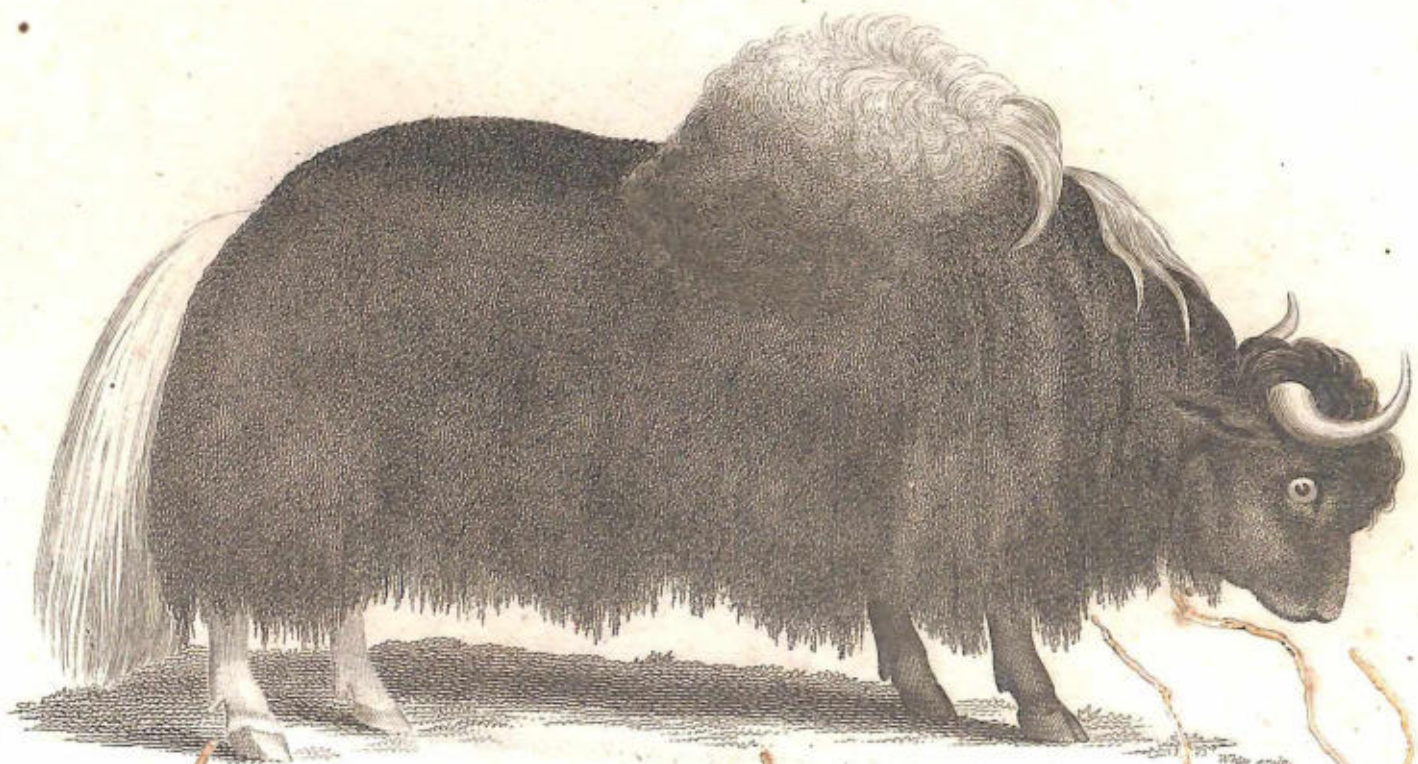
The *Stag* or red Deer, (*C. Elaphus* Lin.) on the contrary may be considered as one of the most elegant of the whole tribe: its colour is a strong reddish brown, and its horns are branched, or divided into many round, and sharp-pointed processes. It is a native of the wooded parts of Europe, and particularly of Germany.

The *Fallow Deer*, (C. *Dama*. Lin.) is the species so generally seen in our parks, and is distinguished by having the horns dilated into a broad, subdivided expanse at the upper parts. In colour it varies greatly, as do most animals when in a state of captivity.

Rein-Deer. C. *Tarandus*.—A moderately large species of a grey colour, and with slender horns of great length, dividing into numerous processes. This species, as is well known, constitutes a great part of the wealth of the Laplanders, and is most providentially ordained to support that simple and harmless people with many of the chief conveniences of life.

The *Ox tribe*, or the genus *Bos*, is distinguished by having bent or lunated horns, which are permanent, and have a core or central bony part, on which the horny shell is mounted. The Wild Ox or Urus, is found in the more northern parts of Europe and Asia, and from it have been gradually derived all the breeds of domestic cattle.

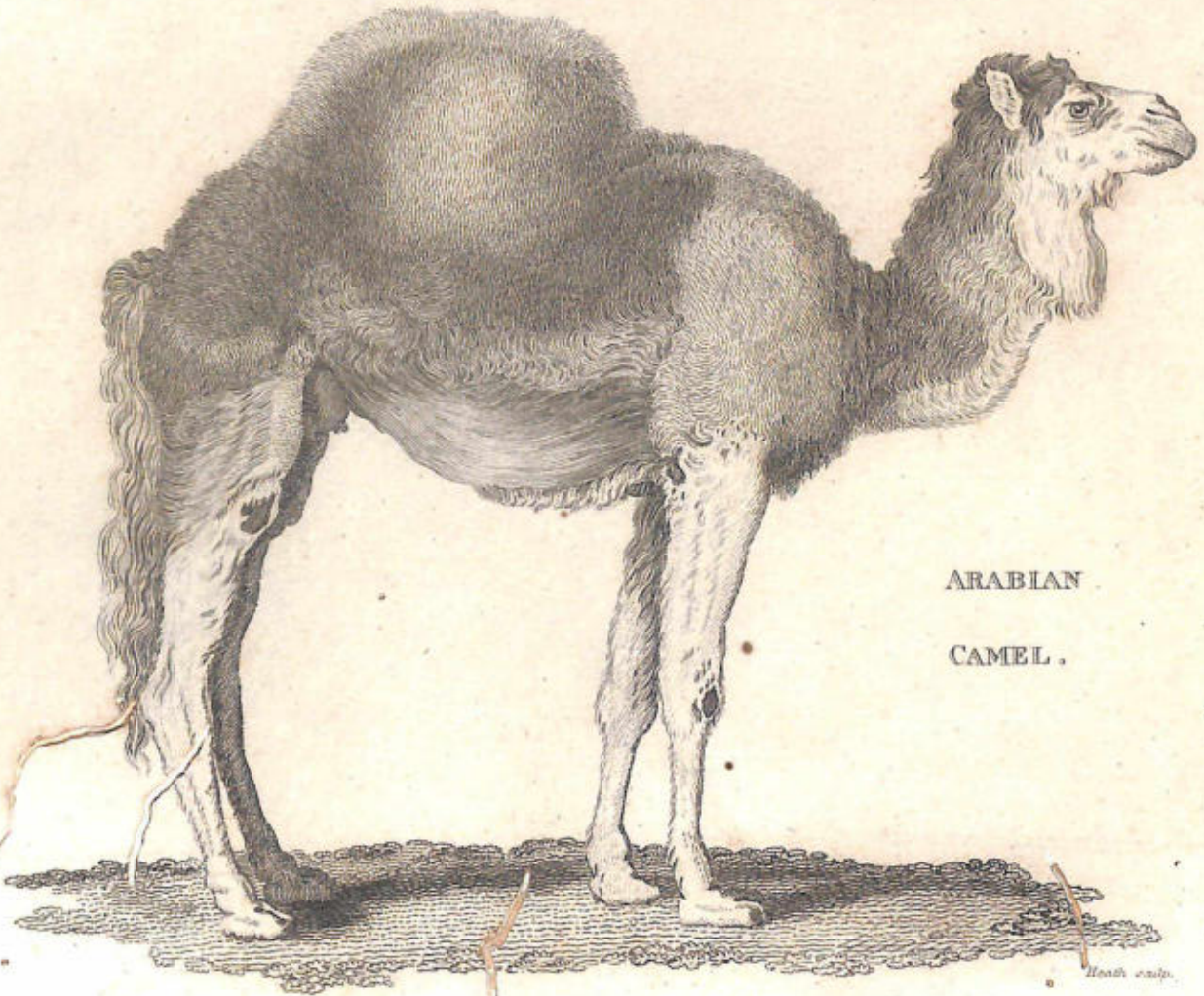
One of the most remarkable species of this genus is the *Bos grunniens* of Linnæus, or grunting Ox, so named from its voice. Its size is that of a small bull; and its colour blackish brown: it



YAK

1801. Jarr' & Co London. Publish'd by G. B. Arisley, Fleet Street.

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ARABIAN
CAMEL.

Heath's engr.

is covered with long woolly hair, and is remarkable for the vast length and fulness of the hair on the tail, which is of a silky softness, of a milk-white colour, and reaches to the ground. The tails of this species of Ox, which in its native country of Tartary, is called the *Yak*, are used by persons of fashion in China, India, and other parts of the Eastern world, by way of fly-flaps, and are carried, on some occasions, as ensigns of authority.

The genus *Camelus* or Camel contains the Camel and Dromedary, the Lama, the Vicuna, and a few other species of inferior note. The *Camel* and *Dromedary* are pretty well known to almost every one: the *Camelus Dromedarius* of Linnæus or Arabian Camel has a single elevation or bunch on the back: the *Camelus Bactrianus* of Linnæus or Bactrian Camel has two; but the names of Camel and Dromedary are differently applied by different writers, which sometimes causes a degree of confusion when speaking of them. It has been supposed by some that they constitute in reality but one species, varying either with a single or double elevation on the back. These animals are of the greatest possible

utility to the inhabitants of many of the Asiatic and African regions, since with a very small portion of food they can travel for several days together, and can also suffer a long abstinence from water. The admirable contrivance of Nature for enabling the animal to do this must by no means be omitted. This consists in the stomach of the Camel and Dromedary being so formed as to be divided internally into a vast many separate cells or cavities; and as the whole organ is of great size, when the Camel drinks, it takes in a very large quantity of water, which is preserved in the cells of the stomach, and is, at the pleasure of the animal, thrown back into the mouth, in order to refresh that part when heated and parched by the sun and dust.

The genus *Moschus* or *Musk* is distinguished by having no horns, and in the mouth being furnished with long, sharp, crooked tusks, one on each side, directed downwards, and reaching nearly two inches beyond the lips. The common Musk is an inhabitant of the mountains of Thibet, and is of the size of a Roebuck, and of a deep iron grey colour. The substance called Musk, by far the most powerfully diffusive of



MUSK

all animal odors, (if we except that of some of the American Viverræ, before mentioned) is contained in a small pouch about the size of an egg, situated beneath the body; and is of an unctuous substance, and of a reddish brown colour. When fresh, it is said to be so excessively powerful or penetrating, as to force blood from the nose, eyes, and ears of those who incautiously smell it. It forms, as is well known, an article of commerce, and is used both as a medicine and a perfume*.

To this genus belongs a very elegant little quadruped, about the size of a small cat, and called the Pygmy Musk. It is found in many parts of Java and Sumatra, but is of so tender a nature as not to be capable of being brought alive into Europe. It is distinguished as a species, by the total want of the small or secondary hoofs behind the larger pair on each foot, and which are found in almost all the rest of the Cattle tribe. To this little species of Musk also belong the very minute legs with their hoofs, sometimes

* It has been also observed that the smell of musk is not easily discharged even from metallic substances themselves which have been rubbed with it.

seen in Museums, and which do not much exceed the size of a quill in diameter. They have often been tipped with gold and used for the purpose of a tobacco-stopper, and are sometimes called by the mistaken title of the legs of Greenland Deer.

In the Order *Pecora* we find a very extensive genus under the title of Antelope, forming the modern genus *Antilope*, (for Linnæus arranged the few species then known, among the Goat tribe.) The Antelopes are in general remarkable for the elegance of their appearance. The common Antelope or *A. Cervicapra* is a native of many parts of Asia and Africa, its general size is somewhat smaller than that of a fallow deer, and its colour a tawny reddish-brown above, and white beneath: the horns black, of a peculiarly beautiful form, having a double flexure, first inwards, and again outwards, and they are elegantly and distinctly marked, throughout almost their whole length, by numerous prominent rings or circles. The Antelopes in general inhabit the hottest regions of the globe: their swiftness is proverbial, and it is observed that most species are of a gregarious nature, forming herds of many hundreds or even thousands together. For



COMMON ANTELOPE.

male & female.

figures of this numerous and elegant tribe I must refer to the work of Schreber, where they are collected from the works of Pallas and many other describers. In the Leverian Museum, so unfortunately doomed to dispersion, may be found some of the most curious kinds.

Of the *Sheep* and *Goat* tribe, or the two Linnæan genera of *Ovis* and *Capra*, it may be sufficient to say, that the species which is supposed to be the origin of the Common Sheep in all its varieties, is the *Argali*, a large and handsome animal, found in many of the mountainous regions of the Eastern world. In this its natural state it is rather covered with hair than wool, and is of a pale tawny-brown colour, with very large horns.

The *Common Goat*, in all its varieties, is supposed to have descended from the animal called the *Ibex*, a large and very active quadruped, found in situations not dissimilar to those in which the *Argali* or Wild Sheep is seen. The *Ibex* is of a brown colour, with excessively large and long horns, bending or curving backwards, and marked above by rows of transverse knobs or half-circles.

The chief distinctive character between the two genera of *Ovis* and *Capra* or Sheep and Goat, is that in the former the horns have a spiral curvature; in the latter a simple one.

The next, or 6th Linnæan Order of Quadrupeds is called *BELLUÆ*, a word which cannot admit of any very distinct English corresponding word. We must be content to take the Linnæan term in its original shape. This order, *Belluæ*, consists, in general, of animals either of large or moderate size, and comprizes the *Rhinoceros*, *Horse*, the *Hippopotamus*, the *Tapir*, and the *Hog*.

Of these Genera we surely need not particularize that of *Equus* or Horse, any otherwise than to say, that the common Horse is a native of the Eastern regions, in which it is still seen in a state at least approaching to that of natural wildness, and that the cultivated or improved races of the Eastern countries are allowed to excel all others in swiftness as well as in beauty.

The *Ass* belongs to the same genus, and, like the Horse, is a native of the East, and is an animal of great elegance and fleetness; and by no means to be judged of from its degraded descendents in the European regions, where it

ZEBRA.



Not. Jan. 17. London Publish'd by G. Kearsley Fleet St.

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generally appears under every possible circumstance of disadvantage.

But, so far as regards mere beauty, the African species of this genus, called the *Zebra*, must be confessed to stand superior to almost every other quadruped, even the Tiger itself scarcely excepted. The Zebra, as every one knows, is distinguished by its numerous ribband-like, brown stripes on a cream-coloured ground. The Zebra has not yet been brought into a state of complete domestication; its native wildness still preventing every effort at rendering it serviceable in an economical view.

Lastly to the genus *Equus* or Horse is referred an animal, discovered of late years in the mountainous parts of Chili in South-America, and distinguished by the title of the Cloven-footed Horse. The chief character of the genus Horse (exclusive of the teeth,) consisting in the hoofs being perfectly entire or undivided, it follows that the animal just mentioned, must be considered as constituting a very anomalous species, contradicting in part, the generic character of the rest. But as nature scorns all artificial arrangements, we cannot presume to suppose that

she may not have produced a species of this extraordinary cast. The Cloven-footed Horse was first described by Molina, in his Natural History of Chili: In its general appearance, size, and colour, it resembles the Ass, but has the voice of the Horse, and the hoofs are divided, like those of ruminant-animals. One might be induced to suppose that Molina, from its general appearance, might have chosen to consider it as a species of Horse, but that it really belonged more properly to the Antelope tribe; but this supposition is contradicted by its anatomical structure, which resembles that of other animals of the Horse genus. It must therefore be considered as one of the most remarkable animals yet discovered.

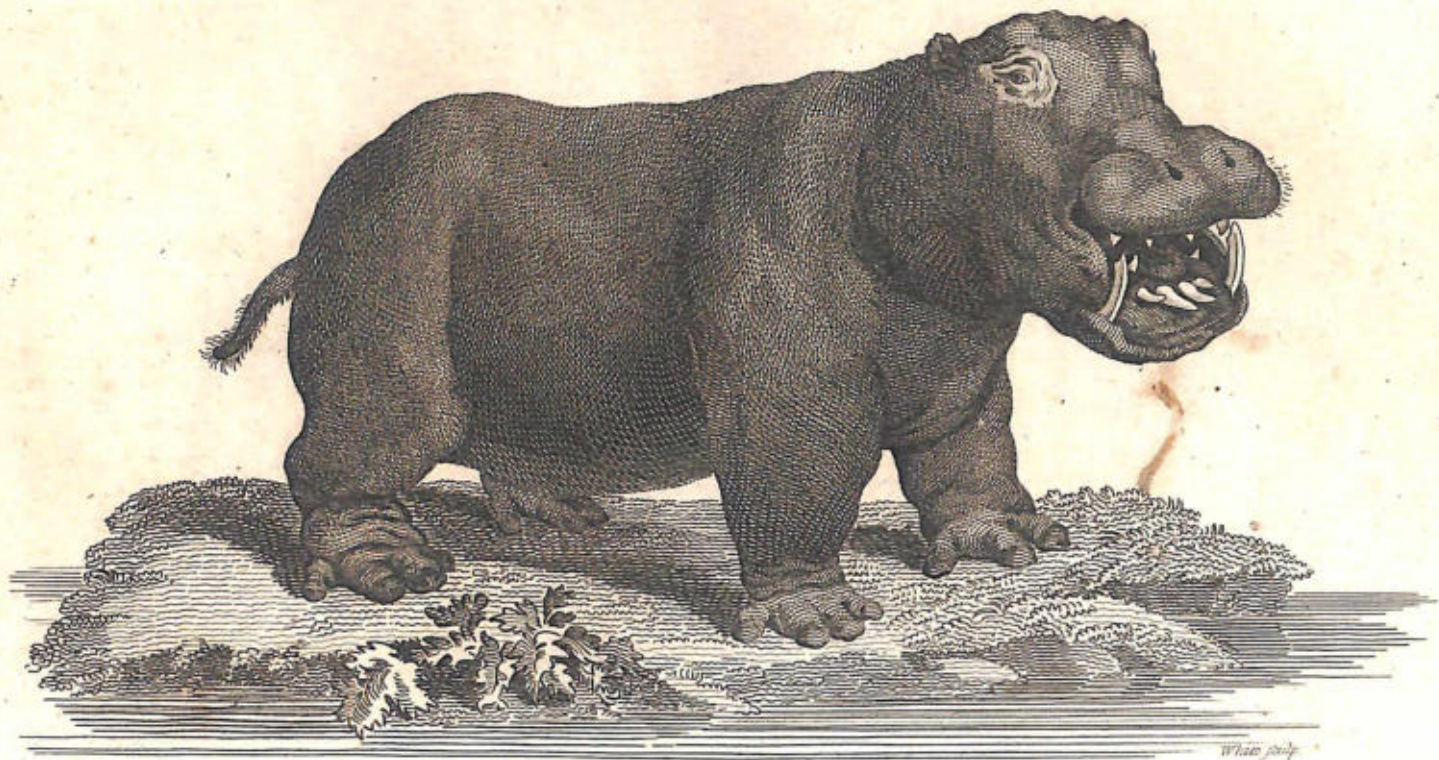
The genus *Hippopotamus*, of which we only know of one species, is a highly singular genus. The front-teeth in each jaw are four; and the tusks, which are single on each side, are very large: the feet are each furnished with four hoofs. The Hippopotamus is a very large animal: its general size equalling that of the Rhinoceros: in its mode of life it is Amphibious, concealing itself during the day in large rivers, out of which

it only raises its nostrils at intervals, in order to breathe; and coming out by night to graze, feeding entirely on vegetables. Its form is highly uncouth; the body being extremely large, fat, and round; and the legs very short and thick: the head very large, with short rounded or very slightly pointed ears, an extremely wide mouth, with teeth of a vast size and strength; particularly the tusks, or canine-teeth of the lower jaw, which are of a curved form, streaked on their outside with numerous furrows, and appear as if obliquely cut off at the tips. These teeth sometimes measure more than two feet in length. The skin of the Hippopotamus is smooth, but is thinly covered with short hairs. When the Hippopotamus first emerges from the water, it is observed to be of a brown colour, accompanied by a blueish cast; but when dry, is of an obscure brown. It is naturally of a harmless disposition, but if pursued or wounded, is said to become excessively furious, and to be capable of easily overturning a canoe or boat, and has sometimes been known to sink them, by biting large pieces out of the bottom. The young are capable of being tamed, and we are told by Be-

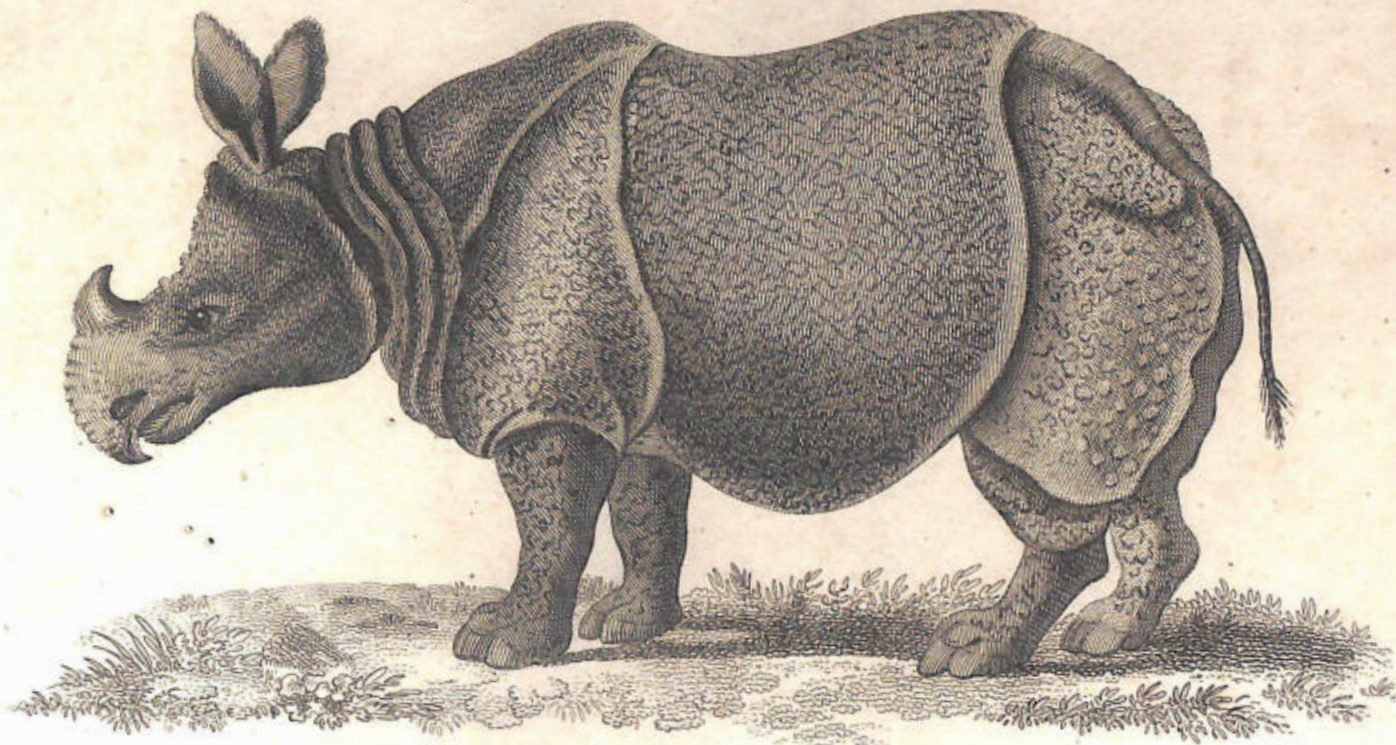
lon that he saw one in that state. The Hippopotamus is a native of the large African and Asiatic rivers, and is sometimes seen in herds. The tusks are much esteemed as a species of ivory, being more hard, and less liable to change colour than those of the Elephant: they are therefore in great use among the dentists. I shall add, that the Hippopotamus was known to the ancient Romans, and that Pliny tells us that *Scaurus* a Roman *Ædile*, treated the people of Rome with the exhibition of an Hippopotamus accompanied by four Crocodiles, all brought out of Egypt, and exhibited in a temporary lake, prepared for that purpose.

The genus *Rhinoceros*, which some naturalists have placed, like the Elephant, among the *Bruta* of the Linnæan arrangement, is distinguished by the remarkable circumstance of a horn or process situate above the nose. The mouth is furnished in each jaw with two teeth, placed at the corners of the jaws in the manner of canine-teeth; and in each jaw are six grinders on a side. The general height of the *Rhinoceros* is about eight feet, but specimens are said to be occasionally seen which nearly equal the

HIPPOPOTAMUS.



1801 Jan. 1. London. Published by G. Knorr by Fleet Street.



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SINGLE-HORNED RHINOCEROS.

After F. B. London. Published by G. Knapp, Fleet Street.

Smith, 1840

Elephant in size. The skin of the Rhinoceros is strong and hard, of a dusky brown colour, and disposed, on the upper parts of the animal, in such a manner as to form several strong pleats about the fore and hind parts of the body: on the lower parts it is of a softer nature: the feet are each divided into three large hoofs, all standing forwards. The Rhinoceros at full growth has the appearance of an animal invested with a kind of armour, on account of the strongly-marked folds and tubercles of the skin. There exists a curious plate of the Rhinoceros, by Albert Durer, in which he has so far exaggerated these particulars, that the creature appears as if actually in a complete suit of armour of the most elaborate workmanship. This figure by Albert Durer is repeated in the works of Gesner and Aldrovandus, and many others, and seems to have long continued a kind of standard representation of the animal. The best general representation is perhaps that in the works of Buffon. So large is the horn of a full-grown Rhinoceros, as to exceed the length of three feet: it is of a black colour, solid, smooth except at the base, curved backwards, and sharp-pointed. The Rhinoceros is principally a native

of Asia and Africa, where it is still seen in considerable numbers, living in woody regions, and feeding on the young shoots of trees. In some parts of Africa is also found another species, called the two-horned Rhinoceros, having two horns on the nose, one behind the other: this species, which is of equal size with the common or single-horned Rhinoceros, is farther distinguished by having a much smoother skin than that of the single-horned species, and which (in the younger specimens particularly,) exhibits hardly any of the roughnesses or folds which distinguish the common kind. The ancient Romans had undoubtedly seen a two-horned Rhinoceros exhibited; since the circumstance is particularized in an Epigram of Martial, who, in speaking of the combat between this animal and a bear, says that it threw up or tossed the bear with its double horn as easily as a bull would a bag of wool. The animal also appears with a double horn on a coin belonging to the reign of Domitian. It is well known that the celebrated Mr. Bruce has been much censured for having figured in his travels the two-horned Rhinoceros as perfectly resembling in every other

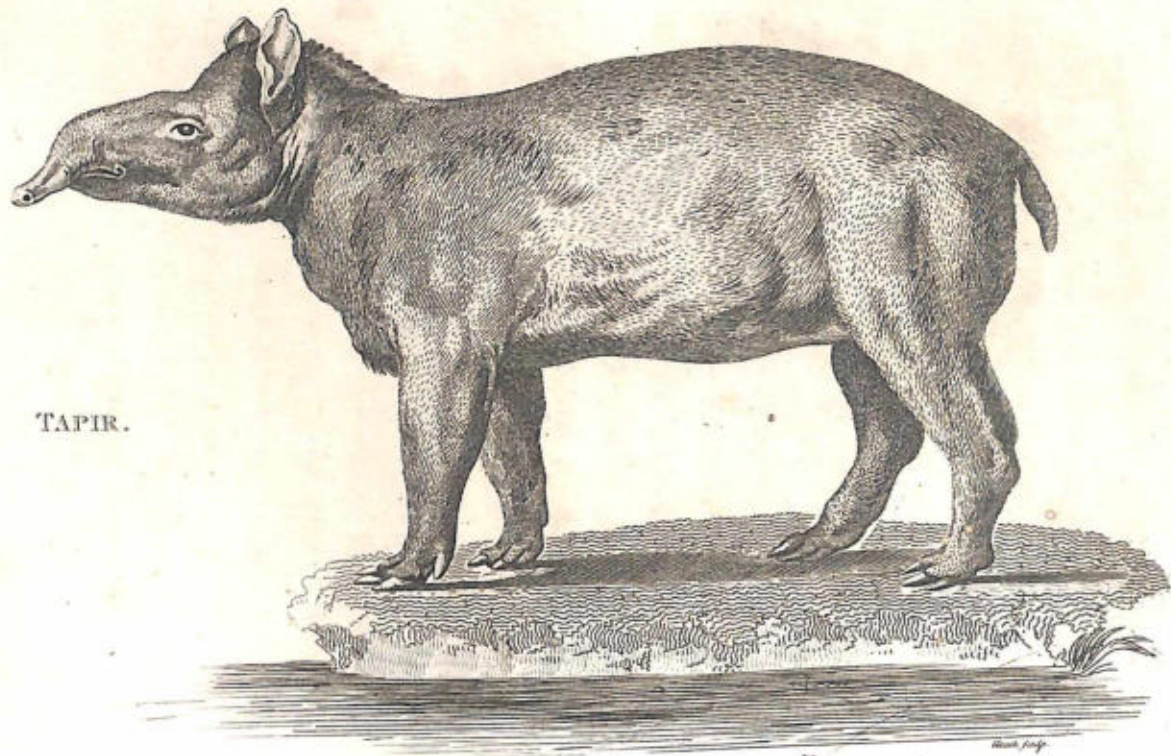
particular the common or single-horned species: it is also certain that the figure given in Mr. Bruce's work is absolutely a copy from Buffon's figure of the common Rhinoceros, with the addition merely of a second horn. It does not however follow from this circumstance that Mr. Bruce's figure is deceptive; and it is surely no improbable circumstance that the common Rhinoceros may vary with a double horn; in which case Mr. Bruce, knowing Buffon's figure to be correct, might have thought it unnecessary to be at the trouble of causing a completely new figure to be executed.

I must add, that Mr. Bruce's description of the manners or habits of the animal, is an interesting and even a sublime composition; and I recommend it to all who wish for an animated account of so extraordinary a quadruped.

The genus called *Tapir* consists of a single species only, and is distinguished by having numerous teeth, amounting in all to no fewer than *forty-two*: namely six front or cutting-teeth above and below; two canine-teeth above and below, and twenty-six grinders: the nose is lengthened out into a short proboscis, and the feet are each

divided into three narrow hoofs in front, with the addition of a small or spurious hoof behind each of the fore-feet. The Tapir is a South-American animal, nearly equal in size to a heifer. Its colour is an obscure brown, and the skin is but sparingly covered with hair. It is an animal of harmless manners, wandering about the woods, and feeding on the young shoots of various shrubs. It has been occasionally brought alive into Europe, and a well preserved specimen occurs in the Museum of Mr. Hunter.

The genus *Sus* or Hog, concludes the enumeration of the Linnæan Belluæ. It is characterized by having four front-teeth above, and six below: two short tusks or canine-teeth in the upper jaw, and two very long and curved ones in the lower jaw, projecting upwards from the mouth: the snout is prominent, moveable, and abruptly terminated; and the feet are divided into two large, and two smaller hoofs, all pointing forwards. The wild Boar, which is supposed to be the stock or origin of all the domestic breeds, is a native of almost all the temperate and warmer regions of the ancient Continent. It is, in general, of smaller size than the domestic Hog, and is of a dark grey



TAPIR.

colour. Between the bristles, next the skin, is a much finer and softer kind of hair, of a somewhat woolly or curled nature: but the principal difference between the wild Boar and the domestic is the size of the tusks, which in the wild Boar are often several inches in length, and capable of inflicting the most severe and fatal wounds. Though the general size of the Wild Boar is inferior to that of the domestic, yet instances have occasionally occurred in which the animal has been seen of a size so enormous as far to surpass the general measure of its tribe, and to render credible the seemingly extravagant recitals which sometimes occur in the works of ancient authors.

* PINNATA.

WE are now to take a view of the *pinnated Mammalia*, or those in which the divisions or toes of the feet are connected by webs; enabling the animals, whose principal residence is in the waters,

to swim with far greater facility than any other quadrupeds, while, on the contrary, they walk with much greater difficulty.

In the Linnæan System, in which, perhaps, too great a degree of attention is paid to the characters of the teeth, these quadrupeds are somewhat awkwardly arranged; making their appearance in detached parts of the class Mammalia. In this instance therefore we shall depart from the Linnæan arrangement, and pursue that of Mr. Pennant and others; making a separate order for the pinnated quadrupeds, which will thus be made to lead, by a natural transition to the Cetaceous Mammalia, or Whales. I need hardly observe, that by the pinnated or web-footed Mammalia, must be understood those only which are strikingly and conspicuously distinguished by webs on all their feet, and not those which are partially web-footed, as the Otter, Beaver, and many others.

Of the truly pinnated quadrupeds we are acquainted with but two distinct genera, viz. that of *Phoca* or *Seal*, and that of *Trichechus* or *Manati*.

The first genus, or *Phoca*, (*Seal*;) is entirely

COMMON SEAL.



PIED SEAL. var:

1806. Febl. London Publish'd by G. Knapp, Fleet Street.

Heath, fecit.

marine. It is characterized by having *teeth*, similar in form and disposition to those of the order *Feræ*: while the feet are so formed as to resemble a kind of leathery fins, through which are very distinctly traced the toes, which are terminated by slightly lengthened nails or claws. Though the whole genus *Phoca* is aquatic, yet it is so constituted as to require occasional intervals of repose, and even a considerable degree of continuance on dry land; forsaking at particular periods the water, and congregating in multitudes on the shores, on floating ice, or on insulated rocks, and this especially at the season in which the young are produced. The most common species, or that which seems to have been known from times of remote antiquity, is the *Phoca vitulina* of Linnaeus, the *common Seal*, or *Sea-Calf*, as it is frequently termed. It is a native of the European seas, and is chiefly seen in the northern regions. Its size varies, but its general length seems to be from five to six feet, and its colour grey or grêyish brown: the head is large and rounded, without any appearance of external ears: the neck small and short; the parts about the shoulders and breast very thick, the body tapering

thence towards the extremity: the legs are so very short as to be scarcely perceptible, but the feet are large, and the hinder ones are so placed as to be of the highest use to the animal in swimming, being situated at the extremity of the body, and close to each other: the tail is very short: the whole animal is covered with short, thick-set, glossy hair, and its general colour is a dark greyish brown. In this respect, however, it is known to vary, like most others of its genus, being sometimes seen spotted or variegated. Like the rest of the genus it feeds on various fishes, shell animals, and marine plants. A species much resembling this, but larger, is often seen about some of the European coasts: it differs in having a somewhat more lengthened snout than the common Seal, and is generally black above, and white beneath, but, like the former, it varies in colour. It is the *Pied Seal* of Mr. Pennant, which in the first or folio edition of the *British Zoology*, was not considered as distinct from the common Seal.

I shall not pursue the description of this genus further, than to observe that it is of considerable extent, and that several species inhabiting the Asiatic and American seas are of vast size, and



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ARCTIC WALRUS.

in Tabl. London Publish'd by G. Kearsley Fleet Street.

Taylor sculp.

in their œconomy or mode of life exhibit many curious particularities, for the description of which I must refer to the last edition of Mr. Pennant's History of Quadrupeds, where a full description of their manners will be found, extracted from the works of Steller and other travellers of high authority.

I proceed to the next genus, which is entitled *Trichechus* or *Walruss*. It is characterized by the want of fore-teeth, and by a very large tusk on each side, pointing downwards: the grinders are obtuse, with wrinkled or irregular surfaces at the top. The feet resemble those of the genus *Phoca* in structure, but the hind-feet are placed still more backward, and even coalesce or unite into the appearance of a single fin in some species. The principal species in the *Trichechus Rosmarus* of Linnæus, or the Northern Walruss, an animal of vast size, having been often seen of the length of eighteen feet. Its shape resembles that of a Seal, but it is of a thicker or less elegant aspect; its colour is a dark brown; the skin being thick, and scattered over with short dusky hair: the head is small, and rounded, the upper lip very large, divided in the middle, and beset with numerous

bristles of the length of three or four inches, and of the thickness and colour of wheat straw; the tusks are of great length, measuring from eighteen inches to two feet or more. The Walruss is of a gregarious nature, often assembling in vast numbers on the masses of floating ice so often seen in the northern seas; where they produce their young in the spring season, and have generally but one at a birth. In their manners they resemble the genus *Phoca*, but feed principally on sea-plants and shell-animals rather than on fishes. The Walruss is naturally a harmless animal, unless attacked, when it becomes extremely vindictive; roaring in a dreadful manner, and with its long tusks grappling with and endeavouring to upset the boats of those who attack it. It is an animal which has long ago been pretty well represented in the works of some of the earlier zoologists, but it is observed by Mr. Pennant, that the best representation is given in the fifty-second plate of the last voyage of Captain Cook. There appear, however, to be distinct races or varieties of the Walruss, those seen in the icy regions of the American seas, and represented in the above plate, having longer and sharper tusks in pro-

portion than those observed in the northern seas of Europe, in which also the tusks are observed to diverge, not to converge, as in the American variety.

Another species is the *T. borealis*, or Whale-tailed Walruss, the feet of which very nearly resemble those of Whales, exhibiting no distinct appearance of the toes or claws. It grows to a still longer size than the common Walruss, sometimes measuring eight-and-twenty feet in length, and is an inhabitant of the Asiatic and American seas.

A third species is the *T. Manatus*, or the Manati, found in the Indian and American rivers, and of which a curious anecdote is told by the early historians of America, who relate that at the first arrival of the Spaniards, a tame Manati was kept by a Prince of Hispaniola, in a lake adjoining to his residence; and which, when called by its name, would readily appear and suffer itself to be caressed by its protectors. It would occasionally offer itself to its Indian favorites, and carry them over the lake, to the number of ten at a time, singing and playing on its back. At length, in consequence of a violent inundation, it was

carried back to its native waters, and never more appeared.

It is well known that the common Seal or *Phoca vitulina*, may also be readily tamed.

Lastly the *round-tailed Manati*, a species allied to the former, but smaller, is a native of the larger African rivers; it grows to the length of fourteen feet, and is of a dark colour, with hair somewhat resembling that of the Seals, and a flat rounded fin at the extremity of the body, formed by the juncture of the webs of the hind-feet: the fore-feet are each furnished with flat and rounded nails. A specimen of this animal exists in the Leverian Museum.

CETACEA.

HAVING taken a slight survey of the pinnated or web-footed quadrupeds, we are led by a kind of natural transition to the *Cetaceous Mammalia* or Whales. These cannot in strict propriety be called Quadrupeds, since they are in reality furnished with only two feet, which have the appearance of

thick fins, while the tail, which is divided into two horizontal lobes, is merely muscular and tendinous, being void of any bones analogous to the feet in the rest of the Mammalia; those bones being only to be found in the fins or fore-feet.

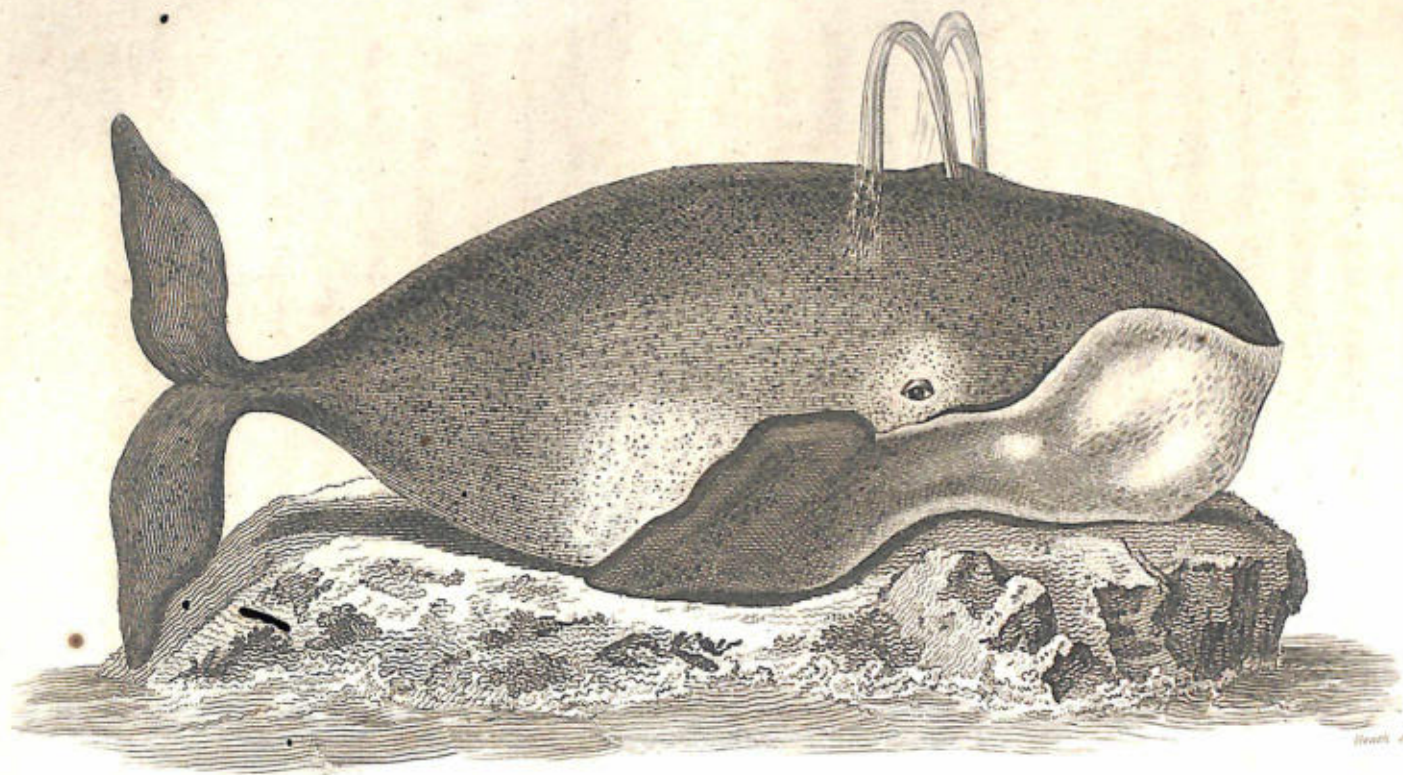
The general appearance of the Cetaceous Mammalia or Whales so much resembles that of a fish, that it is very natural for any one to suppose that they should be classed among that tribe of animals, and not with the rest of the Mammalia; and indeed so far has this compliance with popular custom been followed, that most naturalists, till the institution of the Linnæan System, gave them the appellation of Fishes. Thus, exclusive of the more early writers, the celebrated Ray and Willoughby considered them in this view, and commenced their History of Fishes with that of Whales. Nay even Linnæus himself, in his well-known work the Fauna Suecica, as well as in some of the earlier editions of the Systema Naturæ, arranged them under the class of Fishes. But, since their whole interior structure agrees with that of the Mammalia; since they have lungs and breathe, since they have warm blood, and a heart resembling in conformation that of Qua-

drupeds, and in particular, since they produce and nourish their young in the same manner, it follows very clearly that they can with propriety be ranked in no other class of animals than the Linnæan Mammalia.

In a general view, exclusive of their Fish-like form, the Whales are distinguished by a particularity not to be found in any of the rest of the aquatic Mammalia. This is a double opening or spout-hole, on the top of the front of the head, through which they discharge at intervals, with great violence, and to a great height, the water which they have taken in at the mouth.

Though the Whales, all together, constitute a pretty numerous tribe, yet the genera, or particular divisions into which they have been distributed are but few. Linnæus institutes for the whole tribe only four distinct genera, viz. *Balæna*, *Physeter*, *Monodon*, and *Delphinus*.

The first of these genera, or that of *BALÆNA*, is distinguished by the total want of teeth; instead of which the mouth is furnished, but in the upper jaw only, with a vast number of very long and broad, horny, flexible plates, disposed in regular rows along each side. These are popularly known



GREAT MYSTICETE.

by the name of Whalebone: each plate is deeply fringed or subdivided at its lower edge into long and slender bristles, by which means the edges of the under jaw are secure from being wounded by it, and at the same time the junction of many rows of bristled or subdivided edges operates as a strainer, when the mouth, after receiving food, suddenly closes, thus retaining the prey, and permitting the superfluous water to escape. The principal species of the genus *Balæna* is the *B. Mysticetus* or great Whalebone Whale, *Mysticet*, or common Northern Whale. It is on all hands allowed to be the largest of all animals yet distinctly known. Before the Northern Whale-Fisheries had reduced the number of this species, it was no uncommon circumstance to find specimens of an hundred, an hundred and twenty, or even, according to some, an hundred and fifty feet in length. Such however are now very rarely, if ever seen, and it is not often that they are found of more than sixty or seventy feet in length. In its general appearance the animal is peculiarly uncouth; the head constituting nearly a third of the whole mass: the mouth is of prodigious width, the tongue measuring eighteen or twenty feet in

length: the eyes most disproportionably small; scarce exceeding in size the eyes of an Ox. The common colour of this species is black above, and white beneath; but in this it is known to vary: the skin, as in all the rest of the Whale tribe, is perfectly smooth, soft, and glossy, and is entirely bare, or destitute of any appearance of hair. The general residence of the animal is in the Northern seas; its food is supposed to consist chiefly of different kinds of small, gelatinous marine animals, particularly of the smaller Medusæ or Sea-Blubbers, and Sea-Snails of the genus called Clio. The throat in this Whale is observed to be very narrow, so that it only preys on the smaller sea-animals in general.

With respect to the anatomy of the Whale, I shall content myself with observing, that on so colossal a scale of magnitude does nature act in these animals, that the vertebræ or joints of the back-bone are of the size of moderate barrels; the ribs and jaw-bones so large as to be occasionally used to form the sides of tall, arched gateways; the heart too large to be contained in a very wide tub; the aorta or principal artery measures about a foot in diameter, and it is computed

that the quantity of blood thrown into it at every pulsation of the heart, is not less than from ten to fifteen gallons.

The strength of the great Northern Whale is prodigious; it is able to shatter a strong canoe in pieces with a single stroke of its tail: it swims, according to the computation of Cedepe, at the rate of about thirty-three feet in a second, and it is further computed that in the space of about forty-seven days, it might circumnavigate the globe in the direction of the equator, even allowing it to rest by night during the whole time. It is supposed to be an extremely long-lived animal. The female produces, in general, but one young at a birth, which usually measures something more than twenty feet in length; and she has the reputation of being very tenderly attached to her offspring*.

The least of all the Whalebone-Whales or Lin-

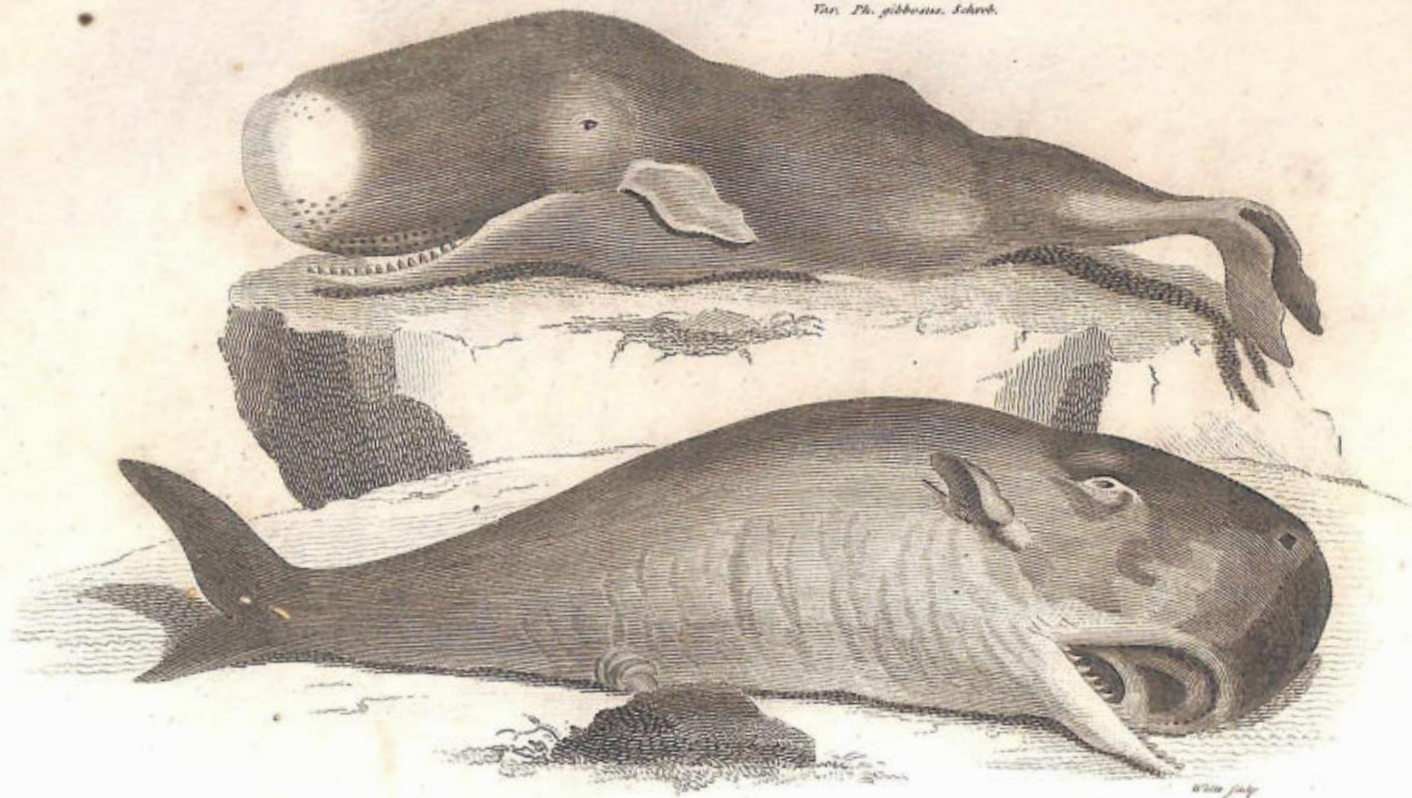
* *B. Glacialis* or Nord-Caper is a very large species of Whale, but thinner in proportion than the Mysticete: it is an extremely voracious animal; preying on many kinds of fish, and in particular on Cod and Herring. In the stomach of this Whale have been observed three hundred Cod: and in the stomach of a second individual were found more than a tun of herrings.

næan Balænæ is the *B. rostrata*, rostrated or taper-snouted Whale. It seldom reaches to the length of twenty feet, and is of an elegant shape, its colour is blueish-black above, and white beneath, and the skin, from the throat to the middle of the body beneath, is marked in a longitudinal direction by very numerous, deep furrows, the insides of which are of a red colour: this furrowed structure of the skin beneath the fore-parts of the body, appears to be a wonderful institution of Nature for enabling the animal to increase at pleasure its diameter, and render itself specifically lighter; by inflating a vast cavity situated beneath the breast and communicating with the throat: during this action the furrowed skin becomes extended laterally, and the insides of the furrows being thus laid open, give the appearance of so many beautiful red stripes, along the sides and beneath the body. This curious structure, which, perhaps, was first distinctly described by the late Mr. Hunter, is not peculiar to the present species, but exists in some others. The Rostrated Whale is a native of the Northern seas, and has occasionally been taken on our own coasts.

The genus *PHYSETER*, containing what are

Fal. Ph. gibbosus, Schreb.

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BLUNT-HEADED CACHALOT.

Engraved by J. G. Smith, Fleet Street London.

called Sperma-Ceti Whales, is distinguished by having visible teeth in the lower jaw only, which when the mouth is closed, are received into so many open sockets in the upper jaw: an accurate inspection of the upper jaw however proves that there are corresponding teeth in that also, but they are very small, and situated so deep within the sockets as to be totally invisible on a general view.

The *Physeter Macrocephalus*, or great Spermaceti Whale, is not greatly inferior in size to the Great Whalebone Whale or Mysticete, and is of a shape not less uncouth; the head being of so vast a size as at least to equal a third of the length of the whole animal. It is from this Whale, as well as from some others of this genus, that the well-known substance popularly known by the name of Spermaceti is obtained. This substance, which in the living animal is a liquid oil, is contained in a vast cellular cavity within the head; when exposed to the effect of cold air, it concretes into a solid form: it exists in other parts of the animal, as well as in the head, and may be gained from the blubber or common oil by proper preparation: in a smaller proportion also it is found to exist in

the blubber of all the rest of the Whale tribe, and even in the oil of the generality of marine animals.

Another remarkable production of this and other species of the *Physeter* tribe, is known by the name of Ambergris, and has long continued its reputation as an agreeable perfume. Ambergris is an opaque whitish, greyish, or yellowish substance, so light as to swim, not only in water, but even in spirit of wine. Its real origin was formerly much disputed, but it is now ascertained to be a product from the Whales of this tribe, and it will perhaps excite some surprise in those who may not be informed of its real nature, to be told that it is no other than part of the natural contents of the animals' intestines, hardened by the effect of some disease, into a compact or unusually solid state. An idea has been entertained, and perhaps it is not an improbable one, that Ambergris owes its odour to the flesh of a particular species of Cuttle Fish, which has naturally a musky smell, and on which these Whales are known particularly to feed.* In the larger pieces

* *Sepia moschata*. Bosc. Sonnini's Buffon. Mollusque. tom. 3. p. 60. pl. 34.

of Ambergris, the horny beaks of these Cuttle-Fish are generally found imbedded.

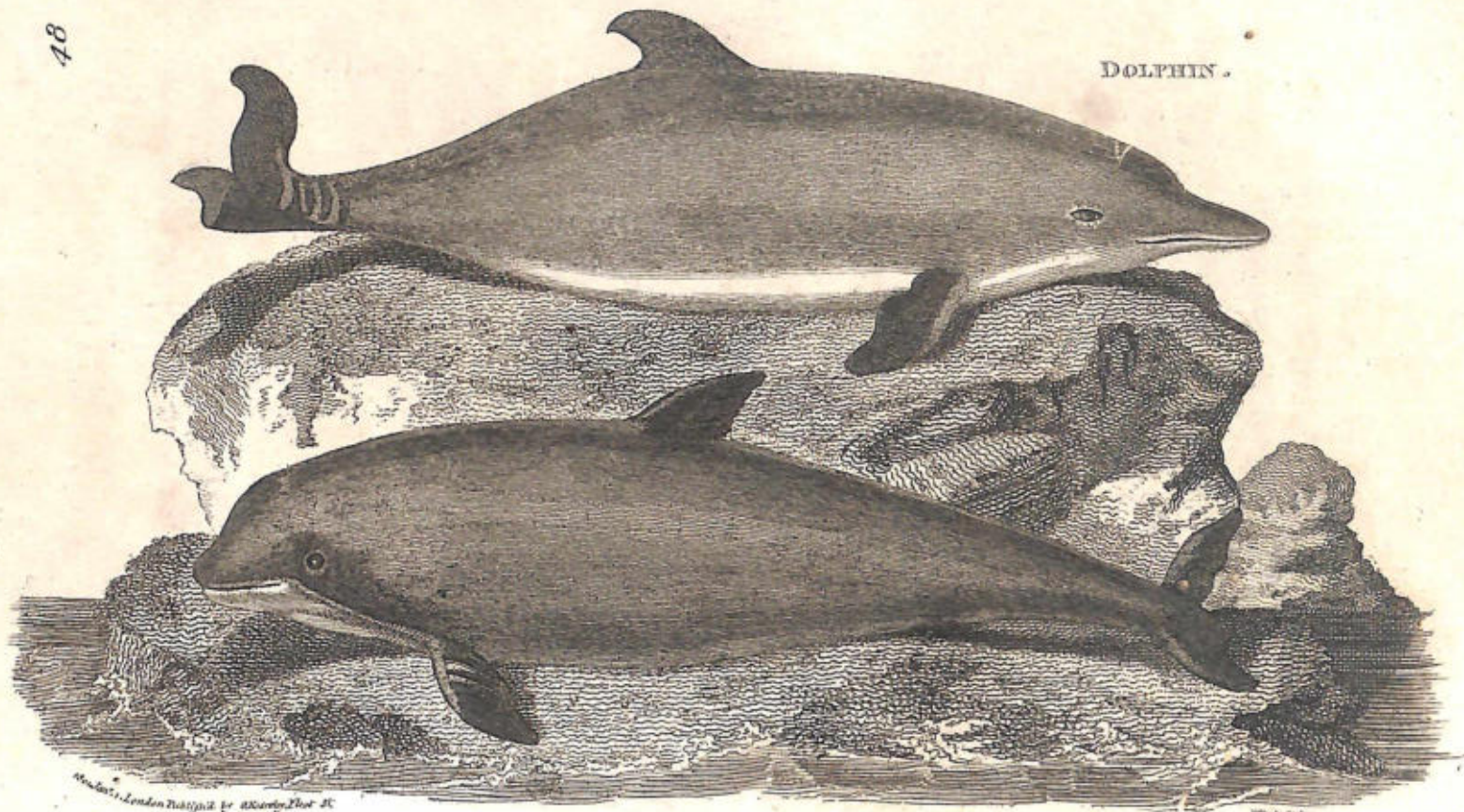
The genus *Delphinus* or Dolphin is characterized by having numerous teeth in both jaws. These animals constitute the smallest of the Whale tribe; the common Dolphin rarely exceeding the length of eight or ten feet. Its shape is lengthened or fish-form, with a plump or thick body, slightly sharpened snout, and a thick pointed fin towards the middle of the back. Its colour, like most others of the tribe, is dark blueish or brownish-black above, and white beneath: this animal was well known to the ancients, who celebrated it for a supposed affection to the human race, and regarded its appearance at sea as a prosperous omen. Modern seamen are of a different opinion, and consider its appearance rather as a prelude to an approaching storm. The Dolphin swims very swiftly, and preys on various kinds of fish; and it is observed by the accurate *Otto Fabricius*, in his work entitled *Fauna Greenlandica*, that in swimming it constantly assumes a curved posture, depressing very considerably both head and tail during that action; and thus justifying in some degree the observations of the ancients, who ap-

pear indeed to have been guilty of some aggravation in this respect in their poetical and sculptorial representations, while the moderns, on the contrary, have been somewhat too severe in condemning them.

The Porpoise or *D. Phocæna*, is a still more common species than the Dolphin, and so extremely similar to it, that there can be little doubt of its having been often confounded with it: it is however a smaller animal, and rarely exceeds the length of six or seven feet: its chief mark of distinction from the Dolphin seems to consist in having a shorter and blunter snout. The Porpoise, being the most common European species of all the Cetaceous tribe, has, of course, been more accurately inspected, as to its anatomical structure, than any of the rest; Rondeletius, Ray, Tyson, and others, having given a good general anatomy of the animal. It is also a curious fact, (such is the revolution of taste), that the Porpoise was a few centuries ago considered as a splendid and elegant dish at royal and noble tables; and this in England even so late as the reign of Queen Elizabeth.

By far the largest of the Dolphin genus is the species called the *Grampus*, the *D. Orca* of Lin-

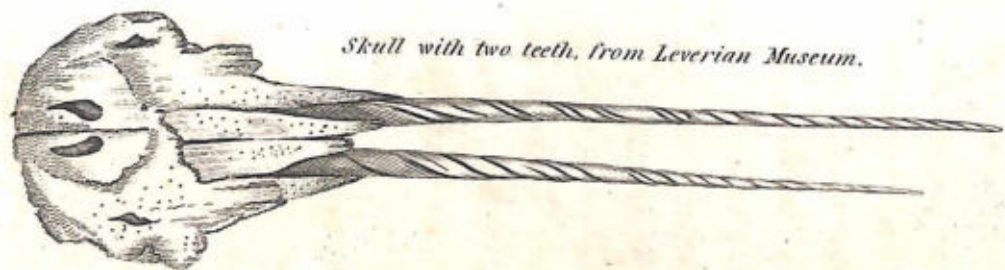
DOLPHIN.



London: Printed by G. G. & J. S. for A. S. 1804.

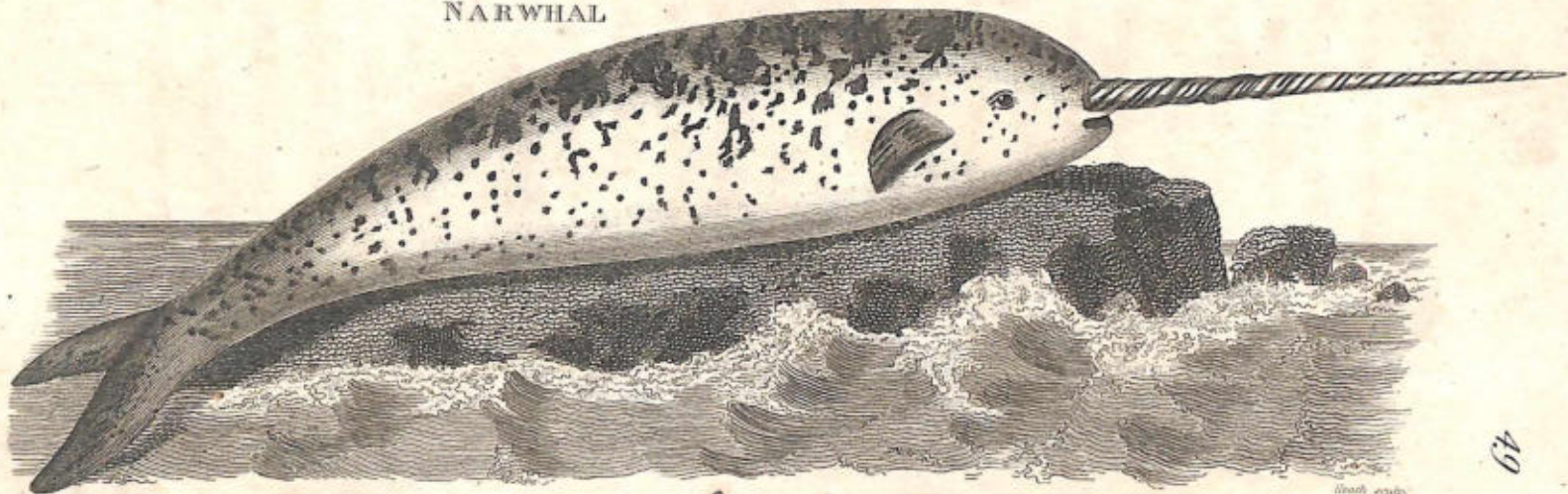
W. H. Sculp.

PORPESSE.



Skull with two teeth, from Leverian Museum.

NARWHAL



Smith sculp.

næus. It arrives at the length of five-and-twenty feet, and is of an extremely fierce and voracious nature, feeding on the larger fishes, and even, occasionally, on the Dolphin and Porpoise themselves. It is found in the Mediterranean and Atlantic, as well as in the polar regions, and is one of the most ferocious inhabitants of the ocean. As a species it is chiefly distinguished by having the snout turned a little upwards. I cannot but here observe that the Linnæan character of this species may mislead, since it is said to be furnished *dentibus serratis*, with *serrated* or sawed teeth, a particularity not found in any of the Whale tribe, which have all simple or plain, conical teeth: but the meaning of the words *dentibus serratis* here is only to be understood in the common classical sense, as in Pliny and other authors; meaning so disposed as to give the outline of the jaw a serrated appearance in profile.

There remains one more Linnæan genus of the Whale tribe, and that one of the most remarkable: this is the genus *Monodon* or Narwhal. It is distinguished by an extremely large and long, spirally twisted tooth, projecting in a straight direction, from the upper jaw. Sometimes there are

two of these teeth, parallel to each other, in which case one is always observed to be somewhat shorter and thinner than the other. Supposing the natural number to be two, as stated by Linnæus, in his generic character, I need not observe, that the name of *Monodon* would be peculiarly absurd. In fact the natural number is two, but one is always observed to predominate, and the probability is that they are so constituted as alternately to supply the defect occasioned by casting, on one side.

The *common Narwhal* or *M. Monoceros* of Linnæus, sometimes called the Sea Unicorn, is an inhabitant of the northern seas, where it grows to the length of more than twenty feet, exclusive of the tooth, which is about half the length of the body. The colour of the animal is an irregular variegation of black and white on the upper parts, and white beneath; and the young are said to be of a much darker colour than the full-grown animal. The food of the Narwhal, like that of the great Whalebone Whale, consists chiefly of Sea-blubbers or *Medusæ* and other small animals, but it is also known to prey occasionally on fishes, and particularly on flat-fish. Before this animal became very distinctly known to the

naturalists of Europe, the teeth, or spiral horn-like processes, were held in very high estimation, as the supposed horns of Unicorns. Various medical virtues were attributed to them, and they were even numbered among the articles of regal magnificence. At Rosenberg in Denmark is said to be still preserved an ancient throne, composed of Narwhals' teeth, and which was once the seat of state of the ancient Danish Monarchs.

I purposely omit speaking of the supposed different species of this genus; their description, as yet, being not sufficiently accurate to justify any very clear conclusions.

Having thus taken a general view of the Mammalia or viviparous quadrupeds, we shall in our next Lecture proceed to Birds.

LECTURE V.

WE are now entering upon a beautiful and extensive branch of Natural History, called *Ornithology* or the History of Birds. These animals far exceeding Quadrupeds in point of number, it was highly necessary that they should be distributed into orders, and genera, in order to facilitate the knowledge of the species. In this part of Zoology, as in Quadrupeds, we shall pursue the Linnæan arrangement, with some variations and transpositions.

I know not whether it may be thought necessary to be very particular in the description of a bird, as distinguished from a quadruped, but as there are some circumstances which are important in the comparative anatomy of these animals, it may not be improper to give a slight general description of them.

The skeleton or bony frame of the animal is in general of a lighter nature than in quadrupeds, and is calculated for the power of flight: the spine is immoveable, but the neck lengthened and flexible: the breast-bone very large, with a prominent keel down the middle, and formed for the attachment of very strong muscles: the bones of the wings are analogous to those of the fore-legs in quadrupeds, but the termination is in three joints or fingers only, of which the exterior one is very short. What are commonly called the legs are analogous to the hind-legs in quadrupeds, and they terminate, in general, in four toes, three of which are commonly directed forwards, and one backwards; but in some birds there are only two toes, in some only three. All the bones in birds are much lighter or with a larger cavity than in Quadrupeds.

With respect to the definition of a Bird, as absolutely distinguished from all other animals, it would be sufficient to say, according to the old mode, that a bird is a two-footed, feathered animal. The power of flight need not enter into the definition; for there are many birds which are perfectly destitute of the power of flight; as the Ostrich,



SKELETON of TURKEY

1808 Oct. London. Published by C. Kearsey Fleet Street.

the Cassowary, all the Penguins, and some other birds. The feathers with which birds are covered are analogous in their nature to the hair of Quadrupeds, being composed of a similar substance appearing in a dissimilar form. Beneath or under the common feathers or general plumage, the skin in birds is immediately covered with a much finer or softer feathery substance called down. The external or common feathers are called by different names on different parts of the animal. The longest of the wing-feathers, which are generally ten in number, in each wing, are called the first or great quills, (in the Linnæan phrase *remiges primores*, as being the chief oars or guides as it were.) The feathers constituting the middle part of the wing are called the secondaries or second quills (*remiges secundarii* of Linnæus,) and are more numerous than the first: the feathers descending along each side the back are called the scapular feathers: the small feathers covering the shoulders are called the smaller wing-coverts, (*tectrices minores*;) the next series to these are called the larger wing-coverts, (*tectrices secundariæ* or *majores*;) and at the edge of the shoulder are a few rather strong and slightly

lengthened feathers, constituting what is called the false or spurious wing; the alula or alulet of some ornithologists. The tail, in most birds, consists of twelve feathers; in some of ten only; and in some others of eighteen, twenty, or twenty-four. Sometimes on each side the tail or above it, at the lower part of the back, are placed several very long feathers of a different structure from the rest: these have been called the hypochondriac and unpygial feathers. These are the principal distributions of the feathers on a bird. With respect to the particular shape of the feathers themselves, they vary greatly in the different tribes.

The particulars most important in the comparative anatomy of birds are these. The throat, after passing down to a certain distance, dilates itself into a large membranaceous bag, answering to the stomach in quadrupeds: it is called the crop, and its great use is to soften the food taken into it, in order to prepare it for passing into another stronger receptacle called the gizzard: this which may be considered as a more powerful stomach than the former consists of two very strong muscles, lined and covered with a stout

tendinous coat, and furrowed on the inside*. In this receptacle the food is completely ground and reduced to a pulp. The lungs of Birds differ from those of quadrupeds in not being loose or free in the breast, but fixed to the bones all the way down: they consist of a pair of large spongy bodies, covered with a membrane which is pierced in several places, and communicates with several large vesicles or air-bags dispersed about the cavities of the body.

The eyes of birds are more or less convex in the different tribes; and in general, it may be observed that the sense of sight is more acute in birds than in most other animals; and they seem to possess a greater degree of power in accommodating the convexity of the eye to any particular distance than other animals, for which purpose they are provided with a curious apparatus of scales round the iris or coloured part of the eye not be observed in quadrupeds. Birds have no outward Ear, but the internal is formed on the same general plan as in quadrupeds.

Birds as every one knows are oviparous animals, always producing Eggs, from which the

* In the predaceous birds or Accipitres this is wanting, the stomach being allied to that of quadrupeds.

young are afterwards excluded. The process of the young in the Egg, from the time of its first production to that of the complete formation of the bird, is extremely curious and interesting, and may be found detailed with sufficient exactness in the works of Malpighi, Buffon, Monro, and many others. I shall only observe on this subject that the first appearance of the young, as an organized body, begins to be visible in six hours after the egg has been placed in a proper degree of heat under the parent animal*.

The number of eggs is extremely various in the different tribes of birds.

Birds are divided by Linnæus into six *Orders* or Assortments, viz. 1. *Accipitres* or Predacious Birds, such as Vultures, Eagles, Hawks, Owls, and some others.

* A particular highly worthy of attention is, that the chick, or young bird, when arrived at its full size, and ready for hatching, is by nature provided with a small, hard, and calcareous protuberance at the point or tip of the bill, by which it is enabled the more readily to break the shell, and which falls off some hours after its hatching. So careful has Nature been, and so accurately has every circumstance attending the process been foreseen and provided for!

2. *Picæ* or Pies, containing all the birds of the Crow and Jay kind, the Parrots, the Woodpeckers, the Kingfishers, and a great variety of other birds.

3. *Passeres* or Passerine birds, comprising the Pigeons, the Thrushes, the Larks, and all the Finches or small-birds in general, either with thick or slender bills.

4. *Gallinæ* or Gallinaceous birds, or such as are more or less allied to the common domestic Fowl, and consequently containing the Pheasant and Partridge tribe, the Peacock, Turkey, and a variety of other birds.

5. *Grallæ* or Waders, consisting of all the Heron tribe, the Curlews, the Plovers, and other numerous tribes which have lengthened legs and chiefly frequent watery situations.

6. The *Anseres* or Web-footed birds, as the Swan, Goose, or Duck tribe, the Gulls, the Penguins and many others.

Out of these six *Linneæan* Orders some ornithologists have instituted a few others, in order to give a greater degree of clearness and precision to the arrangement of birds, but they cannot be considered as absolutely necessary.

Thus the Pigeons have been sometimes considered as properly forming a distinct order of birds under the title of the *Columba* or the Columbine Order, instead of being ranked among the Passeres of Linnæus; and the Ostrich, Cassowary, and Dodo have been supposed to constitute an order called the *Struthious* Order, instead of ranking either among the Grallæ or Gallinæ of Linnæus.

The first Linnæan tribe of Birds, called ACCIPITRES, consists of the *Vultures*, the *Eagles*, the *Owls*, and the *Shrikes* or Butcher-Birds; for all these birds are of a predacious nature, and feed entirely on animal food. Their general characters, considered at large, or as belonging to the whole tribe, are these. The bill is more or less curved, strong, and often covered, round the base, by a naked membrane, called a cere; and on each side, towards the tip, is a pretty strong point or projection, forming a kind of tooth, and serving the more easily to tear the prey. The wings are large and strong, and the whole body stout and muscular; the legs strong and short, the claws much curved, and sharp-pointed.

These birds generally make a somewhat negligently or slightly-formed nest, in lofty situa-

tions, and lay from two to four eggs. The female in the predacious birds is always larger than the male; and the whole tribe, according to Linnæus, may be considered as analogous to the Order *Feræ* among quadrupeds.

Of the predacious tribe the first genus or set is that of *Vultur*. Its chief character is, a beak of a somewhat lengthened form, running strait to some distance, but curving strongly at the tip: it has no cere or naked membrane at the base: the head and neck, in most species, are bare of feathers, being covered only with a kind of down. The species of Vultures are considerably numerous, and they inhabit almost all the warmer parts of the globe, but are not so often seen in the Northern regions, where their presence would be less necessary. They are observed to prey on dead animals in preference to living ones, and as they are always on the watch for those, and prefer such as are in a putrid state, they may be considered as the Scavengers of Nature in the animal world, and are of extreme utility in the hotter regions, by quickly removing all such animal remains as would otherwise tend to infect the air.

The largest, and most extraordinary of all the Vultures is the South-American species called the *Condor*, so long celebrated as the largest of all birds possessing the power of flight, and till lately, so very indistinctly described in the works of naturalists. It does not appear that a specimen of the Condor was ever seen in Europe till about twelve or fifteen years ago, when a female bird was brought over in a dried state by Captain Middleton, and deposited in the Leverian Museum. About two years afterwards a male, in the most perfect preservation, was obtained, and placed in the same collection. It is this latter specimen that has afforded the opportunity of giving a true description of the species, which is distinguished by being of a black colour, with the shorter or secondary wing-feathers white; the head furnished with an upright, compressed, fleshy crest or comb, the throat, to a considerable distance down the breast, naked and red, and the neck furnished, down each side, with several short, circular wattles or flaps: round the upper part of the neck, where it joins the back, is a kind of ruff or tippet of milk-white, downy feathers: the wings are of vast extent, and when



CONDOR

the bird was fresh killed, are said to have measured nearly fourteen feet from tip to tip. This specimen affords an opportunity of rectifying an important error in the description of the Condor given by general observers, who have seen it in its native regions, but probably at a distance, and with its wings closed; for such descriptions tell us that the back of the bird is milk-white, which is not the case, but the mistake may be supposed to have arisen from the white wing-feathers folding over the back when the wings are closed. In such descriptions also, the tail is said to be small, whereas, on the contrary, it is large in proportion to the bird. The accounts of the Condor, by some of the earlier historians of the Western Continent are singularly curious, and such as the more sober philosophic faith of European Naturalists could hardly be supposed to admit. These writers assure us that the Vulture called the Condor is capable of snatching up, and carrying off boys of upwards of ten years of age; that a pair of these destroyers in concert, will attack a heifer in the midst of a field, and tear it in pieces with the utmost ease. In short, the descriptions of

the Condor bring to our mind the imaginary bird called the *Roc* or *Ruck*, which makes so conspicuous a figure in the Arabian Tales.

The most common European Vulture is the *V. castaneus*, or great brown Vulture: it is of a dusky chesnut-brown colour, with a naked head and neck; the long wing-feathers black, and the base of the neck surrounded by a ruff of short whitish feathers. This is the Vulture so often seen in the usual exhibitions of animals. It is found in the South of Europe, and in many parts of Africa.

The next genus of the Accipitres is called *Falco*, and contains all the Eagles, Falcons and Hawks. It is a genus so very numerous that on the most moderate computation the species may be supposed to amount to about 120. The largest and most celebrated species is the *Golden Eagle*, or *Falco Chrysaetos* of Linnæus, which is of a reddish brown colour, with dusky shades and variegations, and has the cere or naked membrane round the base of the bill of a deep yellow or gold-colour: and the legs and feet are of similar colour. Its general length is about three feet, and its weight about 12 pounds. It is observed to vary in some degree in its colours. The



GOLDEN EAGLE

Golden Eagle is the Bird of Jupiter of the ancient Greeks and Romans. It is numbered among our native British birds, having been occasionally observed to breed in the northern parts of the island; but in Ireland it is more common: its extent of wings, when fully expanded, is more than seven feet.

The Osprey or *F. Haliætus* of Linnæus is one of the larger or rather middle-sized species of this genus, and is of a brown colour above, white beneath, with the head whitish, and the cere, legs and feet blue. Linnæus, in mentioning this bird, falls into a vulgar error, in supposing that the *left* foot is slightly webbed. The Osprey is a native of Europe, and is found in our own country, chiefly frequenting the sea shores, and the larger lakes, and preying on fish, which it seizes by precipitating itself upon them from a considerable height*. Few of the present genus

* A much larger and finer species, very nearly equalling the Golden Eagle in size, is the *Falco Ossifragus* of Linnæus, which by many naturalists is also called the Sea-Eagle, though very different from the Common Osprey. Its colour is brown with paler variegations, and it is remarkable for the strong curvature of its sharp-pointed claws. Native of England, &c.

have any gayety of colours, but some are possessed of a high degree of elegance, especially some of the smaller kind of *Falcons* and *Hawks*, among which latter may be particularized the *Kestrel*, a well-known British species of a reddish brown colour above, spotted with black; with the head and tail dove-coloured, the latter marked by a black bar. The female is brown, with black variegations, and the tail is brown also, with numerous blackish bars.

The third genus of the *Accipitres* is that of *Strix* or *Owl*. The bill in this genus is hooked, but without cere at the base: the nostrils are covered by reversed bristly plumes, and the head, eyes, and ears are very large. The genus is pretty numerous; and the largest or principal species is nearly equal to a small Eagle in size, and of a rich chesnut-brown colour, elegantly marked and spotted with very numerous blackish variegations of different sizes: the head is distinguished by a large pair of feathered tufts, rising above each ear, and the irides or circles of the eyes are of the finest golden yellow. This bird, generally known by the name of the Eagle-Owl, or Great Horned Owl is not very uncom-



GREAT HORNED OWL

mon in many parts of Europe, and has been sometimes found in England. In North America is a species much allied to it, but differing in having the under parts ash-coloured and marked by very numerous transverse brown lines or bars. The common Brown Owl, and the common Barn Owl must be supposed to be known to every one. Owls in general are calculated for seeing to the greatest advantage in a sober light, for which reason they shun the glare of day, and pursue their prey by night; and, as an eminent writer somewhat oddly expresses himself, they see ill because they see too well; their eyes being sensible to the smallest or weakest impressions of light. Yet some species have been observed to prey, like Hawks, during the day-time; and it is remarkable that such species are in some degree allied to Hawks in shape; having a slender or lengthened body and a longer tail than the rest of their tribe. The bird called the Caparacoch or Hawk-Owl of North America is of this kind, and is well figured in the ornithological work of Edwards. Some of this genus are remarkable for their small size; as a Siberian species, called by Dr. Pallas

Strix deminuta, which is hardly superior to a sparrow in size, and of an elegant grey colour, freckled with very numerous dark-brown or blackish specks.

Ornithologists differ in some degree about the next or fourth Linnæan genus of the Accipitres or predacious Birds; some thinking that it should rather be placed among the Picæ or Pies. Its habits however are strictly those of Birds of prey. This genus is called *Lanius*, in English *Shrike* or *Butcher-Bird*, which name is given to it on account of its singular practice of separating the limbs of such birds and other animals as it kills, and fastening them on thorns, by regularly transfixing each: this practice is not only common to the several European species, but is observed in those of Africa and America. The Great or Common English Shrike or Butcher-Bird is the *Lanius Excubitor* of Linnæus, and chiefly seen in the northern parts of the kingdom. It is about the size of a Thrush and of a grey colour, with black wings and tail, and a black streak across each eye: the bill and legs are also black. Some of the exotic species of this genus are of very brilliant colours.

The Order PICÆ or PIES, at which we now arrive, is so very numerous, that, far from passing through all the genera of which it is composed, we shall only select a few as examples. The Order *Picæ* may be considered as analogous to that of *Primates* among Quadrupeds. The bill varies in structure in the different genera, but is commonly of a slightly compressed and convex form: they build their nests or deposit their eggs in trees, and their food is principally of a vegetable nature, though some genera feed on insects.

I shall now proceed to select some examples of the genera belonging to this numerous order. The genus *Buceros* is one of the most singular: it consists of birds of rather large size, and distinguished by the excessive size of their beaks, which are often still farther remarkable for some kind of large prominence on the upper mandible. The most conspicuous species is the *Buceros Rhinoceros* of Linnæus, commonly called the *Rhinoceros-Bird*: its general size is that of a Turkey, but with a much more slender body in proportion. Its colour is black, with the tail white, crossed by a black bar: the beak is of

enormous size, of a lengthened, slightly curved, and pointed shape, and on the upper mandible, towards the base, is an extremely large process, equal in thickness to the bill itself, and turning upwards and backwards in the form of a thick, sharp-pointed horn. The use of this strange process is by some supposed to be that of enabling the bird the more easily to tear out the entrails of its prey; but others affirm that it is not of a predacious nature, feeding only on vegetable substances. This bird is principally found in the East-Indian islands. In the Leverian Museum is a remarkably fine specimen.

But the genus *Ramphastos* or Toucan exhibits a still greater degree of disproportion between the size of the bill and that of the bird; for the Toucans in general are not larger than Magpies; but are provided with bills of so inordinate a size as, in some species, almost to equal that of the whole body: the bill in this genus however, notwithstanding its size, is of a very slight substance, having a very large internal cavity, and the exterior sides, in the living bird, are so slight that they may be impressed by the fingers, and afterwards restore themselves



TOCO



RHINOCEROS BIRD

by their own elasticity. The tongue in the Toucans so much resembles a long slender feather, that the first describers considered it as really such: it is of a horny substance, and divided at the edges into innumerable notches or barbs. The Toucans are all natives of South America, and feed on the softer kind of fruits. One of the most remarkable species is the *Toco*, the *Ramphastos Toco* of Linnæus, a bird about the size of a Pigeon, black above and white beneath; with a bill measuring more than seven inches in length, and of a reddish-yellow colour with a black tip.

The Toucans are not very numerous, and are in general of very gay colours; the under parts being commonly either red or bright yellow, or varied with both these colours; while the prevailing colour of the upper parts is a greenish black. The bills are, in some species, not less brilliant, being richly marked and shaded with red, green, or yellow, generally in the form of long and broad stripes or bands on each side.

The genus *Psittacus* or Parrot needs very little description, since every one knows the usual

shape of a Parrot's bill, and that the feet are formed for climbing, or are, in the Linnæan phrase, *scansorial*, that is, with two of the toes forwards, and two backwards. Every one however may *not* have observed that in a Parrot's bill the upper mandible is moveable as well as the lower; a very rare particularity in animals; and that the tongue, in most species, is thick and fleshy: in some however, and particularly in some which are natives of New Holland, the tongue is tipped by a fringe of white cartilaginous fibres.

So very numerous is this splendid genus, that the species already described in the works of authors amount to more than 170, and new ones are frequently added to the list, particularly from the regions of Australasia or New Holland, and from the Indian islands. The whole genus, for the convenience of investigation, is divided into the long and short-tailed kinds: the long-tailed kinds are remarkable for having the two middle feathers of the tail longest, the rest shortening gradually on each side, so that the shape of the tail is more or less lanced or sharpened in the different species. On the contrary, in the short-



GREAT SCARLET MACCAW

tailed Parrots the feathers of the tail are of equal length, and the end or tip is nearly even or slightly rounded. The larger kind of long-tailed Parrots are called *Maccaws*; the smaller *Parakeets*. The English term Parrot, in common language being usually confined to the short or even-tailed kinds. Of the large long-tailed Parrots or *Maccaws* the most conspicuous is the *Psittacus Macao* of Linnæus, or *Great Scarlet Maccaw*, which indeed may be well considered as one of the most magnificent of the whole feathered tribe. As a species, it is distinguished by having the body scarlet, the wings blue, with a bar of yellow, and the cheeks bare, white, and slightly wrinkled. In colours it sometimes varies a little in different individuals. Like the rest of the great *Maccaws*, it is a native of South-America.

The best figure extant is that of Edwards, which, in the true expression of character, as well as of colours, far surpasses that given in the Planches Enluminées of Daubenton. In its native regions this bird is often seen in large flocks, which, from the brilliancy of their colours, when seen at a distance, exhibit the appearance of a kind of flying rainbow. An appearance

of this kind is described in Anson's voyage, of the description of the beautiful isle of *Tinian*.

The *Psittacus Ararauna* or Blue and Yellow Maccaw is of similar size and shape, but is entirely of a fine blue colour above, and gold-yellow beneath.

Psittacus Augustus or *hyacinthinus* is of equal size with the two preceding, but is entirely of a fine deep blue, with the bill and feet black, and the orbits of the eyes, and base of the lower mandible surrounded by a bare yellow skin. This very fine species was unknown to Naturalists till it made its appearance in the Leverian Museum. It is supposed to be a native of South-America.

The smaller kind of long-tailed Parrots, or Parrokeets as they are commonly called, are wonderfully numerous. As an example of these I shall mention the *Psittacus Alexandri* or common Ring-Parrakeet, which is a native of India and the Indian islands, and is supposed to have been first made known to the Greeks and Romans by means of the Indian expeditions of Alexander and his Generals. It seems to have been almost the only Parrot distinctly known to the Ancients. It is to this species that Ovid's



PSITTACUS AUGUSTUS

1808 CcL London Published by G. Kearsley Fleet Street.

beautiful Elegy on the death of Corinna's Parrot must be referred.

One of the most elegant of the Parrakeets is a species lately brought in a dried state from New-Holland, and which I have myself lately described under the name of *Psittacus Melanotos* or black-backed Parrakeet. It is a middle-sized species, and remarkable for the vivid contrast of its colours.

Among the short or even-tailed Parrots the common *Grey Parrot* may serve as an example: it is the *Psittacus Erithacus* of Linnæus, and is a very well-known species, generally of the size of a small Pigeon, and of a deep-grey colour with a red tail: it is a native of the inland parts of Africa. The Parrot called the Amazon's Parrot (*P. Æstivus*) is also of this division, and is subject to much variety in point of colour.

The Parrots called Lories belong also in general to the short-tailed division in this genus. As an example we may take the *Psittacus Garrulus* or Scarlet Lory, remarkable for the beauty of its plumage.

Among the numerous genera of the Order *Picæ* one of the principal is the genus *Woodpecker* or *Picus*. It is distinguished by having climbing feet, as in the Parrots, and a strait, strong, pointed bill; while the tongue is wonderfully calculated by Nature for the mode of life to which the animal is destined, being of equal length, when extended, with the body of the bird; but by an admirable apparatus of muscles and tendons, it is either withdrawn into the bill, or thrust out at pleasure, and is tipped with a sharp horny point, serving to seize and transfix the softer kind of insects upon which the birds of this genus feed; as well as to probe or search for them in the cavities of the bark and bodies of trees. The residence of the whole genus *Picus*, which is very numerous, is in the hollows of trees, in which they breed. The most familiar example of the genus is the common Green English Woodpecker or *P. viridis* Lin. frequent in this country, and of a green colour, with the top of the head sprinkled with bright scarlet spots.

The *Picus major* is an elegant British species also, and notwithstanding its name, is of



PICUS PILEATUS

smaller size than the former, and of a black and white colour, with a red bar across the back of the head.

Of the exotic species, the greater number are natives of America; one of the chief is the *Picus principalis* of Linnæus or *White billed Woodpecker*, always distinguished by the ivory whiteness of its bill: the bird itself is one of the largest of its tribe, and is black, with a white stripe down each side of the neck, and a lengthened crimson crest on the head.

Picus pileatus is a North-American species nearly allied to the former, but easily distinguished by its black or deep lead-coloured bill.

The least of the whole genus is the *Picus minimus* of Linnæus, of the size of a Wren, and of a brown colour, with the top of the head red, and the back part black speckled with white: the total length of the bird is three inches and a half: it is a native of South-America.

Among the *Picæ* it would be unpardonable to omit the splendid genus *Paradisea* or *Paradise-Bird*, of which but a very few species were known some years ago, but which is so far increased by the persevering researches of mo-

dern naturalists that the number is pretty considerable. Of these the most common, or that which was earliest known to the Europeans is the *Paradisea apoda* of Linnæus, who did wrong to give it that title, since it still keeps up in some degree the highly absurd idea, that the bird was naturally destitute of feet, the word *apoda* meaning footless, whereas, on the contrary, the legs and feet of the Paradise-Birds are rather remarkably stout and large. The character of the Paradise-Birds is that the bill, which is somewhat lengthened, slightly curved and sharp-pointed, is beset, round the base, with upright velvet or plush-like feathers, and that from each side, beneath the wings, springs, in most species, a certain number of loose-webbed feathers, of a peculiar construction, and greatly exceeding the rest in length. .

The *P. apoda* or common Paradise-Bird is about the size of a Thrush, and of a very fine reddish chesnut-colour on the upper parts, and yellowish-white beneath: the velvet-feathers round the bill are black; the top of the head and the back of the neck yellow, and the throat of the most brilliant golden-green: the tail is of mo-



GREAT or COMMON PARADISE BIRD

derate length; of the same brown colour with the rest of the upper parts, and is shaped as in the generality of birds, and is in a great degree concealed by the long and beautiful assortment of the loosely-webbed floating plumes springing from the sides of the back: these are of the most elegant structure imaginable, and are generally of a bright jonquil yellow at their base, gradually growing pale or whitish as they advance in length; and besides these, there are two very long naked shafts or slender quills in the middle. The long floating feathers are popularly called the tail of the bird, though in reality, as before observed, the tail is of a very different appearance and structure.

This species, or the *Paradisea apoda*, like the rest of the genus, was once supposed to be naturally without feet, and to float almost perpetually in air, never resting, except by the supposed assistance of the two long and slender naked shafts or filaments before mentioned, which the bird was supposed to have the power of occasionally coiling round the branches of trees, and of thus sometimes sleeping. These fables are now sufficiently exploded. The Paradise-birds are said

to live chiefly on the larger kind of Butterflies and Moths. They are the peculiar natives of the Philippine and other Indian islands, and the reason of the old supposition of their wanting legs was owing to these parts having been generally cut off by the natives before they sold the skins to the Europeans. Several of the most elegant species of the genus *Paradisea*, have lately been engraved in a most magnificent manner in a French work on the subject by Audebert and his associates; but it must be confessed that they neither seem to have been copied from capital specimens, nor can they be said to exhibit with sufficient effect the peculiar splendor and elegance so remarkable in the birds of this genus. A highly learned dissertation on the genus *Paradisea* may be found in the additions to Mr. Pennant's *Indian Zoology*, by the late Dr. Reinhold Forster, together with an elaborate and satisfactory disquisition relative to the fabulous *Phoenix* of antiquity, to which these birds have been sometimes supposed to bear a kind of affinity.

The beautiful genus *Alcedo* or Kingfisher has a strait, strong, very sharp pointed beak; with a very short tongue; legs and feet extremely short,



COMMON KINGFISHER

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and the toes so constituted as to form what Linnæus calls a *pes gressorius* or gressorial foot, consisting of three toes forwards and one backwards, but with two of the front-toes joined half way from the base. The genus *Alcedo* or Kingfisher is numerous, and remarkably brilliant in point of colour, the prevailing cast being blue or green, with different degrees of splendor. The only European species is the common Kingfisher, one of the most brilliant of all the European birds. It inhabits the banks of rivulets, where it deposits its eggs. The Kingfisher is supposed to be the *Alcyon* of the Ancients, but the idea of the floating nest, which the ancients attributed to their *Alcyon*, will by no means apply to this bird; though such a circumstance really takes place in a certain genus of aquatic birds of a very different tribe.

The genus *Cuculus* or Cuckow is characterized by its slightly curved bill, climbing feet, and tail composed of ten soft feathers.

It is a numerous genus, differing greatly in size and colours in the different species: the only species inhabiting Europe is the common Cuckow or *Cuculus Canorus* of Linnæus, so well

known by its remarkable note. The common Cuckow is about the size of a turtle-dove, and of a deep blueish grey above, white beneath, with numerous narrow dusky bars: the tail rather long and edged with black and white bars, but the young, or bird of the first year's growth, differs so widely in appearance from the bird in its advanced state, that at first sight, it would hardly be supposed to belong to the same species, being varied with brown, black, and ash-colour, somewhat in the manner of the plumage of a Woodcock. The extraordinary conduct of the Cuckow in usurping the nest of some other bird, of much smaller size than itself, as the Yellowhammer, the Wagtail, or the Hedgesparrow for instance, and depositing its egg in it, leaving it to be hatched, and the young nursed by the care of a stranger, has long excited the wonder of the philosophic world. It is observed that the Cuckow seldom lays more than one egg in the same nest, as if conscious that the space would not be sufficient for the young when hatched. On this subject may be found a highly curious and interesting paper in the 78th vol. of the Phil. Trans. by the celebrated Dr. Jenner, from which



COMMON CUCKOO

it appears that the young Cuckow, on the very first day of its exclusion from the egg, employs itself in throwing out all the young of the bird under which it has been hatched; remaining sole possessor of the nest, and engrossing all the care of the parent bird. Whether any of the numerous species of Exotic Cuckows pursue a plan so much differing from the general institution of Nature, seems as yet unknown.

But, of all the order *Picæ*, none is so remarkable for beauty and singularity as the numerous genus *Trochilus* or Humming-Bird. This brilliant and lively race is peculiar to America, and with few exceptions, to the hottest parts of South America. Their vivacity, swiftness, and singular appearance unite in rendering the Humming-Birds the admiration of mankind; while their colours are so brilliant, that it is not by comparing them with the analogous hues of other birds that we are enabled to describe their appearance, but by the more exalted brilliancy of polished metals and precious stones; the ruby, the topaz, the garnet, the sapphire, the emerald, and polished gold being considered as the most proper objects of elucidation. It is not however

to be imagined that all the race of Humming-Birds are so decorated; some are even obscure in their colours, and instead of the prevailing splendor of the major part of the genus, exhibit only a faint appearance of a golden-green tinge slightly diffused over the brown or purplish-brown colour of the back and wings: neither are all the species very small, for some few exist which measure many inches in length, and may be considered as the giants of this generally diminutive genus.

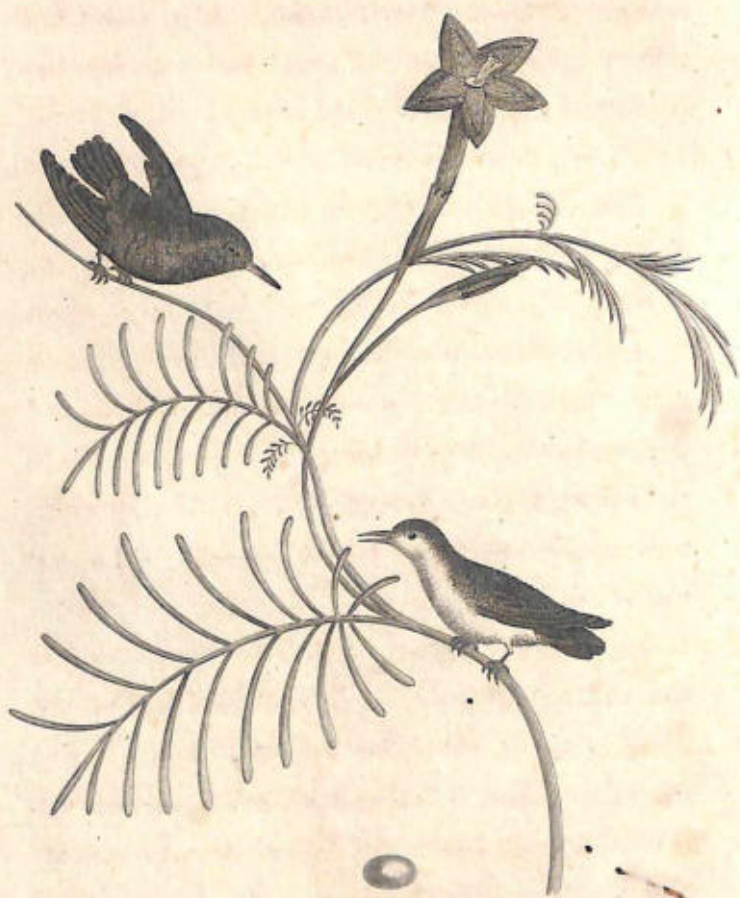
The structure of the tongue in the Humming-Birds, which constitutes the chief part of the generic character, cannot be sufficiently admired. It consists of a very long double tube, formed somewhat on the principle of the long trunk in some of the Moth and Butterfly tribe, except that instead of being rolled into a spiral form when contracted, it is merely withdrawn and doubled deep into the throat as in the Woodpeckers, and at the tip it is fringed on each side with a few horny hairs or processes. By means of this tongue the animal absorbs the sweet juice or nectar at the bottom of flowers, and always feeds on the wing, stretching out its



RED THROATED HUMMING BIRD

tongue in the manner of a large Moth, and darting off with the most rapid motion on the least apprehension of danger. One of the most common, as well as one of the most beautiful of all the Humming-birds is the *Trochilus Colubris* or red-throated Humming-bird, which is not confined to South America, but occurs also in most of the northern parts of that continent, and is even found as far north as Canada. Its colour above is green-gold, with purplish-brown wings, and tail, and beneath white, with the throat, to a considerable distance over the breast, of the most intense and vivid crimson, changing, on the least alteration of posture, into the most brilliant gold-colour, and again in some particular lights, into a very dark or blackish cast. As before observed, it is found in most parts of North America, and whoever places, in summer-time, some of its favourite flowers in the window, as the scarlet Monarda, the Balsamine, and some others, is sure of being visited by multitudes of this species of Humming-Bird. "The most violent passions," says an elegant writer, "sometimes agitate their little breasts: they have often dreadful contests, when numbers happen to dispute the possession of

the same flower: they will tilt against each other with such fury as if they meant to transfix their antagonists with their long bills. During the fight they often pursue the conquered into the apartments of houses which happen to have the windows open, and, taking a few turns round the room, like the flies in Europe, again make their escape into the open air. They are almost fearless of mankind, and, in feeding, will suffer people to approach within two yards of them, but if approached more nearly, fly off with the rapidity of lightening." An author of high credit, *Fernandez Oviedo*, in his *History of the Indies*, speaks from his own experience of the wonderful courage and spirited instinct of this minute bird in defence of its young. "When they see a man (says he) climbing a tree where they have their nest, they will fly at his face, and strike him in the eyes, coming, going, and returning, with such swiftness, that no man would lightly believe it that had not seen it." The nest is of an elegance suited to the architect, being composed of small fragments of mosses and lichens on the outside, and lined within with the down of the leaves of plants: it is somewhat like the nest of a Chaffinch



J. De Koenig sculp.

TROCHILUS MINIMUS
or
Least Humming Bird

in miniature, its internal diameter being about an inch, and its depth about half an inch. The bird lays only two eggs, which are white, round, and of the size of small pease. It is a general rule of nature that the smallest birds lay the greatest number of eggs, but in the Humming-Bird this rule seems reversed.

The smallest of all the Humming-Birds is the *Trochilus Minimus* of Linnæus; but it is not very splendid in colour, being of a dull gilded green above, with brown or purplish wings and tail, and white beneath; it measures only an inch and quarter in total length, from the tip of the bill to the end of the tail. It is a native of South-America, but is said likewise to be sometimes found in the island of Jamaica.

One of the largest of all the Humming-birds is the *Trochilus Pella* or Topaz Humming-Bird, the body of which is of the size of a Wren, but as the two middle tail-feathers greatly exceed the rest in length, and as the bill is also of considerable length, the total extent of the bird amounts to more than eight inches. The colour of the body is a deep brownish rose-red; of the back, wings, and tail purple; the head black, and the throat

and breast of the most vivid changeable polished-gold or topaz-colour, varying according to the light, into deep green. It is a native of Surinam. I should observe, that this very numerous genus is divided into two assortments, according to the shape of the bill, which is either *strait* or *curved*. The species just mentioned is one of the curve-billed kinds, but the two preceding ones belong to the strait-billed division. The Humming-birds have rarely been so coloured in the figures given in the works of naturalists, as to convey any very exact idea of their brilliant hues. An ingenious attempt has been lately made by a French artist, Audebert, to express by means of prepared gold itself, properly rubbed on the copper-plate used in the process, the metallic brilliancy of the birds; but though the work be highly elegant, yet it must be acknowledged that the experiment has not succeeded so completely as might be wished. The publication itself however is highly valuable, since it collects in one view more species and varieties than had ever been represented in any one work before. In this work also the peculiar structure of the brilliant feathers of the Humming-bird is well explained, and it is justly observed

that this is owing to the barbs or lateral plumes of the feathers being of a flattened form, of a somewhat horny structure, and so disposed as to form on each feather very numerous rows of concave cylindrical mirrors as it were, which very strongly reflect the light which falls upon them in different directions. There is one more particular to be noticed with respect to this curious genus, which is, that if we may rely on the observations of a French observer, who had frequent opportunities of examining their manner of life in the West Indies, some of the larger Humming-birds have been known to swallow minute insects as well as the juices of flowers; fragments of such, according to Monsieur Badier, having been sometimes found in their stomachs. This however is contradicted by others who have never been able to perceive any remains of insects in the stomachs of these birds, but merely the chrySTALLIZED saccharine matter or juice which had been extracted from flowers.

One would almost be tempted to suppose that in those cases in which the remains of insects had been found, some species of *Certhia* or Creeper had been mistaken for a Humming-bird; the *Certhiæ*

feeding on insects, and the smaller kinds being so nearly allied in appearance to the Humming-birds that they seem to differ only in the structure of the tongue, which is not of a tubular form.

LECTURE VI.

THE Order *Passeres* of Linnæus may be said to comprehend most of the smaller kind of land birds in general, together with some of a larger size than the rest. The natural characters of this order of birds are the following. The bill is formed so as to operate in the manner of a forceps; the limbs are rather weak than strong: their flight is quick, with a frequent repetition of the movement of the wings: they chiefly build in trees, or shrubs, and in general lay a moderate number of eggs, except some of the smaller species, which lay numerous ones. They excel in the art of nidification or constructing their nests. Their food is either animal or vegetable; some live chiefly on insects, some on seeds, and some on both. The whole order is considered by Linnæus as analogous to the *Glires* among Quadrupeds.

The Pigeon tribe, forming the first Linnæan

genus in this order, under the title of *Columba*, is by some referred to a distinct order called the Columbine. The generic characters of the Pigeon are a rather weak and slender bill, swelled at the base into a soft protuberance in which the nostrils are situated: the tongue is entire or undivided. The common Pigeon may stand as an example. To give a particular history of the Pigeon would be superfluous. In its wild state it is known by the name of the Stock-Dove, and inhabits the hollows of rocks and other similar situations. In its domestic or cultivated state it runs into a number of beautiful varieties, the culture of which forms a particular kind of business. This addition to the more rare and singular kind of Pigeons is not confined to modern times, but may be traced to the ancient Romans, who, according to the testimony of Pliny, were as far gone in the expensive varieties of tame* Pigeons

* Among others the variety called the carrier Pigeon was highly esteemed both among the Greeks and Romans: it is the nature of this bird to retain a very strong and almost invincible attachment to the place of its early residence: being therefore carried elsewhere, it hardly ever fails to fly back again to its native spot. If therefore marked by any particular token, as a signal of

as the moderns*. The Pigeon is the *C. Oenas* of Linnæus. It must not be confounded with the *Wood-Pigeon*, *Ring-Dove*; or the *Columba Palumbus* of Linnæus, which is of much larger size: in some writers, however, we find this latter bird improperly named the Stock-Dove. Thus Thomson in particular so names it.

“ The Stock-Dove only thro’ the forest cooes
Mournfully hoarse; oft ceasing from his plaint,
Short interval of weary woe; again
The sad idea of his murder’d mate
Struck from his side by savage fowler’s guile
Across his fancy comes; and then resounds
A louder song of sorrow thro’ the grove.”

intelligence; or if a letter be tied to its leg, it becomes the swiftest of all messengers. The tales related of this bird are almost incredible. One has been known to fly from Babylon to Aleppo, (which is considered as a distance of thirty days journey,) in the space of forty-eight hours.

* Linnæus observes that the domestic Pigeon commonly, or at least frequently, breeds once a month; laying two eggs each time: the increased production of the whole, would amount in the space of four years to the number of eighteen thousand. Others say that from a single pair of Pigeons may proceed *fourteen* thousand in the space of four years.

The species of Pigeons are excessively numerous, and many are remarkable for the splendor and beauty of their colours. Of the whole genus by far the most magnificent is the *Columba coronata* of Linnæus or great crowned Pigeon, a native of the East-Indian islands; in size not far inferior to a Turkey, and of a beautiful violet purple colour, with a very large, upright, compressed crest. The eyes are of the most vivid red, and the whole bird has an air of an unusual magnificence.

The Pigeons are succeeded by the numerous tribe of *Thrushes*, forming the genus *Turdus* of Linnæus. The species are so very numerous that those at present known may be supposed to amount to at least 160.

The character of the genus consists in having a straitish beak, slightly bending towards the tip with a small notch on each side: the nostrils are oval and naked.

The common Song-Thrush may stand as an example. It is brown above, whitish beneath, with reversed arrow-shaped spots on the breast and belly.

The Fieldfare is another species, brown above



GREAT CROWNED PIGEON



MOCKING THRUSH

1818 Oct. London Published by G. Rowley Fleet Street



ULTRAMARINE AMPELIS

Robt Vell's London Published by G. Kearsley Fleet Street.

with the head lead-coloured or blueish grey, the body white beneath.

Of the exotic Thrushes none are more remarkable than the celebrated bird called the *Mocking-Thrush*, or mocking-bird of America, the *T. Orpheus* and *Polyglottus* of Linnæus. Of this bird an animated description may be found in Mr. Pennant's *Arctic Zoology*.

The genus *Ampelis* or Chatterer, which is very nearly allied to that of Thrush, differs in having the nostrils concealed by small bristles growing over them.

It is not a numerous genus, but is remarkable for the extreme splendor of its colour. The *Ampelis Cotinga* for instance, or Ultramarine Ampelis, is of so intense and brilliant a blue as scarcely to be surpassed by any other natural object, not even by the blue exhibited on the wings of some of the larger exotic Butterflies. The *Pompadour Ampelis* is remarkable for its fine purple colour: both these species are natives of South America*.

* In the large picture at present before us, may be seen both these beautiful species by the ingenious pencil of the Chevalier de Barde; they are taken from select specimens in the Leverian Museum.

The only European species is the *A. Garrulus*, or Bohemian Chatterer of the older writers; it is a native of many parts of Europe, and is an occasional visitant in our own country. It is of a beautiful bright bay colour, with the larger wing and tail-feathers black, and is easily distinguished by the remarkable appearance of the secondary wing-feathers, which are each tipped with a small, flat, oval appendage, of a bright red colour and of a shining surface, like that of sealing-wax.

The genus *Loxia* or grossbeak, is remarkable for the thick or stout appearance of the bill in most species: it is a very numerous genus, and may be exemplified by the Bullfinch, the Cross Bill and many others, and particularly by the bird called the *Coccothraustes* or Grossbill.

The genus *Emberiza* is distinguished by having a moderately strong bill, with the gape or outline descending rather abruptly on each side the base, and the inside of the upper mandible is usually furnished with a hard or callous tubercle, serving for the convenient breaking of seeds and other vegetable substances on which these birds chiefly live. Like the genus *Loxia*, it contains a great number of species.



COCOETHRAUSTES or GROSSEBILL.

1808 Oct. London. Published by G. Kearsley Fleet Street.

The remaining genera of the Order *Passeres*, consist of the more *Slender-billed* small birds, or such as, from the structure of their beaks, are more calculated for feeding on the smaller and softer *insects* than on grain. *Linnaeus* ranges the major part of these birds under a vast genus called *Motacilla* or Warbler, the characters of which are a weak, slender bill, slightly notched at the tip: the tongue either divided or jagged at the tip, and the legs slender. These birds live principally on the smaller kind of insects and worms.

Among the principal species is the Nightingale, which is the *M. Luscinia* of *Linnaeus*, a native of most parts of Europe and Asia, and of a migratory nature. In our own country it arrives, as is well known, about the beginning of April, and leaves us in the month of August.

“ To every person, (says the Count de Buffon,) whose ear is not totally insensible to melody, the name of the Nightingale must recal the charms of those soft evenings in spring, when the air is still and serene, and all nature seems to listen to the songster of the grove. Other birds, the larks, the canaries, the chaffinches, the petty-chaps, the linnets, the goldfinches, the blackbirds, the Ame-

rican mocking-birds, excel in the several parts which they perform: but the nightingale combines the whole, and joins sweetness of tone with variety and extent of execution. His notes assume each diversity of character, and receive every change of modulation; not a part is repeated without variation; and the attention is kept perpetually awake, and charmed by the endless flexibility of strains. The leader of the vernal chorus begins the prelude with a low and timid voice, and he prepares for the hymn to nature by essaying his powers and attuning his organs: by degrees the sound opens and swells; it bursts with loud and vivid flashes; it flows with smooth volubility; it faints and murmurs; it shakes with rapid and violent articulations: the soft breathings of love and joy are poured from his inmost soul, and every heart beats in unison, and melts with delicious languor. But this continual richness might satiate the ear. The strains are at times relieved by pauses, which bestow dignity and elevation. The mild silence of evening heightens the general effect, and not a rival interrupts the solemn scene."

I must not omit to observe, that, according to

the united testimonies of all modern naturalists, the admired song of the Nightingale is that of the male bird, who thus employs himself, as if to entertain and soothe the female during her task of incubation; so that the celebrated lines of Virgil, however beautiful in point of poetry, are in reality inaccurate in point of natural history.

Qualis populea mœrens Philomela sub umbra
 Amissos queritur foetus, quos durus arator
 Observans, nido implumes detraxit; at illa
 Flet noctem, ramoque sedens, miserabile carmen
 Integrat, et mœstis late loca questibus implet.

So close in poplar shades, her children gone,
 The mother Nightingale laments alone:
 Whose nest some prying churl had found, and thence,
 By stealth, convey'd th' unfeather'd innocence.
 But she supplies the night with mournful strains,
 And melancholy music fills the plains.

Among the very numerous species of the genus *Motacilla*, every one must be acquainted with the common Water-Wagtail, or *M. Alba* of Linnæus; but so very marked and peculiar is the appearance of this bird and a few others nearly allied to it, that Dr. Latham in his excellent Ornithology, has instituted for these birds a separate genus to

which he confines the title of *Motacilla* or Wag-tail, while all the rest of the *Linnaean Motacillæ* are referred to a genus called *Sylvia* or Warbler.

Among the smallest and most curious birds of the genus *Motacilla*, may be numbered the Indian species called the *M. Sutoria* or small Taylor-bird. It is so named from its singular practice in building its nest, which consists of one or two leaves proper for the purpose, dexterously sewed together by the bird, which makes use for this purpose of any kind of fine vegetable filament that it can most easily procure. If the nest be prepared from one leaf only, the two edges are sewn together, so as to form a kind of pouch: if of two leaves, the edges of both are connected in a similar manner. The figure at present exhibited is copied from Mr. Pennant's *Indian Zoology*; and the original was a drawing in the possession of Governor Loten. The hollow of the leaves is filled up with cotton or feathers. The colour of the bird is yellow.

Among the European birds the genus *Parus* or Titmouse is distinguished for the remarkable neatness of the nest in some species; more particularly the elegant little species called the long-



SMALL TAYLOR-BIRD

tailed Titmouse, which builds a deep oval nest with a lateral opening. Others build pendent nests as the Polish T. or *P. pendulinus*.

Among the soft-billed Passeres or small-birds the genus *Hirundo* or Swallow is remarkable for many particularities. The characters of the genus consist in a small short bill, with a broadish base; a wide mouth or gape; a short, divided tongue; long wings, and short legs.

The common Swallow, or *Hirundo rustica*, is a migratory bird, varying its residence according to the season, on account, chiefly, of the insect tribes on which it feeds. If kept in a sufficiently warm apartment, and supplied with insect food, the common Swallow may be kept throughout the winter, without exhibiting any symptoms of an inclination to torpidity. It is well known that it has been by many supposed to remain torpid, or rather concealed in close caverns and other retired situations during the winter season; and this really appears to have been sometimes the case with the later broods; instances having been known of Swallows suddenly appearing on the tops of sunny buildings and rocks in the middle of winter. Among the most extravagant theories,

was that of the supposed submersion of the Swallow tribe under water during the winter; but I forbear to dwell any longer on a topic so often discussed, and shall recommend to those who may wish to pursue the arguments on all sides, relative to the dormancy of Swallows, to the pages of Pennant, Buffon, Klein, Willughby, and especially to those of the *Gentleman's Magazine*, where they may find an ample harvest of observations on the subject.

One curious circumstance should not be omitted in the history of the Swallow, which is, that the same pair have been known to return to the self-same spot in which they bred the year before: this has been observed for at least three years successively, and has been ascertained by marking the birds, before their disposition to migration, by a circle of red or other coloured silk fastened round their legs.

Allied to the Swallow genus is that of *Caprimulgus* or Goatsucker, a genus of birds, differing, as Linnæus observes, in the same degree from the Swallows that Moths do from Butterflies; for in reality the Goatsuckers may almost be considered as a kind of nocturnal Swallows. The bill is very

small in most species, but broad at the base, the gape or swallow excessively wide; the edges of the jaws beset with strong bristles, the wings long, and the tail even, or not forked. They are, in general, birds of moderate size, and are remarkable for their curiously variegated or speckled plumage, without any brilliancy of colour. The common European Goatsucker, the only species known in Europe, is a migratory bird, appearing in England during the summer months, and feeding, like the rest of this genus, on the larger kind of Moths, Beetles, and other insects*. The largest of the genus is the *Caprimulgus Grandis* or Great South American Goatsucker, in size scarce inferior to a Buzzard, and with a mouth so wide as to measure three inches in the gape, or from the tip of the bill to the angle of the mouth. Its plumage is a dull cream colour with very numerous brown freckles or variegations. But the most curious or singular of all the Goatsuckers is an African species discovered not many years ago in Sierra Leona, and which is somewhat smaller than the common European Goatsucker. It is

* It flies by night, and is sometimes called the Fern-Owl, or Churn-Owl.

remarkable for having two excessively long naked shafts, springing from the upper part of the shoulders, in the middle of the smaller covert-feathers: these naked shafts far exceed the length of the whole bird, and are dilated at the tip into a very large oval web or plumed part. This species, which in colour pretty nearly resembles the European species, is known by the name of the *Caprimulgus longipennis* or long shafted Goatsucker, and may be considered as one of the most remarkable of the whole feathered tribe.

The *Order Gallinæ*, to which we shall now turn our attention, contains the Gallinaceous birds, meaning such as are allied in habit or general appearance, as well as in their mode of life, to the common domestic fowl. This order comprises the Cock or Pheasant tribe, the Turkey, the Partridges and Quails, and several other birds of a similar nature. The birds of this tribe have, in general, heavy bodies, short wings, very convex, strong, and rather short bills, the upper mandible closing or shutting over the edges of the lower: they have strong legs, and the toes are usually connected at the base by a strong membrane, reaching as far as the first joint, and they are fur-

nished with rather broad claws, formed for scratching up the ground in search of food, and other purposes: these birds have also in general more than twelve feathers in the tail, in which particular they resemble the web-footed birds. The Gallinaceous birds feed chiefly on grains and seeds, and sometimes on insects: they build a nest of a careless structure, and in general lay numerous eggs. This tribe of birds is considered by Linnaeus as analogous to the tribe of *Pecora* or *Ruminants* among Quadrupeds. It is remarkable that, according to the old Mosaic Law, these birds alone were considered as pure, or proper for human food.

Of the common domestic fowl, of which the history and manners are too well known to require particular illustration, we need only observe that it is of East Indian extraction, and still occurs in its natural or wild state in some of the East Indian islands. In this state it is generally of a dark or blackish grey colour, barred and streaked with white variegations, and the narrow feathers of the neck have the shafts or middles dilated into a kind of horny tip. In its domestic state it is well known to run into very numerous

varieties, of which the most remarkable is that called the *Silk Fowl*, (*S. lanatus* Lin.) in which the whole body is covered with feathers so loosely webbed as rather to represent hair than plumes. This variety is most common in some parts of China and Japan. Another very remarkable variety of the common fowl is called the *Negro Fowl*, in which not only the whole plumage, but the comb, wattles, skin, and even the flesh itself are entirely black. This variety is said to be chiefly found in some of the lower parts of Africa.

The genus or particular set in which the fowl is placed is entitled *Phasianus*, and comprehends not only the fowl but all the Pheasants. Its characters are that the cheeks or sides of the head are bare, or covered by a naked skin: that the bill is short and strong, and that the legs, in most species, are armed with spurs.

The common Pheasant or *Phasianus Colchicus* of Linnæus, takes its title from the regions of the ancient Colchos, where it was formerly found, and from whence it was first brought into different parts of Europe. Of late years some other highly beautiful birds of this genus have been rendered



J. G. Koenig sculp.

ARGUS PHEASANT

common in our own country in a domestic state, as the Gold Pheasant of China or *P. pictus* of Linnæus, of which if we had seen the figure only, and not the bird itself, we might have rather imagined it to have been a mere pictorial animal, than a real or genuine species, so peculiarly vivid and varied is its elegant plumage.

The Argus Pheasant, so remarkable for its size and beauty, though unaccompanied by any brilliancy of colour, is a native of Sumatra, and has for many years been considered as constituting one of the chief ornaments of the European Museums.

There exists in China some very large species of Pheasant as yet undescribed, and known to us only from the long tail-feathers, which are sometimes brought over, and which are of such a length as to exceed six feet: their colour is grey, with very numerous brown bars.

This may perhaps be the bird mentioned by Marco Polo, who says that in the neighbourhood of the city of Sirigas in Carthage are large Pheasants, with tails measuring from seven to ten spans in length.

The *P. ignitus* or *Fire-backed Pheasant*, described in Sir George Staunton's Account of the Embassy to China, is a species, which till that period had either never been described, or so improperly and indistinctly as to convey no just idea of the bird. I confess however that I have some suspicion of its being very nearly allied to the *Guan* of Edwards's Ornithology. If so, it has been referred by Linnæus and others to a wrong genus, and considered as a species of Turkey.

The Turkey, so long domesticated in this country as well as in most other parts of Europe, is a native of North America, and by no means of India, as sometimes imagined. The genus to which the Turkey belongs is called *Meleagris*, and is distinguished by a short, thick bill, and the head and throat covered by spongy tuberculated, bare, reddish, or other coloured membrane. The Turkey in its native regions of North America is commonly of a black colour, accompanied by a coppery and greenish gloss. It is seen in numerous flocks, and is principally found in woods. A very fine specimen of the Wild American Turkey may be seen in the Leverian Museum. The

Turkey is commonly said to have been introduced into England, or cultivated in a domestic state, in the reign of King Henry the Eighth.

A very numerous genus called *Tetrao* or *Partridge* succeeds. It contains a vast variety of species, of which by far the major part are inhabitants of Africa and America. In our own country the two prevailing species are the Common Partridge and the Common Quail. The former of these is so well known that it would appear a mere loss of time to particularize its description. The latter or the Quail is less common; and is a migratory species, varying its quarters according to the season. The Quail, says an excellent ornithologist, seems to spread entirely through the old world, but does not inhabit the new: it is seen from the Cape of Good Hope even to Iceland; and throughout Russia, Tartary, and China; and is mentioned by so many travellers and in so many places, that we may almost call it a universal inhabitant of the old continent. In spring it migrates northward, and in autumn southward; and this in large flights, like most other migrating birds. Twice in a year such vast flights come into the island of Capri (in the

Archipelago) that the bishop of the island draws his chief revenue from them, and has thence been sometimes called the Bishop of Quails. Almost all the islands in the Archipelago, and on the opposite coasts, are also at particular times covered with these birds. On the western coast also of the kingdom of Naples, within a space of about four or five miles, have been taken no less than eight hundred thousand in a day. Great clouds of Quails are also occasionally seen to alight in spring on some of the French coasts, according to the testimony of the Count de Buffon. All these observations may therefore tend to confirm the account in the sacred writings of the Quail having been the bird sent, heaven-directed, in such countless flights, among the Israelites during their abode in the wilderness.

The Quail is the *Tetrao Coturnix* of Linnaeus, and is distinguished as a species by its pale chesnut-brown colour, with a whitish stripe down each feather, and by a whitish stripe over each eye.

In China is a species much allied to it but of a smaller size, and with a black crescent beneath the throat. This is the species trained by



DODO

the Chinese for fighting, in the manner of Cocks in Europe.

The Francolin is a beautiful species, about the size of the common Partridge or rather larger, and elegantly variegated with different colours: it is a native of the Grecian Islands, and is the *F. Francolinus* of Linnæus.

Among the Gallinaceous tribe we must by no means omit that most singular bird the *Dodo*, a very large and thick-bodied bird, formerly seen in the island of Bourbon in the Indian seas, as well as in some parts of Africa, but which for nearly two centuries appears to have eluded all the diligence of naturalists to detect. The only authentic original figure of the Dodo is a painting preserved in the British Museum, which is said to have been executed from the living bird, brought into Holland by the Dutch some time after the discovery of the Indies by the way of the Cape of Good Hope. The bird appears to be considerably larger than a Turkey, with very short wings, useless for flight, and with a large head, an extremely large thick bill, and very short, thick legs. A skin of a Dodo was preserved in the Museum of the famous John

Tradescant, at Lambeth, and was seen by our famous Ray, who mentions it in his Synopsis of Birds; but this skin appears to have been afterwards suffered to decay; the beak alone, with one of the legs, and that in a state of considerable decay, being now preserved in the Ashmolean Museum at Oxford, which is well known to contain the old collection of Tradescant. The Leg of a Dodo was also preserved in the Museum of the Royal Society, and is well described by Grew in his description of that collection: it is at present in the British Museum, and, (fortunately for ascertaining the real existence of so extraordinary a bird,) is in a good state of preservation; amply confirming the description given by Dr. Grew, and at once demonstrating to the eye of every ornithologist that it cannot belong to any other known bird. This leg, from the British Museum, with the beak from the Oxford Museum may be found amply described and figured in the Naturalists' Miscellany, where I have taken some pains to evince the existence of the animal, which has been sometimes considered as doubtful. The bird itself however is either grown so rare as to be no

longer easily discoverable in the regions where it was formerly found, or else, like some other animals, must have become extinct, from some causes of destruction with which we are unacquainted.

It would be unnecessary to observe that the generic characters of the Dodo, (which is the *Didus ineptus* of Linuæus,) are taken from the figures published by Edwards and others, and which have been copied from the painting in the British Museum. The colour of the Dodo is a variegation of black and white, as may be seen in the coloured engraving of Edwards. The figure of the Beak from the Oxford Museum, and of the Leg from the British Museum will give a sufficiently clear idea of the characters of the genus. The bill is strongly wrinkled or indented in the middle; and the legs are thicker in proportion to their length than in any other bird.

But the Pride of the order Gallinæ, and indeed of the whole feathered race, is the genus *Pavo* or Peacock; in the chief species of which, or *Pavo cristatus*, Nature seems to have exhausted all her powers of splendor combined with ele-

gance. The Peacock is a native of India, and when the conquering Alexander led his desolating Myriads into the peaceful plains of India, he is said to have been so struck by the sight of the Peacock in its native regions, and in the full magnificence of its plumage, as to have forbidden any one to destroy a Peacock under pain of death. It may not be improper to observe, on the subject of the Peacock, that the beautiful set of feathers springing from the lower part of the back, and usually called the tail, do not constitute the *real tail*, which is situated beneath them, and is short like that of a hen, and serves as a support to the long and beautiful feathers constituting the admired train, which, together with the upright and slightly revolute feathers on the head, constitute the characters of the genus *Pavo*.

There are two remarkable genera of birds, which are placed by ornithologists in different Orders; some referring them to the present Order *Gallinæ*, while others rather choose to rank them among the *Grallæ*. These are the genera called *Struthio* and *Otis* or Ostrich and Bustard. In reality the birds which rank under



OSTRICH

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these two genera seem to be of an ambiguous cast, and may with almost equal propriety be placed in either order. The genus *Struthio* or Ostrich is eminently conspicuous among birds; containing by far the largest of the feathered tribe. The generic characters consist in a somewhat conical, and slightly flattened bill; wings useless for flight, and feet formed for running, being destitute of the hind or back toe. The Common Ostrich, of which at least the general appearance and common history must be known to almost every one, is a native of the hottest parts of Africa; the body of the male is black, of the female brown; the wings and tail in both are white; the neck nearly bare, and of a flesh colour: the legs excessively strong, and the feet have only two toes, a particularity not to be found in any other bird.

The Ostrich is supposed to feed principally on vegetable substances: it has been accused, from the earliest times, of a proverbial neglect of its eggs, which it is supposed to leave in the sand without paying any regard to their security. Dr. Sparrman however is inclined to

believe that the male and female Ostrich sit by turns on the eggs, which are generally from ten or twelve to twenty in number; (not fifty, as mistakenly stated by Linnæus in the *Systema Naturæ*.)

Other travellers of high reputation assure us, that the male Ostrich, accompanied by three, four, or five females, makes a kind of nest or cavity, in which all the females deposit their respective eggs, which they all likewise sit on, the male occasionally relieving them by exercising that office himself.

The American or three-toed Ostrich was of course unknown till the discovery of that Continent. It is a native of South America, and perhaps the only specimen known in Europe is that in the Leverian Museum; but it has rather the appearance of a half-grown bird than one of its full growth. The colour of the American Ostrich is brown, with whitish wing and tail feathers, and the feet have three toes.

In the same genus with the Ostrich is by Linnæus placed the Cassowary, or Emu, under the title of *Struthio Casuarius*; but of late it has



CASUARIUS AUSTRALIS



CASUARIUS GALEATUS

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been rather considered as belonging to a distinct genus under the name of *Casuarius*, and is called *Casuarius Galeatus*. The Cassowary is a native of the East Indian islands, and was first brought into Europe by the Dutch, towards the close of the sixteenth century. It is of a coal-black colour, and is remarkable for the total want of wings, having only, in place of them, five or six strong, naked, horny spines or quills on each side: on the head is a very strong and somewhat flattened rising crest or helmet, down each side the neck run a pair of long spongy wattles of an irregular surface and of a mixed red and violet-colour. The feathers of this bird are remarkably long and narrow, so as to give the bird at first sight the appearance of being covered rather with hair than feathers: each feather is also double, two springing from one shaft or base: the legs are extremely strong, and the feet have three toes, all pointing forwards. Among the best representations of the Cassowary are those of Roberts in the seventeenth century, of Mr. Millar in his *Miscellaneous Plates of Natural History*, and Barraband in some plates lately published at Paris.

In New Holland is a species of Cassowary of rather superior size to the Indian Cassowary, of a brown colour, destitute of a horny crest, and in its whole appearance bearing a nearer resemblance to the Ostrich. It has been described under the name of *Casuarius Australis*.

The genus *Otis* or Bustard is characterized by a slightly convex and rather pointed bill, very open nostrils, sharp divided tongue, and long legs, naked above the knee, with feet formed for running, having three toes, all directed forwards. The chief Species is a European Bird, and is occasionally seen in our own country; sometimes in small flocks or groups, and sometimes singly. It chiefly frequents large open plains, is a very large bird, with long neck and legs, and of a yellowish brown colour, elegantly varied with numerous blackish transverse streaks and bars. The male bird has a membranaceous sack or pouch within the neck, for the purpose of holding water; this pouch is capable of containing several pints, but it is remarkable that the female bird is destitute of a similar apparatus. The general food of the bustard is supposed to be of a vegetable nature, but it also feeds on worms and insects,



BUSTARD

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and, according to some late observations, on rats and field-mice. A very extraordinary circumstance has been lately related of this bird; viz. that it has been known to descend suddenly from its flight, and from some unknown caprice, to attack a horse and its rider with great violence, and with such blind fury as to suffer itself to be seized by the traveller, rather than attempt an escape. Two instances of this are recorded in the Gentleman's Magazine of the date of about two years past.

The two remaining Orders of Birds are the *Grallæ* and *Anseres*, or the *Waders* and the *Web-footed Birds*. The former of these tribes is termed *Grallæ* on account of the general length of the legs in these birds, which in some genera is such as to give the appearance of the birds walking as it were on stilts, the Latin word *Grallæ* signifying a pair of stilts. The birds contained in this tribe are all the *Hérons*, *Cranes*, *Storks*, and *Bitterns*; all the *Snipe* and *Plover-kind*. The *Ibises*, the *Coots* and *Rails*, and several other birds, some of very large size, and some rather small. I must also here observe, that systematical ornithologists differ in

opinion as to the arrangement of some of the genera in the Order *Grallæ*, some of which appear of a dubious cast, and may with almost equal propriety be referred either to the *Grallæ* or *Gallinæ*; while others seem to hang in equal suspense between the *Grallæ* and the *Anseres* or *Web-footed* Birds.

In both these tribes I shall, as usual, particularize only some of the most important genera. We shall commence with the Order *Grallæ*.

The Order *Grallæ* is considered by Linnæus as analogous to the Order *Bruta* among *Quadrupeds*. The bill in these birds is generally rather long than short: the legs lengthened, and the thighs often bare of feathers above the knee. Their chief residence is in watery situations, and their food consists of various kinds of aquatic animals, though some feed also on vegetable substances. Their nests are often on the ground, sometimes in tall trees. It is observed that few of the birds of this order lay more than four eggs, and some genera only two.

Perhaps the most remarkable genus among the *Grallæ* or *Waders* is that of *Mycteria* or *Jabiru*. It is distinguished by having a very



NEW HOLLAND JABIRU



COMMON JABIRU

large, pointed beak, which instead of descending, as in the generality of birds, turns slightly upwards: the front or face is bare of feathers, and the legs are of great length, with feet of the usual or general structure; that is having three toes forwards and one backwards. The only species of this genus mentioned by Linnæus is the *Mycteria Americana* or Common Jabiru, a very large bird, a native of South-America, of a white colour, with the bill, long wing-feathers and tail black, and the neck bare, of a black colour, encircled at the bottom by a broad red zone or collar; but of late years two other species have been added to this genus, one of which is the bird now before us; it is called the *M. Senegalensis* or Senegal Jabiru, and differs from the American or Common Jabiru in having a pale or whitish beak, with a red base, and crossed near the middle by a broad black bar. Of this species a more particular description may be found in the fifth volume of the Transactions of the Linnæan Society. New Holland has also afforded another species, smaller than the former, and distinguished by having the

neck covered with feathers, and of a deep changeable greenish-black colour. A fine specimen may be seen in the Leverian Museum, now (unfortunately for the study of natural history,) condemned to dispersion. The birds of this genus are supposed to live in the manner of Herons, to which their whole habit bears a near resemblance.

The *Hérons*, which belong to a genus called *Ardea*, are by far the most numerous of all the tribe of wading-birds or *Grallæ*, and are distinguished by a rather large and long, strait sharp-pointed bill, generally marked on each side by a longitudinal furrow. Their legs are very long, and the feet of the usual or general structure, except that, in some species, the claw of the middle toe is deeply serrated or toothed on its inner edge, in order the better to enable such species to hold their prey, which often consists of fish, frogs, and other water-animals. The common Heron must be known to every one, and is a very frequent inhabitant of the country. The Crane, now so rarely seen, and that only as an accidental visitant, was once a constant inhabitant. It is a migratory species, and, unlike most of the genus,

feeds, at least principally, on grain of different kinds*. The largest bird of the Heron tribe is the East Indian species called the Hargil, or Giant-Crane, or Giant-Heron; chiefly seen in Bengal. It is of a blackish colour, with a naked yellowish neck, an extremely large beak, and a long, pendent craw or crop. On opening one of these birds, says an eminent traveller, was found a land-tortoise ten inches long in its craw, and a large black cat in its stomach. It is said to be easily tamed, and rendered domestic; in which state it has been permitted to fly about at pleasure in the neighbourhood, when it has been observed to sit on the tallest trees, and at the distance of two or three miles could spy the dinner carrying along the court-yard; and would then dart from its station, and soon join the company, and has been known to snatch up a whole fowl from the dish, and swallow it in an instant: the traveller adds, that the bone of a shin of beef, being broken asunder, served it but for two mouth-

* The Indian Crane or *Ardea Antigone* of Linnæus, is nearly allied in general appearance to the Crane, but differs in having a red bare collar round the neck: it is well figured in the works of Edwards.

fuls. A young bird of this species is preserved in the British Museum.

Many highly elegant birds belong to the genus *Ardea*, among which may be particularized the Egret or *Ardea Garzetta*, a beautiful white species, remarkable for affording, like some other birds of this tribe, a peculiarly elegant kind of long and delicate feathers, appropriated by heraldic rules to the decoration of certain orders of knighthood and other ceremonials.

The *Stork* is a large species of Heron, of a white colour, with the longer wing-feathers black, and the legs and beak of a bright red.

The *Bitterns* are a kind of Herons which differ from the rest in the thicker or shorter appearance of their bodies, and in the fulness of the feathers on the breast. The common Bittern, which is the *Ardea stellaris* of Linnæus, is a very elegant bird, of a pale yellowish brown, beautifully varied with darker streaks and specks: it is found in marshy situations, and is remarkable for uttering, during some particular states of the weather, a peculiarly loud and sudden noise, the nature of which has given rise to many disputes among naturalists, and is thus explained by Sir Thomas Browne. That a Bittor maketh that mugient noise, or



BITTERN



STORK

as we term it, bumping, by putting its bill into a reed, as most believe, or as Bellonius and Aldrovandus conceive, by putting the same in water or mud, and after a while retaining the air by suddenly excluding it again, is not so easily made out. For my own part, though after diligent enquiry, I could never behold them in this motion; notwithstanding by others whose observations we have expressly requested, we are informed, that some have beheld them making this noise on the shore, their bills being far enough removed from reed or water; that is, first strongly attracting the air, and unto a manifest distention of the neck, and presently after with great contention and violence excluding the same again. As for what others affirm of putting their bill in water or mud, it is also hard to make out. For what may be observed from any that walketh the fens, there is little intermission, nor any observable pause, between the drawing in and sending forth of their breath. And the expiration or breathing forth doth not only produce a noise, but the inspiration or hailing in of the air, affordeth a sound that may be heard almost a flight shot.

Now the reason of this strange and peculiar

noise, is deduced from the conformation of the wind-pipe, which in this bird is different from other volatiles. For at the upper extremity it hath no fit larynx or throttle to qualify the sound, and at the other end, by two branches deriveth itself into the lungs. Which division consisteth only of semicircular fibres, and such as attain but half way round the part: by which formation they are dilatible into larger capacities, and are able to contain a fuller proportion of air; which being with violence sent up the weazon, and finding no resistance by the larynx, it issueth forth in a sound like that from caverns, and such as sometimes subterraneous eruptions from hollow rocks afford. As Aristotle observeth in a problem; and is observable in pitchers, bottles, and that instrument which Aponensis upon that problem describeth, wherewith in Aristotle's time gardeners affrighted birds.

Whether the large perforations of the extremities of the weazon, in the abdomen, admitting large quantity of air within the cavity of its membranes, as it doth in Frogs, may not much assist this mugency or boation, may also be considered. For such as have beheld them making this noise



SCARLET IBIS

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out of the water, observe a large distention in their bodies; and their ordinary note is but like that of a raven."

The Hudson's Bay Bittern or American Bittern, elegantly figured in the works of Edwards, is very nearly allied to the English Bittern, but of rather smaller size. The *Ardea minuta*, or Smallest Bittern, is not much larger than a Thrush, and has been sometimes found in England.

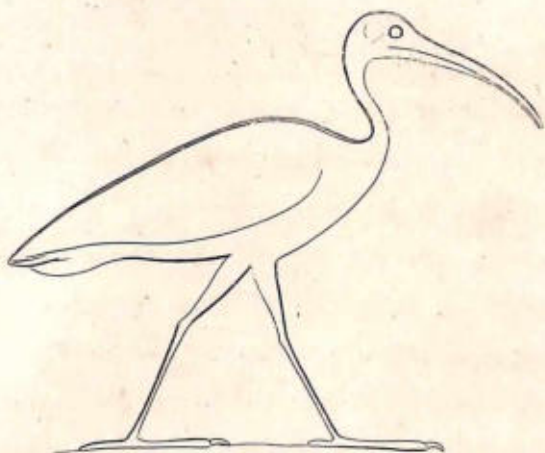
The genus of birds called *Tantalus* claims our attention, from its having been supposed to contain the celebrated bird called the *Ibis*, so much esteemed by the ancient Egyptians, for its useful quality in destroying various troublesome reptiles and other animals. The Linnæan genus *Tantalus* is distinguished by having a long, curved bill, not sharpened, but rather slightly rounded at the tip; and the front or fore-part of the face is covered by a bare skin. One of the handsomest species is the *T. Ruber* or scarlet *Ibis*, a native of South-America, and entirely of a most brilliant scarlet colour, except the tips of the wings, which are black: its size is that of a common fowl.

The Egyptian *Ibis* has generally been sup-

posed to be the *T. Ibis* of Linnæus, a large species, of a white colour, with the tips of the wings black, and the beak yellow. From the examination, however, of such specimens of embalmed Ibises as have lately been brought over from Egypt, Monsieur Cuvier is of opinion that the Egyptian Ibis is not the *T. Ibis* of Linnæus, but either the same with, or very nearly allied to, the bird described and figured by Mr. Bruce, under the title of *Abbou Hannes*. It is about the size of a Curlew, and is of a white colour, with the tips of the wings and the scapular-feathers black, the base of the beak greenish, and the head slightly tinged with brown. The bird however embalmed by the ancient Egyptians, and examined by Cuvier and others, has the head and neck naked or bare of feathers, and of a blackish colour, a particular which I do not recollect that Mr. Bruce has mentioned in his description; nor does it appear in the figure annexed to the description, in which both the head and neck appear plumed; so that it is not quite clear that Mr. Bruce's bird is really the Ibis of the ancient Egyptians, or that it is the same with the Ibis of Monsieur Cuvier. It is

OUTLINE of an IBIS
from an Egyptian Obelisk

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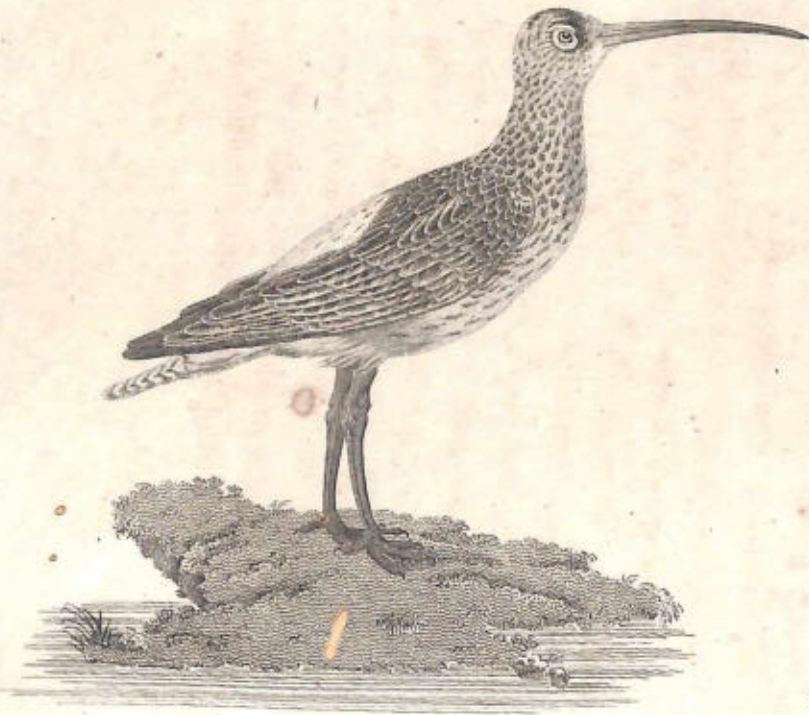
EGYPTIAN IBIS

most probable that the Egyptians held several different species of this genus in nearly equal veneration.

Herodotus tells us he was assured that the Egyptians were annually invaded by swarms of small flying serpents, which were attacked, conquered, and killed by the Ibis, which on this account was revered by the Egyptians. He adds that he had been shewn heaps of the bones of these serpents near the confines of the deserts. As to the winged serpents, we well know that no such animals are now discoverable; and it is not very probable that any such have ever existed. The animal called the Dragon indeed, or the Flying-Lizard might be adduced as in some degree justifying such an idea; but the Dragon is a harmless animal, whereas the Flying-Serpents mentioned by Herodotus are supposed to have been highly poisonous. An ingenious French author, Monsieur Savigny, so far from supposing any natural antipathy to exist between the Ibis and the serpent tribe, imagines that neither the Egyptian Ibis nor any other of the genus feed on such reptiles, being by no means calculated for such a kind of food, but that the

whole is nothing more than a metaphorical illustration of the effects of the hot south-winds and clouds of sand, which at a particular period, viz. during the spring, invade, or as it were threaten the borders of Egypt, at which time all manner of contagious diseases prevail, and of the salubrious effects of the cooling north-winds, which blow after the inundation of the Nile, at which time the Ibis makes its appearance, and may therefore be said to have conquered the winged Serpents; i. e. the hot winds, with all their accompanying evils. The Cerastes or horned Serpent, which is an inhabitant of the hot sandy deserts, was therefore very naturally made an emblem of the malignity of these winds, with their accompanying sands and diseases; while the Ibis, which so constantly accompanied the effects of the cooling north-winds and the recovered verdure of the country, became a kind of emblem of salubrity, and of the conquest over the winged Serpents.

The Egyptians, according to this author, instead of saying in common language, The sands, in which the Cerastes resides, are blown into the air and arrive among us with their train of evils;



CURLEW



GUARANA

Agouti sculp

may perhaps overwhelm our cultivated lands and cause our destruction; and venomous serpents may then possess our abodes as they now do their native deserts; instead of speaking thus, they would say in metaphor, *The Flying-Serpents will destroy Egypt*. In the same manner, when, by the effect of the north-winds the country was purified, and the Ibis, the harbinger of fertility, re-appeared, they would say, *The Ibises have conquered the Serpents*. Lastly, the sands, accumulated on the confines of the desert, arrested by vegetation in those places where the openings between the hills afforded them a passage, might well be denominated *the heaps of bones*, which declared the victory of the Ibis, and justified the veneration paid to the bird.

The genus *Numenius* or Curlew is so closely allied to that of *Ibis*, that it only differs in not having a naked front. The common Curlew is a native of our own island, and is often seen on our coasts. Its colour is pale-brown, varied with deeper brown, and the lower parts are white. The genus is not very numerous, but some of the exotic species are birds of considerable elegance; one in particular which sometimes strays into this country, and is of a brilliant coppery-brown colour,

with greenish, iridescent variegations, according to the direction of the light. It is naturally an inhabitant of Russia, Siberia, and other distant regions, and is the *Numenius igneus* of modern ornithologists.

Another exotic species much allied to this, and which though a native of South-America, has been seen on the British coasts, is the *N. Guarauna*, which is by Linnæus referred to his genus *Scolopax*. I must also here observe that the supposed Egyptian Ibis or the *Abbou Hannes* of Bruce, may be considered as a *Numenius* rather than a Linnæan *Tantalus*.

Among the most singular genera of the *Grallæ* or Waders, is a genus called *Parra*. It is distinguished by a slightly obtuse beak of moderate length, by a rising scolloped flap or naked skin above the base of the bill in front, by a spine or sharp horny process on each shoulder, and lastly by the immoderate length of the toes and claws, which in some species nearly equal half the length of the body. The *Parra variabilis*, or variable *Parra*, called the *Jacana*, is well figured in the works of Edwards, and is of a chesnut colour above, white beneath, with green wings. It is a



VARIABLE JACANA



TRUMPETER

native of South-America, and is represented in Edwards's plate in its natural size. But the most remarkable bird of the genus is called the faithful Parra or faithful Jacana; it is the Parra Chavaria of Linnæus, and is of the size of a common domestic fowl. It is chiefly of a blackish brown colour, deeper beneath, and stands high on its legs; the toes and claws being of such a length as sometimes to entangle one another in walking. This bird is easily tamed and rendered domestic, in which state it is made the guardian of all the other kind of poultry, which are committed to its care in the same manner as a flock of sheep are to that of their attending dog. During the day-time it defends them from all birds of prey, being able, by means of the spurs on its shoulders, to drive off even Vultures themselves. It is said never to desert the charge committed to its care, going out with them to proper situations by day, and very regularly bringing them all safe home at night.

Of a similar disposition and manners is another South American bird belonging to the order Grallæ, but of a different genus, called *Psophia* or Trumpeter from the peculiarity of its notes.

The genus *Psophia* has a shortish, pointed bill, long legs, and feet of the usual structure. The principal species is called the Golden-breasted Trumpeter, and is a rather large and tall bird, of the size of a domestic fowl, with a long neck, and of a grey colour above, black beneath; the breast of a changeable golden-green with a blackish cast. This bird is also tamed by the South Americans, and made use of as a guard to their poultry in the same manner as the *Parra Chacaria* before described, but seems to be somewhat inferior to that bird in its character and qualities. The Trumpeter is by some ornithologists rather referred to the Linnæan order Gallinæ than that of the Grallæ. Indeed it seems to partake of the nature of both these orders.

The genus *Platalea* or Spoonbill is too remarkable to be passed over in silence. Its character is a long flattened bill, dilated at the tip into a broad and slightly rounded expanse. The common or European Spoonbill, which was once a native of our own island, but which has long since ceased to appear among us except as a mere accidental straggler, is about the size of a Stork, and of a white colour, with the bill and legs blackish or



SPOONBILL.



TURNSTONE



Engelgale sculp

LONG LEGGED PLOVER

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deep brown. It is recorded by Mr. Pennant that a flock of these birds migrated into the marshes near Yarmouth in the year 1774. In Holland they were once considered as common birds, but are now become more rare. In South-America is a highly beautiful species, similar in size and general appearance to the European Spoonbill, but entirely of a bright rose-colour. South-America also produces a very small species of this genus, which is said by Linnæus hardly to exceed the size of a Sparrow, and is of a brown colour above, and white beneath. The birds of this genus are observed to live in the manner of the Heron tribe, on fish, reptiles and water insects, and they build their nests on tall trees.

The two genera of *Tringa* and *Charadrius* contain all the birds of the *Snipe* and *Plover* tribe, and are very much allied to each other, but in the genus called *Tringa* the feet are furnished with a back toe, whereas in the genus *Charadrius* there is none. Of the genus *Tringa* the *T. Interpres* or Turnstone may serve as an example; and of the genus *Charadrius* one of the most remarkable species is the *Ch. Himantopus* or long-legged Plover; one of the rarest of the British birds;

black above, white beneath, with red legs of a most extravagant length.

The last genus of the *Grallæ* which I shall particularize, is the Flamingo or *Phoenicopterus*; it is distinguished by a large, broad, but rather thin bill, suddenly bent down in the middle as if broken, and finely toothed or serrated on the edges. The Red Flamingo is a most extraordinary bird, of the size of a Goose, but with a neck and legs so enormously long as to appear out of proportion to the rest of the animal. The colour of the whole bird when full grown is a vivid scarlet, with the tips of the wings black. It is a native of Africa and of South America, frequenting the sea coasts and the brinks of rivers, and feeding in the manner of the Heron tribe, on fish and water insects, and sometimes on vegetables.

As the feet in the Flamingo are pretty deeply webbed, it may be considered as forming a kind of connecting link between the *Grallæ* and the *Anseres*, or web-footed swimming-birds, to which we shall now direct our attention.

The *Anseres* consist of such birds as have very strongly or conspicuously-webbed feet, and are, from their general structure, calculated for swim-



Figura 100

FLAMINGO

ming. They consist of the Swan or Goose-tribe, the Penguins, the Gulls, the Grebes, the Pelicans, and several others.

This order is considered as analogous to the order *Belluæ* among the Mammalia. The bill in these birds is in general either somewhat dilated at the tip, or furnished with a kind of nail or appendix at that part, and in most it is so constructed as to operate as a sort of strainer, the edges being toothed with slight prominences. The feet in all are very widely webbed, the legs strong and short, and the whole body stout, fat, and muscular. Their food consists of fish and other water animals, and frequently of water-plants. Their rest is generally on the ground; but sometimes on lofty rocks: the number of eggs in the birds of this order differs greatly in the different genera, some laying only one egg; others two; others four, and others a great number, from ten to twenty.

As the chief examples of the tribe of Anseres or web-footed birds, may be adduced the wild and tame Swan, or the *Anas Cygnus ferus*, and domesticus; the genus *Anas* containing all the birds distinguished in common language by the

names of Swans, Geese and Ducks. This genus is distinguished by having a broad, slightly convex bill, toothed along the edges by numerous small cartilaginous plates or processes, disposed like the teeth of a comb; and the tongue is obtuse, fleshy, and slightly toothed or pectinated at the edges. The two birds often confounded together by naturalists, under the titles of the wild and tame Swan, are now found to be truly distinct; nor does the difference consist merely in the exterior appearance, but in the interior organization; the trachea or wind-pipe in the tame Swan being simple or straight, while in the wild Swan it is very strikingly reflected or doubled into the sternum or breast-bone, so as to be able to utter the powerful note for which the bird is remarkable. The wild Swan is rather smaller or more slender than the tame, with a black beak, and a yellow cere at the base; while the tame Swan, on the contrary, has a red or orange beak, with a large, globular, black cere at the base.

Every one has heard of the supposed musical voice of the Swan, which was believed to be particularly exerted during its latest hours, when it reclined on the banks of its native waters, and

took leave of life with a sweetly-mournful song or dirge. So strongly was this idea impressed on the minds of the ancients, that the Swan became the symbol of poetry; but false as it really is, it seems to have had its excuse, and to have originated from some exaggerated descriptions of the natural notes of the wild Swan; the flocks of which, during their flight, have been often observed to emit a sound far from unpleasing in concert, though the general notes of a single bird are harsh and stridulous. The tame Swan has no other voice than a mere hiss: yet so common appears to have been the general belief of its musical powers, that the celebrated Aldrovandus, in his Ornithology, speaks, as he imagines, from good authority, of the music of the Swans upon the Thames near London, which he had been well assured, were very frequently heard to sing.

Sir Thomas Brown, with his usual depth of learning and solemnity of diction, endeavours in his *Pseudodoxia Epidemica*, or *Vulgar Errors*, to explode this popular notion, and concludes with this sentence: "When therefore we consider the dissention of authors, the falsity of relations, the indisposition of the organs, and the immusical

note of all we ever beheld or heard of, if generally taken, and *comprehending all Swans*, we cannot assent thereto: surely he that is bit by a Tarantula shall never be cured with this music; and with the same hopes we may expect to hear the harmony of the spheres."

There is a highly curious species of Swan, a native of some parts of New Holland, and the neighbouring regions, called the Black Swan, which I have myself some years ago described under the name of *Anas Plutonia*. It is sometimes brought over to this country in a living state, and whoever has closely attended to it, must have been struck with the sweetness of the tones which it occasionally utters: they are not of long continuance, but singularly melodious. I must here observe that the black or southern Swan, though so lately made familiar to the European Naturalists, from the discoveries in the Southern Pacific, appears to have been known to navigators a great many years ago, since on some of the older kind of globes and maps, we may occasionally observe about these regions, an inscription importing that black Swans are there to be found.

The genus *Pelecanus* or Pelican, is distin-



Cygnus atris.

BLACK SWAN



COMMON PELICAN

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guished by a loose dilatable skin beneath the lower mandible, and by widely webbed-feet, with four toes all turned forwards. The great or common white Pelican is a native of many parts of the old Continent, and is of the size of a Swan, with an enormous pouch under the bill, capable of containing a vast quantity of fish, on which the bird chiefly preys, as well as of water, which it is said occasionally to carry to its mate while engaged in incubation.

The Corvorant is a species of Pelican, though the sac or membrane under the bill is but of slight extent in this bird. The Corvorant is a native of England, and though a web-footed bird is often observed to sit or rest in trees: it builds on high rocky cliffs. It has been sometimes tamed and used for fishing, by putting a brass collar round its neck, &c. The Chinese employ a different species for this purpose, which is described and figured in Sir G. Staunton's Embassy to China. It is very nearly allied to the Corvorant, but is of a brown colour above, and whitish with brown spots beneath. According to Sir G. Staunton's account, these birds are carried in boats by their proprietors on the rivers, and are so well trained

as not to require any ring round their necks, but spring into the water at the command of their owners, and soon return with their prey in their mouths.

Among the Goose tribe we may particularize a species often found in the northern parts of our own island, and called the Bernacle Goose or Clakis: it is commonly supposed the *A. Erythropus* of Linnæus, and is black above with the feathers barred or edged with white. This is the bird which the vulgar, and even some of the learned once supposed to have been produced, not in the manner of other birds, from an egg, but from a peculiar kind of shell-fish called the Bernacle, an animal which we shall have occasion to particularize when we arrive at that department of Zoology.

One of the most singular genera among the Anseres or the web-footed swimming-birds, is the genus Penguin, *Aptenodytes* or *Pinguinaria*. We cannot but recollect, that among quadrupeds there are some particular kinds, which in point of external appearance, seem to make an approach to animals of a different cast or nature; thus, the *Manis* has so much the appearance and make of a Lizard that, if outward form alone were con-

sidered, it might be looked upon as constituting link between the proper or viviparous quadrupeds and lizards. The *Jerboa* and the *Kangaroo* have the usual actions and attitudes of birds; generally standing on the hind legs only. The *Bats* may also be adduced as quadrupeds of an anomalous nature, and possessed of the power of flight; while the *Cetaceous tribe* affords a striking instance of the gradual declension of the quadruped form, till in the *Manati* it approaches to that of a very different class of beings. Even among birds there are not wanting some instances of the same sort of indistinct alliance to animals of an opposite cast; the *Penguins*, which I have just mentioned, being furnished with wings so very short, covered with feathers so very small, so much resembling scales, and so perfectly useless for flight, that they seem approximated in some degree to fishes, and are capable of exercising with ease and expedition no other actions than those of swimming and diving; since when they attempt to walk, they can merely stagger along in an awkward manner, and if disturbed are liable to stumble and fall.

The genus *Penguin* is not very numerous and

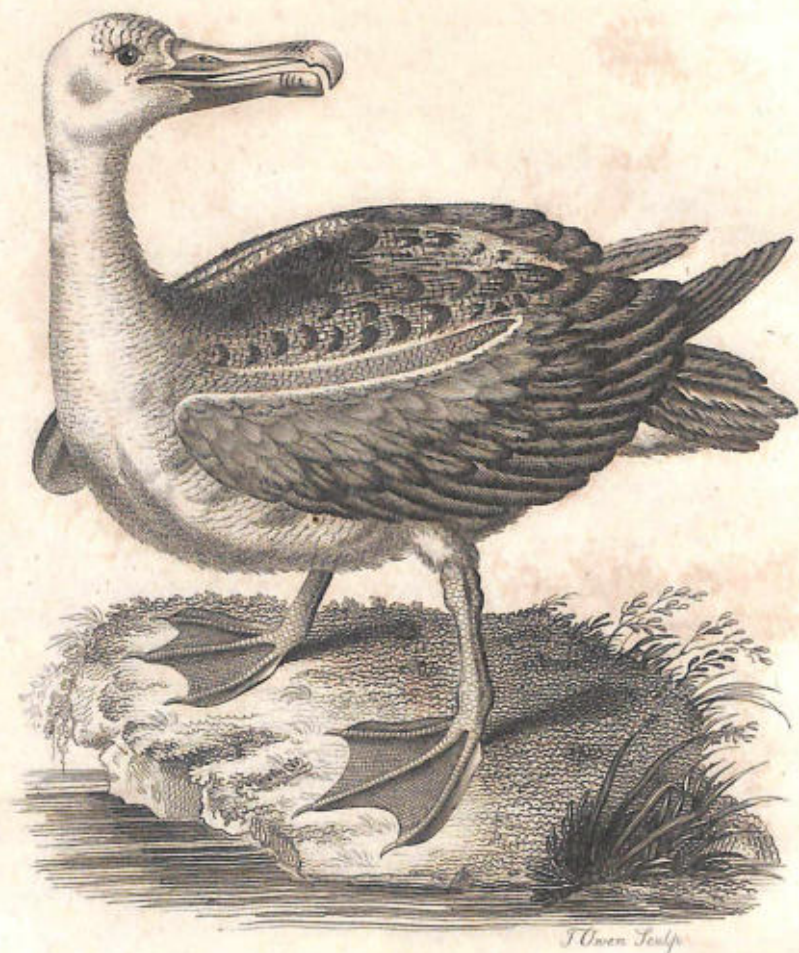
the largest of all is called the Patagonian Penguin; it is about the size of a Swan, and of a deep or blackish ash colour above, and white beneath: the head is black, and the beginning of the neck marked by a yellow collar, descending on each side from the eyes. It is an inhabitant of the Magellanic seas; the other species of Penguin are also natives of the Antarctic regions, and are in general about the size of a common Duck. The generic character of the Penguins consists in having a strong but rather narrow bill, slightly bent towards the tip, nostrils linear, and wings useless for flight; all the four toes placed forwards. There is a European bird, occasionally seen on our own coasts, which a beginning ornithologist might be inclined to suppose a Penguin; and which indeed is often called the northern Penguin. Its colour is black above, and white beneath, and its size that of a Goose. In the shortness of its wings, and its general appearance, it greatly resembles a true Penguin; but belongs to a different genus, called *Alca* or Awk, and is the *Alca impennis* of Linnæus. It is the only bird of its genus that is incapable of flight; the rest of the Awks flying with great strength. The generic



GREAT AWK



PATAGONIAN PENGUIN



WANDERING ALBATROSS

character of the Awks consists in a strong, thick bill, compressed on the sides, and marked by transverse furrows: the feet three-toed, all directed forward.

With respect to the real or southern Penguins, we may observe, that Linnæus having seen but two species, and paying too strict a regard to the mere form of the beak, arranged them most unhappily in the same genera with the Tropic-Bird or Phaeton, and with the Diomedea or Albatross, both remarkable for their power of wing, and the aerial elevation of their flight.

The Albatross or Diomedea, is a very large bird, of a white colour when full-grown, varied with shades of brown, but when young often of a blackish colour, with a very large bill, and wings of so great an extent as sometimes to measure more than ten feet.

It is so remarkable for the extent of its migrations, that it may almost be said to pass from pole to pole, and is seen at a greater distance from land than any other known bird. It is the *Diomedea exulans* of Linnæus, and the wandering Albatross of the English ornithologists, and is pretty well represented in the works of Edwards.

The other genus, or *Phaeton*, with which Linnæus once associated the Penguins, merely on account of the form of the beak, is called the Tropic-Bird. The principal species is the *Phaeton æthereus* of Linnæus, and is so named from the vast height to which it soars. It is about the size of a large Duck, but more slender in proportion, of a silvery white colour, with numerous transverse blackish bars or streaks, and has the middle tail-feathers extremely slender, and of a vast length in comparison with the rest. It is rarely seen beyond the limits of the Tropical regions. Another species is of a pale rose colour.

After these examples of the tribe *Anseres* or web-footed swimming-birds, it would be unnecessary to dwell on the less conspicuous genera of the order. I shall therefore request your attention in my next Lecture, to the animals distinguished by the title of Amphibia.

END OF VOLUME I.





PHAETON ÆTHEREUS

