

## **Introduction to the catalogue of the Ashmolean Museum.**

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INTRODUCTION  
TO THE  
CATALOGUE  
OF  
THE ASHMOLEAN MUSEUM.

— Alii solliciti videntur ne in naturæ inquisitione aliquid inveniri possit, quod religionem (præsertim apud indoctos) subvertat, aut saltem labefactet. At vere rem reputanti, philosophia naturalis, post verbum Dei, certissima superstitionis medicina est, eademque probatissimum fidei alimentum. Itaque merito religioni donatur tanquam fidissima ancilla; cum altera voluntatem Dei, altera potestatem manifestat. *Bacon. Nov. Org.* l. i. s. 89.

Inductio quæ ad inventionem et demonstrationem scientiarum et artium erit utilis, naturam separare debet per rejectiones et exclusiones debitas; ac deinde post negativas, tot quot sufficiunt, super affirmativas concludere—hujus inductionis auxilio non solum ad axiomata invenienda, verum etiam ad notiones terminandas utendum est. Atque in hac, certe, inductione, spes maxima sita est. *Bacon. Nov. Org.* l. i. s. 105.



## INTRODUCTION.

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**T**HE Museum presented to the University, and deposited in Oxford in the year 1682, by Dr. Elias Ashmole, contained the first collection of objects illustrative of natural history which was ever formed in Britain; perhaps the first which was ever opened to public inspection in any nation of the whole world. This collection was made by the sagacity and industry of two ardent lovers of all that is beautiful and wonderful in nature, both named John Tradescant, a father and son. The father was in 1629 gardener to king Charles the First. The son travelled in North America, and imported new plants to the garden, and rarities to the Museum, which was called the Ark, and duly visited by the dignified and the enlightened. The younger Tradescant bequeathed the Museum in 1662 to Ashmole, who was his friend and the inmate of his house <sup>a</sup>.

The collection was certainly begun when natural science was in its infancy. Conrad Gesner, the illus-

<sup>a</sup> He was created Dr. of Physic by diploma in 1669. He was a member of Brazen Nose College, and received his diploma from Dr. Yates, then principal. He had served under king Charles the First, as captain and comptroller of the ordnance in the garrison at Oxford; and held the office of Windsor herald, with several other honourable appointments, under king Charles the Second. He died in 1692, aged 76.



trious and profoundly learned father of modern zoology, called the German Pliny, died 1565. Aldrovandus had died poor and blind, in the hospital of Bologna, his native city, on which his learning conferred glory, in the year 1605. His works however, together with those of Gesner, doubtless gave stimulus and guidance to the labours of the Tradescants. Ray and Willoughby were nearly contemporary with the son.

If we suppose the elder Tradescant to have begun his collection in the year 1600, it will not be a subject of wonder that most of the skins of the animals, then doubtless prepared with less skill than modern art supplies, should be in a state quite unserviceable to the purposes of science in the year 1824, when a renovation of this department of the Museum was attempted.

Several skins of fishes and reptiles, horns of African beasts, and bones of the elephant, the hippopotamus, and the grampus, still attest the well directed ardour of the Tradescants. The legs and beaks of a few birds also are preserved, amongst which, two deserve especial notice. One is the beak of the helmet hornbill, from the East Indies, which has been but lately imported in the entire state, having been long suspected to have been a foolish imposition contrived to deceive Tradescant<sup>b</sup>. Latham states that a specimen is in the British Museum. Two are reported to have been lost among the other valuable stores of science collected by sir Stamford Raffles. The head of the dodo, or dodar,

<sup>b</sup> A perfect specimen is in possession of Mr. Leadbeater, to whose activity and skill zoology is greatly indebted.



is the sole specimen existing of a bird larger than a swan; presented probably by Mr. Thomas Herbert to Tradescant; and brought by him from the island of Mauritius, where only it is reported to have been ever seen, and where it certainly does not now exist. That the stuffed skin was in the Tradescantian collection is proved by the Catalogue, and by the incidental mention of it in Hyde's *Religio Veterum Persarum*<sup>c</sup>, and by the statement of Ray.

## PRINCIPLES OF ARRANGEMENT.

The Museum contains,

1st. Ancient Relics.

*a.* Egyptian—very few. Fragments. Idols. Mummies.

*b.* Grecian—very few. Coins. Models.

*c.* Roman—very few. Idols. Weapons. Tesseræ. Numerous Coins. Urns.

*d.* British—very few. Beads. Instruments. Coins. Fragments.

2dly, Arms of different nations.

3dly, Dresses and Implements of half-civilized nations.

4thly, Rarities.

*a.* Royal gifts.

*b.* Memorials of remarkable persons.

<sup>c</sup> We are obliged to Mr. Barclay of Bury-hill, Surrey, and to his very intelligent correspondent Mr. Tellfair, for an accurate investigation of the island of Mauritius, which leaves no doubt of the former existence and present local extirpation of the whole genus. The term *genus* is used, not *species*; for the preserved beak and leg, either considered separately or together, would not admit of their classification with birds of any other genus.



*c.* Amulets.

*d.* Works of curious art.

5thly, Pictures.

6thly, Books, manuscript and printed.

7thly, Specimens illustrative of zoological arrangement—collected with a hope of continually exciting a remembrance of the pious works of Derham and of Paley.

Should all these things be thrown together in confusion by an earthquake, or by haste to save them from a fire, how should we restore order? Undoubtedly by observing what things were like in kind or in quality, or in form, or in relation one to another, or in relation to the common purpose of the collection, and what things were unlike to the former, but possessing separate similitudes and relations one with another. It is just in the same manner that the logician arranges ideas and propositions. He assorts them according to their agreements and disagreements. The universal or common agreement of the things under our notice is their relation to the Museum. They are doubly divided by a secondary notice of relation into assemblages of artificial and of natural objects. These are again subdivided into groupes, forming species with relation to antecedent divisions, and genera with relation to the subsequent. The word *λόγος* signifies the principle of order; *logic*, the art of order. The assignment of a place of any individual to be classed with a species, or of any species with a genus, is a syllogism. The peculiar characteristic which distinguishes any one division from that which is antecedent or subsequent to it, is said to define it. This characteristic may be important or trivial, permanent or variable. If it be



true, and easy to be apprehended, although trivial, it may be useful for the minor purposes of convenient reference. Books may be ranged according to their size or colour; and so likewise may birds, beasts, and insects. More important differences and more permanent will be selected by any arranger who knows more than their surface, who knows their relations each to each, and to some common object. Thus in the infancy of science the humblest attempt at arrangement has its use. These remarks are intended to be applied chiefly to the specimens of natural history, where the agreements which extend to many divisions can only be distinguished from those which extend to a few by attentive observation and comparison.

In the arrangement of a Museum, a manifest end should govern the disposition of every part; for example, the promotion of useful knowledge, or its direction to the glory of God.

This, with respect to natural science, is the leading object of Ray, Derham, and Paley. If the Natural Theology of the latter be regarded as an arrangement of specimens referring to the important end, his cabinet will first display a watch and all its parts; 2. a telescope; 3. dissected eyes; 4. the mechanism of ears; 5. seeds and eggs; 6. human anatomy; the osseous system; 7. the muscular system; 8. the vascular and secretive system; 9. the brain and nervous system; 10. comparative anatomy and peculiar organizations; 11. prospective contrivances; 12. compensative contrivances and general relations. The theatre of anatomy, under the able direction of Dr. Kidd, supplies whatever an exhibition may want for the illustration of this system of



argument; which however cannot fail to be duly suggested by a view of the diversities and similitudes which are selected as the distinguishing marks of classes, genera, and species, by Linnæus and other naturalists.

Diversity of external form and colour strikes every eye. Its effect upon the mind is continual excitement; without which our faculties would become torpid. If light were not opposed to shade, colour to colour, eyes would be useless. The air so necessary to our existence is unperceived, except by invalids, or by those who pass through great changes of place, as mountaineers, miners, or some manufacturers. The diversities of nature, as well as of society, give continual exercise to the human intellect, and from this exercise it derives continually augmented energies. The faculties indeed are innate: they are adapted to excitement: but all the diversities by which they are excited are adapted and harmonized, and appear to have their existence for the especial purpose and end of producing such excitement.

Diversity is involved in all our ideas of extent or magnitude. From immeasurable diversity of formation we infer immeasurable formative power. The term *formation* stands for the result of power and agency, which has produced a particular condition of materials, which materials appear on examination not to possess any power to change or move themselves. All diversity of organized being exhibits and proves the production of such condition or relation of parts to parts in single beings, and of one to another in groupes, to be adapted to a clearly definable and important end. The operation of such



power is called *design*. Hence arises the conviction that the immensity of natural diversity is a perpetual demonstration of the immensity of designing power. Man is but a part of that diversity. Can he be an indifferent spectator of that evidence which continually displays his relation to the great Designer?

Diversity of power and of design might perhaps be manifested by the attainment of innumerable ends by innumerable means: but faculties very different from those of man would be requisite for the comprehension of such evidence. Immensity of power might be manifested by the adaptation of definite means to innumerable ends; but human experience is limited, and clearly inadequate to objects of unlimited extent.

In the present condition of creation innumerable means and materials may be employed directed to ends of which we have no comprehension. But only a few means and materials are manifested to our view, and these are adapted to a few easily perceived ends. But the modes in which they are adapted are diversified beyond the utmost enlargement ever yet attained by human science.

We can perceive therefore diversities continually extending before us far greater in amount than many successive generations may with any probability hope to define and enumerate: yet all, hitherto known, present to our contemplation a limited number of materials variously modified to a limited number of ends.

Similitude limits diversity.

The adaptation of similar means or modes of being to similar ends connects many individuals (however differing in other respects) by such relation of simi-



litude. The adaptation of different means, differing from the former, but similar each to each, to the same ends, congregates other individuals in an assemblage characterized by such new relation of affinity.

1. One single relation of similitude or analogy extends to and connects all objects: all bear marks of creative power. The universal aggregate is designated by the universal term *creation*.

Of created things, some are celestial, some sublunary. This is a second relation of similitude or analogy, or first grand division of natural objects.

Of sublunary objects, some are ponderable, some imponderable. To the first subdivision belong all solids and liquids: to the second belong things aërial or empyreal; as fire, air, gas, electricity, magnetism. This is a second grand division of objects. The celestial part of the first division does not belong to the Museum: it is therefore merely indicated as a collateral branch of a pedigree. The imponderable branch of the second division is, for a similar reason, merely mentioned for the purpose of separation.

3. Organization is a relation of similitude or analogy, extending to, including, or, as logicians say, predicable of fewer objects than are included under the preceding terms. Organized beings have three agreements; sublunar beings or things, two; created, one.

Organized beings are animal or vegetable. Here is a third division, each distinct branch of which possesses three common agreements, and one peculiar character of affinity. Of vegetable organization it is not intended to say more than is requisite to distinguish it from that which is peculiar to animals.



4. Animal is a general or universal term, designating, 1, all created beings, 2, sublunar, 3, ponderable, 4, organized, 5, conveying food by a mouth into a stomach<sup>d</sup>.

Vegetables are 1, 2, 3, 4; 5, *absorbing fluids by roots*.

Writers of natural history have called these divisions, by a metaphor, *kingdoms*; and the name may be retained without fear of confusion from the adoption of a term common to things so wide asunder as physics and politics.

As agreements are multiplied, diversities of course are proportionably diminished, although by daily experience proved to be numerous far beyond the bounds yet approached by human science.

The division of the animal kingdom into great groupes or assemblages possessing some additional agreement, and into minor groupes having more numerous similitudes, is, apparently with great accuracy, distinguished by Lamarck and Cuvier, according to an important diversity of structure, into two parts, namely, 1, animals with vertebræ, and, 2, animals without vertebræ. In the first subdivision are included all beasts, birds, fish, and reptiles. In the second, all insects, slugs, worms.

A division might be made, according to the habits of animals, as determined by their peculiarities of structure, into animals aquatic and animals terrestrial. But a third division would occur of animals chiefly destined to move in air. Yet the limits of

<sup>d</sup> The seeking food by voluntary motion belongs to the definition of an animal; the absence of volition to that of a vegetable: but volition, being an object solely of consciousness, is not included in an arrangement confined to objects of sense.



these divisions being less easily defined, their diversities and similitudes may be more conveniently pointed out, to characterize subdivisions.

Aristotle, after an extensive enumeration of those similitudes of animals which lead us to pronounce them to belong to the same species and the same genus, concludes his sixth section or chapter by complaining of a difficulty arising clearly from the imperfect state of the science, namely, *the want of good general names*: Τοῦ δὲ γένους τῶν τετραπόδων ζώων καὶ ζωότοκων εἶδη μὲν ἐστὶ πολλὰ, ἀνώνυμα δέ—διὸ καὶ χωρὶς λαμβάνοντας ἀνάγκη θεωρεῖν ἐκάστου τὴν φύσιν αὐτῶν.

Modern naturalists have divided vertebrated and invertebrated animals into various subdivisions, called *classes, orders, families, genera, and species*.

In a successive view of the fewest similitudes extending over the greatest number of objects, a division of animals into pulmonary and impulmonary, with and without lungs, should follow that of vertebrate and invertebrate, as the term *pulmonaria* extends to mammalia, aves, and amphibia; and *impulmonaria* includes pisces, insecta, and vermes. Vertebrata is manifestly a more extensive division than pulmonaria, as it includes pisces. The division invertebrata is more complete than that of impulmonaria, which in fact includes two such clearly distinct conditions of organs adapted to the reception of air into the animal system, that the positive difference is more striking than the negative similitude. There is, besides, a second agreement in the impulmonaria, namely, the absence of red colour from the blood. Pulmonaria may in regular sequence be subdivided into two subdivisions: animals having lungs with warm red blood, *calidisanguia*, and animals with



lungs and cold red blood, *gelidisanguia*. And pulmonaria into two divisions; *branchialia*, with gills and cold white blood; and *spiraculosa*, without gills and with cold white blood.

Another similitude is now to be observed amongst all mammiferous calidisanguia; all are *viviparous*. All calidisanguia without mammæ are *oviparous*. Gelidisanguia are nearly all oviparous. Some striking exceptions, however, may be noticed in distinguishing genera, or the groupes or assemblages of fewer differences and more similitudes.

By far the greater number of viviparous animals possess teats for the purpose of affording a milky secretion, not constantly prepared, like blood, but temporarily, and manifestly expressly adapted to the new wants of the tender progeny. The exceptions are so few as to deserve more attentive examination than they have hitherto received.

The Linnæan system (adopted in part by Blumenbach) ranges all animals in six classes, under the following general titles and discriminations.

1. *Mammalia*. Animals giving suction to their young; viviparous; with warm red blood.
2. *Aves*. Oviparous; feathered; with warm red blood.
3. *Amphibia*. (including reptiles.) With cold red blood; lungs.
4. *Pisces*. Cold red blood; gills in lieu of lungs.
5. *Insecta*. Cold white blood; with articulated and hard organs of motion; with antennæ.
6. *Vermes*. Cold white blood; without antennæ, or distinct articulated organs of motion<sup>c</sup>.

<sup>c</sup> Linnæus gives this account of his scheme: Methodus anima



It is obvious, that many differences of objects are calculated to strike the senses instantly. The perception of similitudes must be the result of comparison, often of laborious attention, and of far extended investigation.

Similitudes of few parts are called classes; of more parts, are orders; of yet more, genera; of all, or nearly all, species. Thus says Aristotle: "Ἐχει δὲ τῶν ζώων ἓν μὲν πάντα τὰ μέρη τὰ αὐτὰ ἀλλήλοις, ἓν δὲ ἕτερα. Ταῦτα δὲ τὰ μὲν εἶδει τῶν μορίων ἐστίν, &c.

Similitudes are of wholes to wholes; as man to man: or of parts to parts; as, in quadrumana, monkeys to apes, &c.: or of general habits; as, in carnivora, bears to lions: or natural destinations; as to fly, to live in water, and to burrow in the ground; to build nests, to live singly or in pairs, or to congregate; to produce live progeny, or eggs, or spawn; to mature the young *in utero*, as most of the mammalia, or *in marsupio*, an external pouch, as the opossum: or finally, to possess or employ different means for the multiplication of species, as frogs and fish.

7. If our knowledge of all similitudes and dissimilitudes in the objects of our arrangement were perfect, no difficulty in arrangement could exist. But our imperfect knowledge frequently confounds things like with things unlike; hence, as knowledge advances, changes in arrangement and in nomenclature

scientiæ indigitat, primo intuitu, quodcunque corpus naturale, &c.—Ut sic in summa confusione rerum apparenti summus conspiciatur naturæ ordo. Systema apte quinque tantum dividitur: sic,

<i>Classis.</i>	<i>Ordo.</i>	<i>Genus.</i>	<i>Species.</i>	<i>Varietas.</i>
Genus summ.	G. intermed.	G. proximum.	Species.	Individuum.



of orders and genera are frequently found to be requisite.

In considering similitudes of parts with parts, it is obvious that in some animals the clearly corresponding parts are more distinct than in others, and more clearly adapted to important functions. In some, the adaptation of organization to varied and to peculiar modes of subsistence seems to be full and complete; in others, to be partially defective, although generally attended with some compensating provision. Aristotle, whose whole mind seems to have been powerfully but too early exercised on imperfect materials, says, if we consider the more and the less, the excess on the one hand and defect on the other, we shall find agreements sometimes of entire similitude, sometimes of mere analogy. *Τὸ γὰρ μᾶλλον καὶ ἥττον ὑπεροχὴν ἢ τις καὶ ἔλλειψιν θείη. Ἐνία δὲ τῶν ζώων, οὔτε εἶδει τὰ μόρια τὰ αὐτὰ ἔχει, οὔτε καθ' ὑπεροχὴν καὶ ἔλλειψιν, ἀλλὰ κατ' ἀναλογίαν.*

Much enumeration of evidence will not be required to prove, that the adaptation of the arms of man to numerous and important functions is superior to that of the corresponding limbs of the monkey tribes, of the fore-legs of other beasts, and even of the wings of birds; although the latter possess one obvious advantage peculiarly connected with their difference of destination.

The animals which appear to be endued with the greatest number of distinct and powerful organs, adapted to the most important purposes of animal life, are to be found in that class of warm-blooded animals which bring forth a full-formed living progeny contradistinguished from those warm-blooded animals which in parturition produce eggs.



Of viviparous warm-blooded animals, all appear to sustain their newborn offspring by a milky secretion, which only takes place at the time of approaching parturition. As this accordance is common to all, no contradistinction can take place; as of non-mammiferous opposed to mammiferous, *mammicarentia* to *mammalia*<sup>f</sup>.

Mammalia, or the mammiferous, is then correctly chosen as the first class for subdivision into orders and genera.

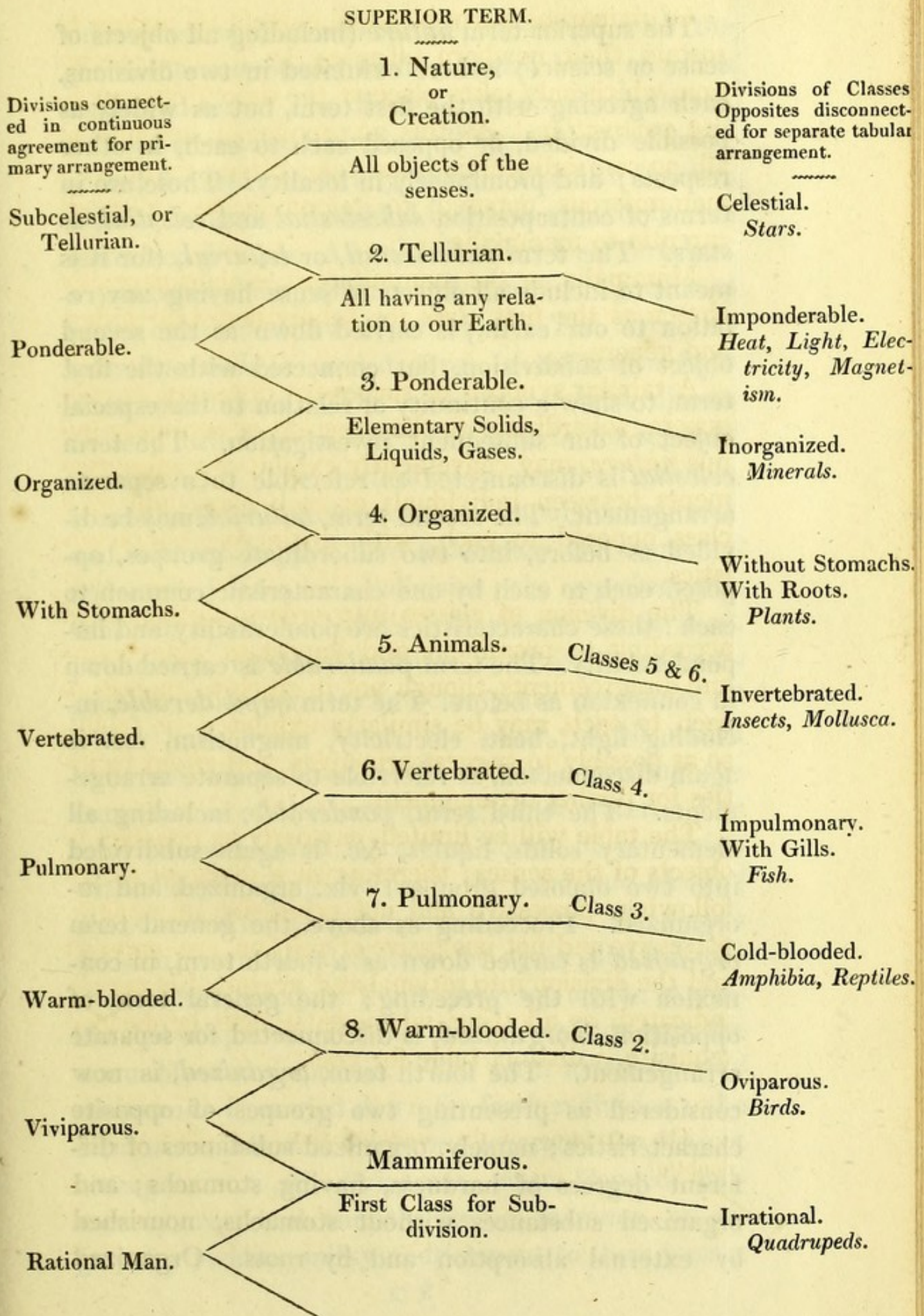
A tabular synopsis of successive divisions, or subgenera, subordinate to the superior, or summum genus *nature*, may conveniently exhibit mutual agreements between individuals of each class, and of a class opposed to each, with distinctive characteristics.

The division of classes into orders, distinguished according to prominent and important agreements and disagreements, though not in absolute opposition each to each, may be similarly exhibited in tables, so as possibly to suggest principles, and afford facilities for further arrangement.

The table will be limited, as nearly as possible, to objects of the senses; therefore such divisions as the following, possessive and not possessive of vitality, possessive and not possessive of volition, are omitted; and the division into rational and irrational is merely indicated, as allotting, whenever it shall be deemed requisite, a distinct table for man.

<sup>f</sup> The exception of the *ornithorynchus* and *echidna* being doubtful.







The superior term *nature* (including all objects of sense or science) is here exhibited in two divisions, each agreeing with the first term, but as widely as possible divided, or opposed each to each, in other respects; and prominently in locality. These are in terms of contraposition *subcelestial* and *celestial*, as stars. The term *subcelestial*, or *tellurial*, (for it is meant to include all objects of sense having any relation to our earth,) is carried down as the second object of subdivision, but connected with the first term, to shew a continuity of relation to the especial object of our subsequent investigation. The term *celestial* is disconnected as referrible to a separate arrangement. The second term, *tellurial*, may be divided as before, into two subordinate groupes, opposed each to each by one characteristic common to each: these characteristics are ponderability and imponderability. The term *ponderable* is carried down in connexion as before. The term *imponderable*, including light, heat, electricity, magnetism, &c. is again disconnected, as referrible to separate arrangements. The third term, *ponderable*, including all elementary solids, liquids, &c. is again subdivided into two opposed groupes; viz. organized and inorganized. Proceeding as above, the general term *organized* is carried down as a fourth term, in connexion with the preceding; the general term of opposition, *inorganized*, is disconnected for separate arrangement. The fourth term, *organized*, is now considered as presenting two groupes of opposite characteristics; namely, organized substances of different degrees of hardness, having stomachs; and organized substances without stomachs, nourished by external absorption and by roots. Organized



substances, with stomachs, are connected with the general term *animal*, which is carried down as a fifth connected term. The division, organized substances, without stomachs, including all vegetables, is disconnected for separate arrangement. The fifth division, *animal*, is again subdivided into two oppositely characterized groupes. All animals either have vertebræ, a connected chain of bones, including some portion of brain, or are destitute of vertebræ. The term *vertebral animals* is carried down in connexion for a sixth subdivision. The term *invertebral*, disconnected, including mollusca and insects, for separate arrangement. The sixth division, vertebral animals, is subdivided into pulmonary and impulmonary, with and without lungs. The pulmonary are connected and carried down for subdivision; the *impulmonary*, fish, set apart as before. The seventh division, pulmonary, vertebral animals, is divisible into two groupes, with opposite characters; one consists of all which have warm blood, the other, of all which have not warm blood, or blood not exceeding the temperature of the surrounding air or water. The term *warm-blooded* is carried down in connexion with the preceding division; the term *cold-blooded* disconnected for a separate arrangement. The eighth division, warm-blooded, may be again divided into those which produce living progeny, or the warm-blooded viviparous; and those which produce eggs, the warm-blooded oviparous. The term *warm-blooded viviparous* is carried down for farther division; the term *warm-blooded oviparous* separated for distinct arrangement. All viviparous, warm-blooded, pulmonary, vertebral animals possess mammæ, or organs for yielding milky nourishment to their young.



The 9th division is called the mammiferous, the class *mammalia* of Linnæus and Blumenbach ; which, as before said, may be subdivided into *rational* and *irrational*. But here closes the great division by antithetical characteristics. The division rational is confined to man alone, and cannot therefore be so subdivided. His characteristic, rational, the possessing powers of voluntarily combining and comparing ideas with a view to present or future intellectual delight, and to future operation, to communication with others by means of language, and to the modification of various objects of the senses, with a view to remote convenience and enjoyment, belongs to the separate science of mind. But in common with irrational mammiferous animals, his race is viviparous, warm-blooded, pulmonary, and vertebral. He has also four limbs, attached to a trunk, which contains the stomach, vertebræ, lungs, and heart. These limbs are obviously destined for locomotion, and for the purposes of obtaining food.

The class called mammiferous, or *mammalia*, is now selected for particular examination. The classes have obviously been distinguished by separating one groupe of objects, in which one characteristic is conspicuous from all in which it is absolutely wanting, then subdividing that first groupe of accordances into two more, one of which possesses, in addition to the prior character of agreement, a second, certain and conspicuous, and the other of which is totally without this second object of agreement ; and proceeding thus till we find a groupe, all of which agree in many points of similitude, and of which none are so different from the rest as to be clearly and absolutely opposite in any characteristic, however



widely different in the modification of analogous parts.

Thus the different destination of mammalia to a life chiefly on land, and a life chiefly or wholly in water, is a difference which is manifestly attended with a modification of external form, but not much greater in the two divisions than that which is found among different animals belonging to either of the two divisions. It may be however convenient to examine them separately; and to divide the class mammalia into two divisions, terrestrial and aquatic.

In considering the general conformation and habits of these two divisions of mammiferous animals, it must immediately occur, that some constantly feed on other animals, either wholly or principally, that some wholly feed on vegetables. This seems to require a secondary separation or subdivision into animalivorous and herbivorous.

Animalivorous terrestrial mammalia, for the most part, possess teeth of three kinds, called incisives, canine, and grinders. The herbivorous possess teeth only of two kinds; but as the difference is not constantly found in accordance with the peculiar selection of food, the character may be noticed in subordination to other more easily defined objects of subdivision.



TABLE I. CLASSES OF ANIMALS.

Vertebrata.	1.	Mammifera.	Warm-blooded.	Viviparous.	<i>Beasts.</i>
	2.	Pennifera.	Warm-blooded.	Oviparous.	<i>Birds.</i>
	3.	Amphibia.	Cold red blood—with lungs.		<i>Reptiles.</i>
	4.	Branchialia.	Cold red blood—gills.		<i>Fish.</i>
Invertebrata.	5.	Insecta.	Cold white blood—hard and articulated limbs—antennæ.		<i>Insects.</i>
	6.	Mollusca.	Cold white blood—no articulated limbs—no antennæ.		<i>Worms, Slugs, Medusa, &amp;c.</i>

The two latter are by some differently divided; the divisions are named *gangliata* and *radiata*, from peculiarities of the brain or nervous filaments.

In *gangliata* the brain surrounds the gullet like a collar, sending out filaments which expand and unite in knots, including *annulosa* and *mollusca*.

In *radiata* the nervous matter appears to be generally disseminated, not collected in the form of brain and connected filament. Including, with several minor animals, the *infusoria*.



## PROPOSED SCHEME

OF

*External characters generally indicating peculiar habit and food.*

## TABLE II. ORDERS.

## CLASS I. MAMMIFEROUS ANIMALS.

1st Division, TERRESTRIAL.		2d. AQUATIC.	
Animalivorous.	Herbivorous.	Animalivorous.	Herbivorous.
Teeth, 3 kinds.	Teeth less than 3 kinds.	Teeth of 3 kinds.	Teeth less than 3 kinds.
1. Bimanous. Omnivorous.	6. Sessiliped. Long hind-feet, occasionally used for sitting upright. (A few are partly animalivorous.) <i>Hare, Kangaroo, Squirrel, Mouse, Rat, Beaver.</i>	11. Palmate. Webfooted. <i>Otter, Seal, Ornithorynchus.</i>	12. Palmi-pinnate. Between feet and fins. Herbivorous. <i>Trichecus manatus, or Laman-tin. Halicora, or Dugong, Triche-cus Rosmarus, or Walrus.</i>
2. Quadrumanous. Opposable thumbs on hands and feet. Omnivorous. <i>Lemur, Ape.</i>	7. Quincungulous. Five hoofs, with proboscis. Wholly herbivorous. <i>Elephant.</i>	13. Pinnate. Finned. <i>Dolphin, Grampus, Porpoise, Whale.</i>	
3. Unci-digitate. Crooked-clawed, no thumbs.  2 Subdivisions. a. Digitigrade. Wholly animalivorous. <i>Lion, Dog.</i> b. Plantigrade. Occasionally herbivorous. <i>Bear, Badger.</i>	8. Triungulous. Three hoofs, horny nose. Wholly herbivorous. <i>Rhinoceros.</i>		
4. Alidigitate. Claws connected by membrane. Animalivorous. <i>Bats.</i>	9. Bisulcate. Two hoofs or toes, ruminators. Wholly herbivorous. <i>Ox, Deer, Camel.</i>		
5. Quadrifurcate. Four pointed hoofs. Animalivorous and herbivorous. <i>Swine, Hippopotamus, Tapir.</i>	10. Solidungulous. Single-hoofed. Wholly herbivorous. <i>Horse, Ass, Zebra.</i>		



The tabular synopsis of orders, however inexact it may appear to the more learned, yet may serve to illustrate the preceding observations with sufficient clearness.

It will readily occur, that many other characteristics of animals might be taken as bases of arrangement, either distinctly or commencing in immediate subordination to almost any one of the above classes, or in connexion with it. For example, organized beings, with stomachs, have eyes visible or not visible, in sockets of the skull or otherwise; ears visible or untraceable; organs of touch external over the body, or not so; tongues or no tongues; organs of smelling variously circumstanced.

Dr. Harwood, in the first (and, alas! the sole) chapter of his intended first volume of Comparative Anatomy, of which he was professor in Cambridge, published 1796, arranges quadrupeds according to the olfactory bones.

To form the outline of such a plan, let the seal be placed at the head of the scale carnivorous, and the deer at the opposite extremity of herbivorous quadrupeds; and the intermediate orders according to the different degrees of affinity in the shape, situation, and structure either of the ramified or turbinated olfactory bones. A more extended scheme might be drawn out on the following plan:

Seal	}	Carnivorous—the olfactory bones ramified.
Cat		
Dog		
Hog	}	Herbivorous—the olfactory bones turbinated.
Horse		
Deer		

The orders of Linnæus are divided according to differences of teeth.



Mons. De Blainville, in a complicated system of kingdoms, subkingdoms, types, subtypes, with much curious distinction, enveloped in new Greek compound terminology, makes his first division into three subkingdoms.

1. Artiomorphic, animals complete with limbs in pairs, artiozoaires.

2. Rayonnées, radiated animals, actinomorphes or actinozoaires.

3. Irregularly formed animals, heteromorphes, heterozoaires or amorphozoaires.

His distinctions deserve the attention of the studious naturalist.

Cuvier's orders or primary divisions of the class mammifera are named in the first place from hands; as, 1. Bimana, having hands and feet: 2. Quadrumana, hands only: 3dly, from food, as Carnivora: 4thly, from the mode of feeding, as Rodentia: 5thly, from defect of teeth, as Edentata: 6thly, from thickness of hide, as Pachydermata (a Greek name irregularly herding among Latin ones): 7thly, from a peculiar mode of feeding, as Ruminantia: 8thly, from the Latin undescriptive name of a species, as Cetacea. This scheme wants uniformity of plan and of terminology.

Blumenbach takes his discrimination of orders from the principal organs of locomotion and action.

1. Animal bimanum. 2. Animalia quadrumana. 3. Cheiroptera. (Alipedia or Alimana would be more regular.) 4. Digitata. 5. Solidungula. 6. Bisulca. 7. Multungula. 8. Palmata. 9. Cetacea. (Pinnata would suit the plan better.)

This arrangement of Blumenbach, derived partly from Linnæus, partly from Cuvier, with additions



and improvements, is adopted in our Museum, with some variation, as upon the whole best suited to an exhibition of zoological diversities.

Distinctions may be taken from almost every division of the body, taken singly or in conjunction with others: from different forms of the stomach and intestines conjointly with different forms of teeth or otherwise; from different positions of mammæ; from different conditions of skin, as smooth and bare, or tubercled and shelly, as hairy, bristly, woolly, furry, scaly, or prickly; and from different conditions of the lungs, which distinguish the terrestrial from the amphibious.

Distinctions of different animals may also (as before remarked) be taken from the peculiar mutual relations, destinations, and habits. Some are *gressilia*, walkers on earth; some *scansoria*, climbers; some *volatica*, fitted for flight; some *natatilia*, fitted for swimming; some gregarious; some solitary; some carnivorous; some insectivorous; some herbivorous; some ferocious; some insidious; some gentle; some shy and timid; some acute of sight, some of hearing, some of scent; some heavy and slow in form and habit; some light and swift.

The mutual adaptations of different objects or parts of creation one to another, of beings wholly disjoined without local connexion or any similarity of condition, is a full demonstration of a distinct adapting Power, preordaining such mutual destinations, providing means for their continuance, and limiting their extent. But this ordaining and controlling Power extends throughout the heavens, and adapts the sun to the mutations of the earth, to the atmosphere, to the waters and their inhabit-



ants, to the earth and its products, to all plants, and to all endued with locomotive power and with life. This Ordainer, operating through all extent, has adapted all by mutual relations to beings endued by such ordinance with limited life, with consciousness, with perceptivity, with reflection, with resolution, with passion, with hope, with fear, with awe, with exultation and delight; and God hath said, "Rule over the fish of the sea, and the fowl of the heaven, and every beast that moveth on the face of the earth."

An exhibition of specimens, however numerous, cannot by any possibility display these most interesting relations; but it may suggest, and its only claim to attention from the seekers of soul-improving and ennobling truth, is, that its tendency is continually operating to impress the existence of such relations, to stimulate the desire to explore them by an extended study of that universal order, by which the Ordainer is manifested even from the heavens, which declare the glory of God, to the firmament, (of earth,) which sheweth his handywork.

The general principles of arrangement above stated are of course addressed to those to whom the subject may be nearly or wholly new. All systematic writers have necessarily been more or less guided by them, but appear to have lost sight of them occasionally from the want of some fundamental plan, which duly simplified logic can alone supply. The order of nature may most effectually lead to the order of ideas. The order of ideas and of language can alone form a correct record of the knowledge of nature, acquired by men of the same age or country, or of different realms and generations. The



science of nature has perhaps a tendency to interfere with and to draw its followers aside from the pursuits of ambition, and avarice, and sensual voluptuousness. It has therefore not met with many friends. The student of wonders, not immediately convertible to tangible profit, has been regarded for ages either with contempt as a madman, or with fear as a magician. Even in highly civilized countries the rich and the poor have generally regarded his pursuits as the feeble efforts of childish curiosity, and appear, like the Arabs who watch the toils of the antiquary amidst the ruins of Upper Egypt, to have conceived that the sole motive to the inquiry is the hope of obtaining hidden treasures. To such discouragement may be attributed the notorious fact, that from the days of Aristotle, who lived 350 years before the Christian era, to those of Gesner, who died in the year 1562, a space of about 1900 years, the school of nature appears to have been nearly without a student, Pliny being merely a copyist of Aristotle, a lover of the marvellous rather than of the true, and an inconclusive reasoner. The seventeenth century produced Aldrovandus, who greatly advanced the work of zoological arrangement in his books *de Quadrupedibus Digitatis*, *Solidipedibus*, *Bisulcis*, and *de Piscibus*; and Ray, whose *Synopsis Animalium Quadrupedum*, &c. gave elevation to the science by the fervour of piety which distinguishes this as well as all his other valuable works. The eighteenth century is the era of Linnæus, who far surpassed all in the variety and extent of his researches, in the exactness of his discriminations, and in his just appreciation of systematic arrangement. The eloquence, and perhaps the rank, of



Comte de Buffon contributed to give popularity to the science, and led the way to a host of enlightened and profound explorers of nature. Gratitude for the aid of their writings, in the arrangement of the animals in this Museum, demands the special mention of Cuvier, Lamarck, Blumenbach, Latreille, and Illiger; of Pennant, Shaw, and Leach. Personal kindness, conveying valuable information, requires due acknowledgment to sir Stamford Raffles<sup>a</sup>, Mr. Burchell, Mr. Kirby, and Mr. Vigors. But the friendship of Drs. Kidd, Buckland, and Williams, have sustained the arranger of the restored Tradescantian collection with especial aid. Their researches have expedited investigation, and their highly valued approbation stimulated to perseverance.

As the book of Aristotle, ΠΕΡΙ ΖΩΩΝ, has been more than once mentioned with due honour, for his acuteness of investigation and accuracy of discrimination—the more wonderful because he appears to have had no predecessor in the pursuit—it seems but just to the professor of comparative anatomy, Dr. Kidd, to state, that to him belongs the honour of instituting an important comparison between the valuable observations of Cuvier, the more estimable because supported by his profound anatomical research, and the sagacious anticipations of Aristotle.

A translation of some of the introductory sections of that book, having been opportunely sent as a present to the Museum, is subjoined, as well suited to illustrate the preceding remarks. It has been made by the Rev. Jas. Pears, A. B. of Magdalen college, now engaged with his father as an assistant in the city grammar school at Bath. It is hoped that the

<sup>a</sup> Society and science have lost a dignified and highly estimable friend by the death of sir S. R. while these pages were in the press.



whole work will one day be presented to the English reader, illustrated by the correct erudition and science of Dr. Kidd.

The study of natural science would undoubtedly derive much advantage from the adoption of some common language from which the nomenclature should be derived, or at least of some plain and common rules, according to which it should be constructed. If it be desirable that words should readily suggest ideas, they should be as familiar as the novelty of any object will admit; drawn from a language not generally unknown, and rather from one than from many. But less familiar names may be preferable to the more familiar, if the former are descriptive or definitive, and the latter without such tendency to assist the association of ideas. Thus the term *mammifera* may be preferable to that of *beasts*, as excluding reptiles. The Romans adopted many Greek names, which may now be regarded as Latin, from such naturalization, as *amphibia*. This presents no anomaly in a Latin list like *pachydermata*. But terms which blend the two languages without any necessity, as *monoculus*, should be proscribed. It is desirable to preserve old names as synonymous, and indeed not to adopt new names for known objects, except for the sake of consistent uniformity or of descriptive accuracy. New names required for new objects should be as simple as nearly accordant with the general plan of nomenclature, and as harmonious as may be consistent with descriptiveness.

These preliminary hints may be best illustrated by an exhibition of some of the primary tables, viz. of the classes and orders of the most eminent modern naturalists; and such view, however imperfect, can-



not be unuseful, if it shall only direct attention to valuable authors, whose works many who may cast a cursory glance over the Catalogue may not have before noticed.

## A LINNÆAN ARRANGEMENT OF ORDERS.

## MAMMALIA.

First Division.—*With true feet.*

<i>Orders characterized by teeth.</i>			<i>Types.</i>
Order 1.	Primates.	4 incisors.	Man. Monkey tribes.
2.	Bruta.	No incisors.	Elephant. Bradypus.
3.	Feræ.	6 incisors.	Lion. Dog.
4.	Glires.	2 incisors.	Hare. Rat.
5.	Pecora.	No incisors in upper jaw.	Bull. Deer.
6.	Belluæ.	6 obtuse fore-teeth.	Horse. Zebra.

Second Division.—*With feet like fins.*

7.	Cete.	Teeth various.	Whale. Dolphin.
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## BLUMENBACH'S ARRANGEMENT.

## Orders characterized by hands and feet—Families by teeth.

<i>Orders.</i>		<i>Type.</i>	<i>Linnæan Orders.</i>
<i>Animalia.</i>			
1. Bimana	With 2 hands	Man.	} Primates.
2. Quadrumana	4 hands	Moukeys.	
3. Cheiroptera	Fore-feet expanded into wings	Bats.	
4. Digitata	Fore-feet with unconnected toes 3 families distinguished by teeth, as in Linnæan orders		} Feræ. Glires. Bruta. (omitting the elephant)
Carnivora	Feræ, 6 incisors, large canine	Lion.	
Rodentia	Glires, 2 incisors, no canine	Hare.	
Edentata of Cuvier	Bruta, without incisors	Sloth.	
5. Solidungula.	With undivided hoofs.	Horse.	Belluæ.
6. Bisulca.	{ With cloven hoofs, all ruminators.	{ Bull. Camel. Giraffe.	} Pecora.
7. Multungula.	{ More than 2 hoofs on each foot, thick skinned.	{ Elephant. Hog.	
8. Palmata.	{ With feet formed for swimming. 3 families distinguished like those of digitata. 1. Feræ—Otters, seals. 2. Glires—Beavers. 3. Bruta—Walrus.	{ Otters Seals, &c.	} Feræ, Glires, and Bruta.
9. Cetacea. (Natautia of Illiger.—For uniformity we should say Pinnata.)	Feet approaching to fins.	Whales.	Cete.

This division of orders is consistent throughout. The characters are prominent to observation. It



separates the dissimilars in habit more conspicuously than that of Linnæus; and is for these reasons better suited to a Museum.

It is for the same reasons preferred to that of Cuvier, which however points to many important distinctions developed by the sagacity and industry of that great anatomist.

### CUVIER'S ARRANGEMENT.

<i>Divisions.</i>	<i>Animals.</i>	<i>Classes.</i>
With vertebræ.	Warm blood, heart with 2 ventricles.	Viviparous, with mammæ. } 1. Mammalia.
		Oviparous, no mammæ. } 2. Aves.
	Cold blood, heart with 1 ventricle.	Lungs often with branchiæ. } 3. Reptilia.
		Branchiæ, without lungs. } 4. Pisces.
Without vertebræ.	Blood vessels and nerves.	A simple spinal marrow. } 5. Mollusca.
		No articulated members. } 6. Vermes.
	No blood vessels.	A knotted spinal marrow. } 6. Vermes.
		No articulated members. } 7. Crustacea.
	No nerves.	Knotted spinal marrow with articulated members. } 7. Crustacea.
		Ditto. } 8. Insecta.
	No spinal marrow. No articulated members.	} 9. Zoophyta.

### ORDERS—OF MAMMALIA.

	<i>Teeth.</i>	<i>Other characters.</i>
1. Bimana.	{ 3 sorts, incisors, canine, and grinders; lower incisors erect. }	Form erect. Great toes longer than others—moveable but in one direction. Chin projecting. Three lobes to the brain. Nails flat.
2. Quadrumana.	{ Ditto lower incisors projecting. }	Thumbs to hind-feet—shorter than the fingers or toes—moveable in an opposite direction. Nails flat, but elongated.
3. Sarcophaga or Carnivora.	{ No horizontal movement to the lower jaw. Grinders with conical points. Canine teeth long, but not very different from the former orders. }	No separate toe or thumb on the fore-feet, and the claw behind never opposable by others. Nails sharp and hooked. Only two lobes to the brain.
4. Rodentia.	{ No canine teeth. }	Articulation of lower jaw longitudinal, to move only backwards and forwards.
5. Edentata.	{ No incisors. }	Large elongated nails, less sharp and less hooked than claws of Carnivora.



6. Pachydermata.	{ Teeth various.	{ Hoofs and immoveable fingers or toes. One toe and one hoof, or more than two hoofs.
7. Rumipantia.	{ No incisors in the upper jaw.	{ Forked feet, two hoofs and two toes.
8. Cetacea.	{ Various.	{ Anterior extremities having analogy with feet, but enveloped in membrane like fins. Tail terminating in a strong horizontal fin.

## ILIGER'S ARRANGEMENT.

This system is founded on much curious observation of characteristic differences: some are of form, and some of habit. Hence the scheme is less uniform, and less suited to exhibition than that of Blumenbach. The outline is as follows—

Two divisions.	{ A. Feet exterior: distinct.
	{ B. Feet with the upper parts entirely within the body, the extremities enveloped in skin. Hind-feet turned backwards, forming a tail, or wanting.

Orders. A.

1. *Erecta*.—The hand only with an opposable thumb. Upright walk. Entire sole of the foot set to the ground in walking.—*Type, Man.*
2. *Pollicata*.—Hind-feet always and fore-feet generally with opposable great toes.—*Type, Simia, Orang.*
3. *Salientia*.—No distinct great toes. Feet for springing. Toes with hooked nails; two on the hind-feet united. An abdominal pouch. Six or eight incisors above. Canines wanting or doubtful. Grinders laminar.—*Type, Didelphys, Opossum.*
4. *Premsiculantia*.—Toes with hooked nails, sometimes with large nails enveloping both sides of the foot like small hoofs. Two incisors, and a void interval in place of canines. Grinders simple, complicated or laminar.—*Type, Dipus, Jerboa, Squirrel, Marmot.*
5. *Multungula*.—Feet with three or five flat nails. Incisors and canines various; one or the other generally wanting. Grinders complicated or laminar.—*Type, Elephas, Sus.*



6. *Solidungula*.—Feet with one entire nail. Grinders abrupt.—*Type, Equus.*
7. *Bisulca*.—Feet bifurcated or sub-bifurcated (as in camels). No upper incisives to the bifurcated; a few to the sub-bifurcated. Six or eight lower incisors to both. Grinders abrupt, complicated.—*Type, Camelus, Giraffa, Cervus, Bos.*
8. *Tardigrada*.—Toes with hooked nails. No incisors. Canines solitary. Grinders simple.—*Type, Bradypus.*
9. *Effodientia*.—Toes with hooked nails approaching to flat. No incisors or canines. Grinders either smooth, fibrous, or a toothless bone.—*Type, Dasypus, Armadillo.*
10. *Reptantia*.—Toes with hooked nails. No teeth, or teeth without roots. No mammæ. A cloaca.—*Type, Echidna, Ornithorynchus.*
11. *Volitantia*.—Toes with hooked nails. Flying membrane from the fore to the hind-feet, proceeding from the sides of the body, and interfemoral, i. e. connecting the hind-legs and joining the anus. Incisors, canines, and simple grinders.—*Type, Colugo, Vespertilio.*
12. *Falculata*.—Toes with hooked nails. Feet for walking or digging, or palmated. Upper parts of legs almost within the body; the extremities nearly enveloped in skin. The hind-feet lateral. Incisors, canines, and simple grinders.—*Type, Erinaceus, Hedge-hog, Weasel, Felis, Leo, Hyæna, &c. and Polecat, Sorex, Canis.*

## B.

13. *Pinnipedia*.—Feet palmated. Hind-feet distinct, and turned backwards.—*Type, Phoca, Seal, Walrus.*
14. *Natantia*.—Hind-feet within the tail, or none. Fore-feet reduced, and enveloped like fins.—*Type, Balæna, Whale, Delphinus.*

Dr. Fleming, minister of Flisk, Fifeshire, in a very useful work, *The Philosophy of Zoology*, has proposed an arrangement on exact principles of difference and accordance, most interesting to the investigator, but not convenient for exhibition to cursory observers and novices.



Dividing animals into vertebral and invertebral, he assorts the vertebral into warm-blooded (which we might name *calidisanguia*) and cold-blooded (*gelidisanguia* <sup>g</sup>). The *calidisanguia* are quadrupeds and birds; the *gelidisanguia* reptiles and fishes. Quadrupeds he proposes to divide into two subdivisions; *mammalia*, giving milk to their young, and *monotremata*, having one passage, like birds, for secretion and parturition. (Perhaps *ovipara* might be a preferable name.) *Mammalia* he again divides, from conditions connected with parturition, into *placentaria*, or animals perfected in the uterus by means of the nutriment obtained from the placenta, and *marsupialia*, or animals requiring after birth the subsequent protection of the marsupium or pouch, as in the opossum tribe. These he again subdivides into *pedata* and *apoda*. *Pedata* includes *unguiculata* and *ungulata*. The division *unguiculata* includes *bimana*, *quadrumania*, *cheiroptera*, *feræ*, *plantigrada*, *digitigrada*, *palmata*, having tusks or canine teeth, and *glires*, wanting tusks. The division *ungulata* includes *pecora* and *belluæ*. The *apoda* are divided into *herbivora* and *cetacea*.

M. Latreille, in a late published work, (1825,) says,

“ Je partage les animaux en trois grands séries.  
 “ 1°. Les vertébrés, *vertebrata* ou *spini-cerebraux*.  
 “ 2°. Les céphalidiens, *cephalidia*, que l'on distingue  
 “ plus communément aujourd'hui sous le nom d'in-  
 “ vertébrés—et 3°. Les acéphales, *acephala*. Les  
 “ premiers sont intelligens; les seconds, instinctifs;  
 “ les troisièmes et derniers, automatiques.

<sup>h</sup> *Gelidus* is opposed to *calidus* by Juvenal—“ *Calidæ gelidæ-que minister.*” SAT. V. 63.



## “ VERTEBRES.

“ Première Race. Hémathermes—Hæmatherma.

“ Première Classe. Mammifères—Mammifera.

“ Première Section. Quadrupèdes—Quadrupeda.

“ Première Division. Onguiculés—Unguiculata.

“ Premièrement Ordre. Bimanes—Bimana.

“ Les extrémités antérieures se terminent seules  
 “ par une main, ayant le pouce libre et opposable aux  
 “ autres doigts ; les doigts des extrémités postérieures  
 “ sont sur la même ligne, avec le pouce gros et le  
 “ plus long de tous. Le corps est naturellement  
 “ vertical. L'homme, propre, par son intelligence a  
 “ la civilisation, aux arts, aux sciences, et pouvant  
 “ vivre dans tous les climats. Races pures, Cauca-  
 “ sique, Mongolique, Ethiopique.

“ 2<sup>d</sup> Ordre. Quadrumanes—Quadrumana. 2 familles ; 1. Simiæ.  
 et 2. Lemurini.

“ 3<sup>me</sup> Ordre. Cheiroptères—Cheiroptera. 3 familles ; 1. Pleuro-  
 ptera. 2. Meganyctera. 3. Vespertiliones.

“ 4<sup>me</sup> Ordre. Carnassiers—Feræ. 2 familles ; 1. Insectivora. 2.  
 Carnivora.

“ 5<sup>me</sup> Ordre. Amphibies—Amphibia. 2 familles ; 1. Cynomorpha.  
 2. Brocha<sup>h</sup>.

“ 6<sup>me</sup> Ordre. Marsupiaux—Marsupialia. 3 familles ; 1. Entomo-  
 phaga. 2. Carpophaga. 3. Phyllophaga.

“ 7<sup>me</sup> Ordre. Rongeurs—Glires. 8 familles ; 1. Sciurini. 2. Ar-  
 ctomydes, Marmot. 3. Talpiformes. 4. Murini. 5. Natatorii,  
 Castor. 6. Hystricosi. 7. Leporini. 8. Dasypoides.

“ 8<sup>me</sup> Ordre. Edentés—Edentata. 2 familles ; 1. Brevirostres,  
 Bradypus. 2. Longirostres, Pangolia.

“ 9<sup>me</sup> Ordre. Pachydermes—Pachyderma. 4 familles ; 1. Penta-  
 dactyla, Proboscidea. 2. Tridactyla, Tapir, Rhinoceros. 3.  
 Fissipedes, Babeyroussa, Sus. 4. Solipedes.

“ 10<sup>me</sup> Ordre. Ruminans—Pecora. 2 sections. 3 familles ; 1.  
 Inermia, Lama. 2. Plenicornia, Cervus. 3. Tubicornia, Bos.  
 2<sup>de</sup> section. Bipedes, Pinnipedia.

<sup>h</sup> Pliny has the word *brochitas* for crookedness of tusks.



“ 1<sup>re</sup> Ordre. Cétacés—Cetacea. 2 familles; 1. Herbivora, Manati. 2. Hydraula, Balæna.

“ 2<sup>de</sup> Classe. Monotrèmes—Monotrema.

“ 1<sup>er</sup> Ordre. Macroglossa—Echidna.

“ 2<sup>d</sup> Ordre. Pinnipedia—Ornithorynchus.

“ 3<sup>me</sup> Classe. Oiseaux—Aves.

“ 4<sup>me</sup> Classe. Poissons—Pisces.”

The praise due to Dr. Fleming's arrangement, and the difficulty of adopting it for limited exhibition, applies in a yet greater degree to the more complicated classification of Mons. Latreille. His names are derived from Greek and Latin at random, and are Gallicised in all divisions.

Having previously alluded to the very interesting analytical Tables of Mons. de Blainville, the object of this Introduction will be duly promoted by the presentation of a part at least of these minute subdivisions to the notice of the English student.



## TABLE SYNOPTIQUE DES SUBDIVISIONS.

Primaires (Sous-Règne),  
Secondaires (Type),

Tertiaires (Sous-Type),  
et Quaternaires (Classes),

## DU REGNE ANIMAL.

## I. Sous-Type.

mamelles et ..... de poils.....

Vivipares.

## II. Sous-Type.

sans mamelles,  
Ovipares

pourvus de .....

## Type I.

intérieurement.  
Ostéozoaires.

plumes. ....  
écailles. ....  
peau nue. ....  
nageoires. ....  
de 3 paires. ....  
de 4. ....  
de 5. ....  
variable.....  
de 7. ....  
= aux anneaux.

articulés au nombre

non articulés.....  
nuls. ....

Type II.

extérieurement.  
Entomozoaires,  
ou A. articulés,  
à appendices..

Type III.

sub-articulés.  
Malentozoaires ou Molluscarticulés .....

Type IV.

Malacozoaires..... La tête.....  
A. Mollusques. { distincte.....  
{ non distincte. ....

sub-articulés.  
Actinozoaires ou Actinozoaires.....

vrais. ....

Sous-Règne.  
paire ou A.  
Artiomorphes.  
Artiozoaires.

Sous-Règne.  
rayonnée ou A.  
Actinomorphes ou Actinozoaires.....

Sous-Règne.  
irrégulière ou A.  
Hétéromorphes ou Hétérozoaires. ....

I. Pilifères ou Mammifères.

II. Pennifères ou Oiseaux.

III. Squammifères ou Reptiles.

IV. Nudipellifères ou Amphibiens.

V. Pinnifères ou Poissons.

VI. Hexapodes.

VII. Octopodes.

VIII. Décapodes.

IX. Hétéropodes.

X. Tétradécapodes.

XI. Myriapodes.

XII. Chétopodes.

XIII. Apodes.

XIV. Nématopodes.

XV. Polyplaxiphores.

XVI. Céphalophores.

XVII. Acéphalophores.

XVIII. Annelidaires.

XIX. Cératodermes.

XX. Aracnodermes.

XXI. Zoanthaires.

XXII. Polypiaires.

XXIII. Zoophytaires.

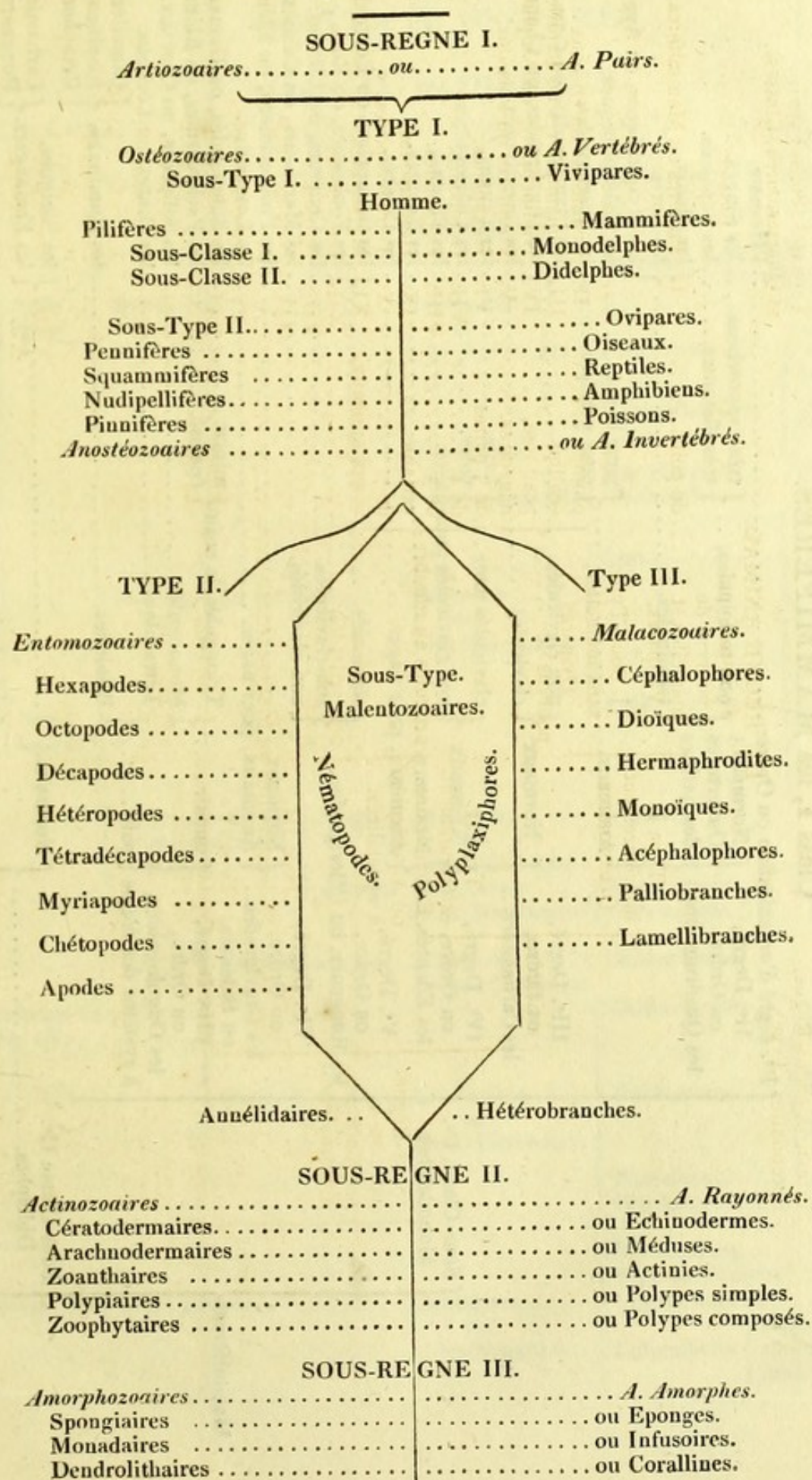
XXIV. Spongiaires.

XXV. Monadaires ou Moléculaires.

XXVI. Dendrolithaires.



Tableau indiquant comment la série des animaux se fait des Ostéozoaires aux Actinozoaires, par une double ligne des A. invertébrés.





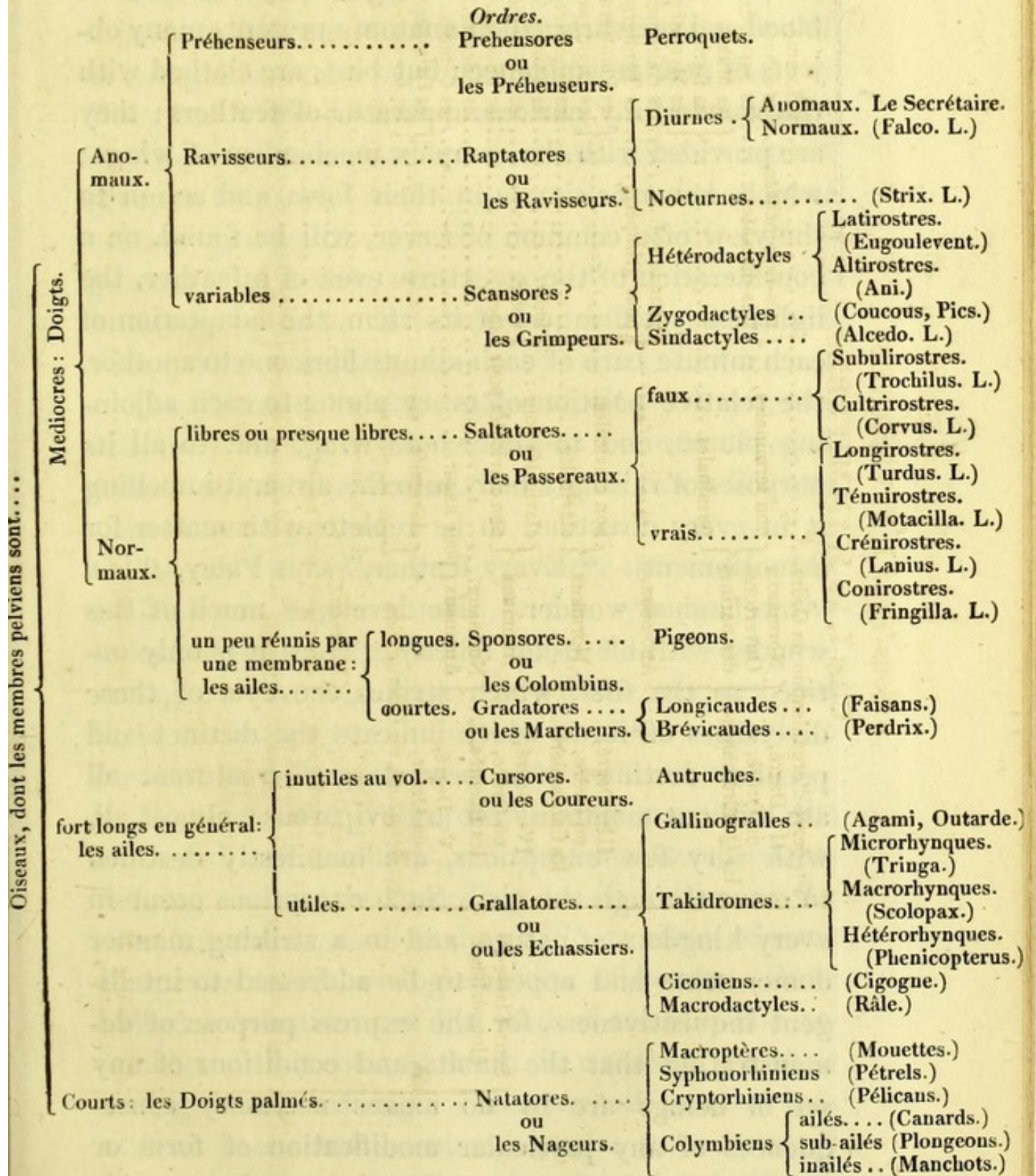




## Type I. OSTEOZOAIRES.

## Sous-Type II. OVIPARES.

## Classe II. les OISEAUX.





The arrangement of birds presents at least as many difficulties as that of beasts. The two great classes of living beings possess indeed some striking affinities; they have similar or analogous organs of sense; they breathe with lungs; they have warm blood and vertebræ; their anatomy presents many objects of near resemblance: but birds are clothed with the wonderfully curious apparatus of feathers; they are provided with the complex mechanism of wings; which, however simple in their form and action to the view of a common observer, will be found, on a consideration of the structure even of a feather, the lightness yet firmness of its stem, the adaptation of each minute barb of each minute fibre one to another, the relative position of every plume to each adjoining plume, and to the whole wing, and to all its purposes of raising a body into the air, and impelling it in every direction, to be replete with matter for astonishment. "Every feather," says Paley, "is a mechanical wonder." He develops much of this wonder with his usual felicity. Here it is only noticed as the first, which strikes the eye, of those diversities of form, which indicate the distinct and peculiar destinies of a new class of creatures: all are without mammæ; all are oviparous; almost all, with very few exceptions, are manifestly destined to move through the air. Such exceptions occur in every kingdom of nature, and in a striking manner demonstrate and appear to be addressed to intelligent inquisitiveness, for the express purpose of demonstrating that the habits and conditions of any set of beings are by no means necessary consequences of any particular modification of form or combination of substance. One plant produces acrids



where another produces acids or sweets: feathers are to most birds instruments nicely adapted to flight, but not to the Cassowary, the Ostrich, and the Penguin.

But between birds and mammiferous animals there are important affinities and analogies, which afford guidance to the arranger of natural objects. The former are divisible according to their general destination, like mammiferous animals, into two great groupes, terrestrial and aquatic. A middle or connecting groupe, the waders, will be readily distinguished: like beasts, some live chiefly on animal food, some on vegetable. The aquatic, almost wholly, yet with partial exception, upon fish and mollusca.

The forms of beaks, legs, and claws very generally indicate their food and habits; wings also contribute to such indication, and afford bases for systematic arrangement.

To avoid the expansion of a mere introduction to a Catalogue into a volume, a few synopses of the orders of birds, according to some of our latest ornithologists, are subjoined. It will be obvious that little more is here intended, than to suggest to novices the more prominent objects of attention.

A sketch of a Table of the class pennifera, the feathered race, or birds, will be first attempted, arranging the orders according to diversities in the conspicuous organs of feeding. These admit of some comparison with analogous parts of beasts. Birds indeed are destitute of lips and of teeth. The resemblance of beaks to teeth is remote; yet their analogies are striking. Birds are all, more or less, at least occasionally, animalivorous: some however seem to prefer the grains, some the pulpy fruit, and



some even the leaves of plants. The hooked and notched beaks of carnivorous birds, accompanied with hooked and strong talons, suggest their slaughterous propensities, no less than the large canine teeth and similar talons of the beasts of prey. The beaks of parrots have some analogy with the incisive teeth of the rodentia; the tongues of woodpeckers have some correspondence with those of the anteaters; the beaks of ducks with the mouths of several herbivorous quadrupeds. The forms however of beaks are so various, and so remarkably indicative of peculiar destinations and habits, that these will be experimentally selected as the characteristics of orders, or of the secondary arrangement, subordinate to the first grand division of the whole class into terrestrial and aquatic. *See the Table of Beaks and Synopsis of Ornithological Arrangements.*



The object of the preceding pages being merely to illustrate the principles upon which arrangement has been, and on which it should be conducted, the comparative Tables need not be extended into the classes amphibia, &c. It may suffice, as merely introductory to the Catalogue, to notice the divisions of Blumenbach, in whose Manual of the Elements of Natural History references will be found to all the best writers on these subjects.

## CLASS III. AMPHIBIA.

## ORDER I.

With four feet.

*Reptiles.*

1. Testudo.
2. Rana.
3. Draco.
4. Lacerta.

## ORDER II.

Without feet.

*Serpents.*

1. Crotalus—Crepitaculum.
2. Boa—Scuta subcaudalia.
3. Coluber—Squamæ subcaudales.
4. Anguis—Squamæ abdominales et subcaudales.
5. Amphisbæna—Annuli, trunci et caudæ.
6. Cæcilia—Rugæ et trunci et caudæ. Labrum superius tentaculis binis.

## CLASS IV. BRANCHIALIA—FISH.

Orders 1. *Chondropterygii*. With no operculum for gills, as the lamprey.

2. *Branchiostegi*. With opercula to the gills. *Sturgeons*.
3. *Apodes*. Without ventral fins. *Eels*.
4. *Jugulares*. With ventral in front of the pectoral fins. *Cod, pipers*.
5. *Thoracici*. Ventral below pectoral fins. *Turbot, perch*.
6. *Abdominales*. Abdominal behind the pectoral fins. Most fresh-water fish are of this order, as well as very many sea fish. *Sprat, salmon, smelt, carp, &c.*

## INSECTA.

Comparative Tables of every system worthy of notice are to be found, illustrated by one who “to his reading brings a spirit and judgment equal or “superior” to all on whom he comments, in the



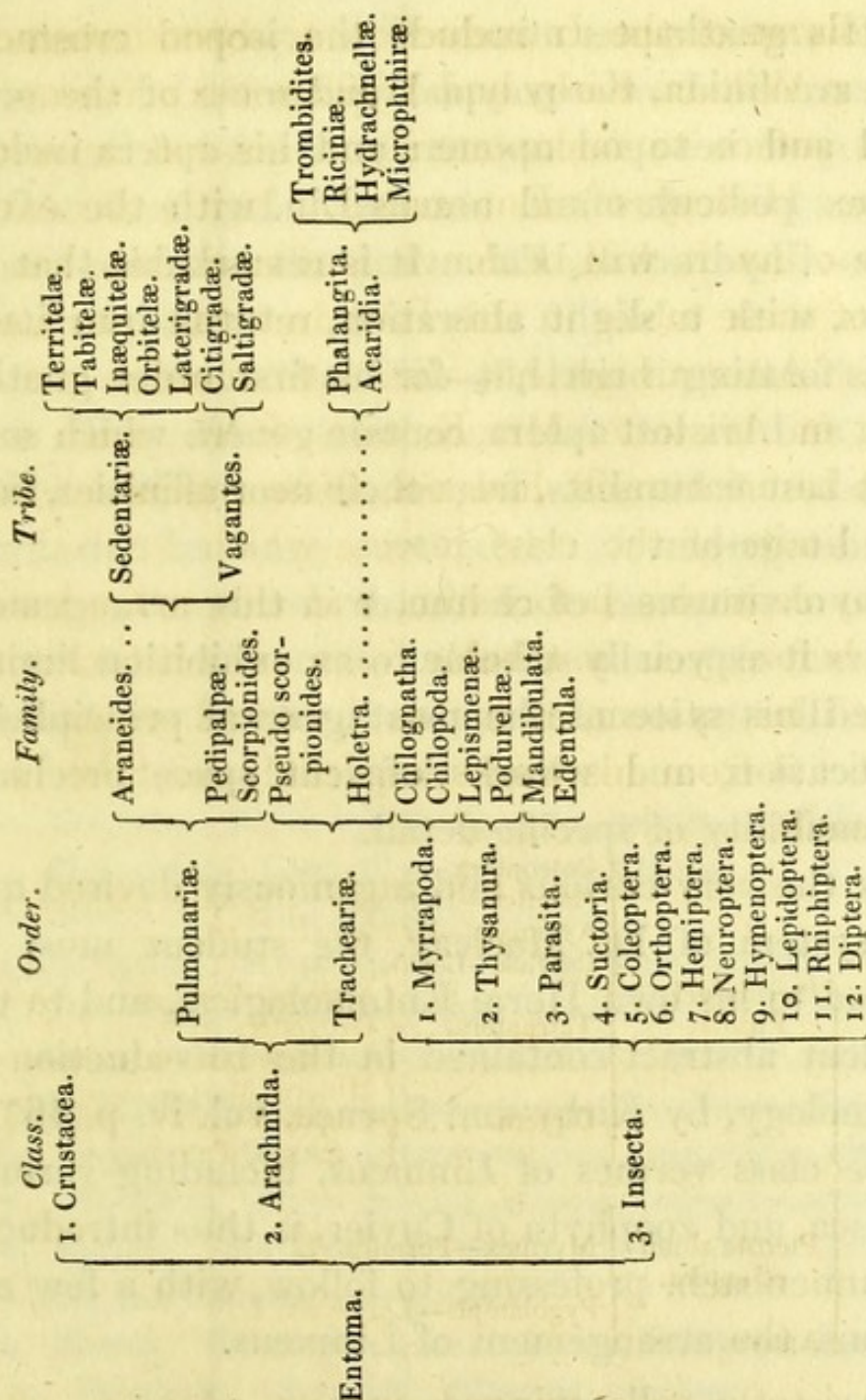
last volume of the Introduction to Entomology, by the rev. William Kirby and William Spence, esq. It might suffice to make merely a general reference to the History of Entomology, Letter XLVIII. vol. iv.; but it will be convenient to include two at least of these tables in this Introduction to our Catalogue. After a high but due encomium on the sagacity of Aristotle, Mr. K. adds, “ We have seen “ that Linné himself had not those precise ideas of “ the limits of the class insecta which Aristotle, so “ many centuries before him, had adopted. I shall “ lay before you a tabular view of what may be “ called his system, as far as I have been able to “ collect it from his works, especially his History of “ Animals.

Insecta.	{	Pterota vel Ptilota.	{	Coleoptera.
				Pedetica—Orthoptera saltatoria. Latreille.
				Astomata—Hemiptera. Latr.
				Psychæ—Lepidoptera.
	{	Tetraptera. . .	{	Majora—Neuroptera. Linn.
				Orthoptera cursoria. Latr.
				Opisthocentra—Hymenoptera.
				Minora, Musca, Tipula, &c.
	{	Diptera. . . . .	{	Emprosthocentra, Culex, Stomoxys, Tabanus, &c.
	{	Pterota simul et aptera.	{	Myrmex—Formica. L.
				Pygolampis—Lampyrus. L.
	{	Aptera.		

“ Aristotle calls winged insects *pterota*, when “ he would distinguish them from those which are “ apterous; and *ptilota*, when he contrasts them “ with birds. Sometimes he calls birds thus con- “ trasted *schizoptera*, and insects *holoptera*.”

Mr. Kirby says of Latreille, “ His brilliant genius, “ his indefatigable labours, and singular talents, have “ thrown more light over entomological science than “ those of all his predecessors. Of what he has effect- “ ed the subjoined Table will give a sufficient idea.”





“ Mr. Cuvier, in his *Anatomie Comparée*, (1805,) divided insecta into two subclasses, from the presence or absence of maxillæ: thus—

*With Maxillæ.*

1. Gnathaptera.
2. Neuroptera.
3. Hymenoptera.
4. Coleoptera.
5. Orthoptera.

*Without Maxillæ.*

1. Hemiptera.
2. Lepidoptera.
3. Diptera.
4. Aptera.



“ His gnathaptera include the isopod crustacea, “ the arachnida, the polypod, and some of the octo-  
 “ pod and hexapod aptera: and his aptera include  
 “ pulex pediculus and acarus Lin. with the exclu-  
 “ sion of hydrachna, Fab. It is remarkable that his  
 “ class, with a slight alteration, returns into itself,  
 “ thus forming a circle,”—for his first order gnatha-  
 ptera, and his last aptera, contain genera which some  
 of the best naturalists, from their near affinities, have  
 classed together.

The obviousness of character in this arrangement renders it especially suitable to an exhibition limited to the illustration of the most general principles of classification, and where deficient space precludes the possibility of specific detail.

For the very curious and ingeniously devised quinary system of Dr. Macleay, the student must be referred to his own *Horæ Entomologicæ*, and to the excellent abstract contained in the Introduction to Entomology, by Kirby and Spence, vol. iv. p. 467.

The class vermes of Linnæus, including vermes, mollusca, and zoophyta of Cuvier, is thus introduced by Blumenbach, professing to follow, with a few exceptions, the arrangement of Linnæus.

Order 1. *Intestina*. Long worms without any evident external organs of motion.

2. *Mollusca*. Naked, soft worms without any evident external organs of motion.

3. *Testacea*. Animals inhabiting shells.

4. *Crustacea*. Animals having almost cartilaginous bodies; in some cases with a firm or calcareous crust, as sea-urchins, sea-stars, &c.

5. *Corallia*. Polypes inhabiting coral branches.

6. *Zoophyta*. Naked plant like animals, without habitations; also animalculæ of infusions.



Of these, it may suffice to notice particularly the testacea, exhibiting, in consonance with the proposed object of this sketch, a synopsis of the arrangements of Linnæus and Lamarck, from the elegant and useful manual, the *Index Testaceologicus*, of Mr. Wood, 1825.

A mere list of corallia and zoophyta is subjoined from Blumenbach's *Manual of Natural History*. "The animals of these two orders," he observes, "coincide in many particulars: the zoophyta, however, are uncovered, and have the power of locomotion; the corallia inhabit immovable dwellings, which are for the most part of a stony consistence.

1. *Tubipora*. Tubis cylindricis, cavis, erectis, parallelis.
2. *Madrepora*. Cavitatibus lamelloso-stellatis.
3. *Millepora*. Poris turbinatis teretibus.
4. *Cellepora*. Foraminulis urceolatis, membranaceis.
5. *Isis*. Stirps radicata solida, cortice molli habitabili obducta. *Isis nobilis* is the red coral of commerce, collected in the Mediterranean, and manufactured at Naples, &c.
6. *Gorgonia*. Crusta calcarea, stirpem vegetabilem obducens.
7. *Alcyonium*. Stirps radicata, stuposa, tunicato-corticata.
8. *Spongia*. Stirps radicata flexilis, bibula. Adhuc est subjudice an sit animal an vegetabile.
9. *Flustra*. S. radicata foliacea, poris cellulosi undique tecta.
10. *Tubularia*. S. radiata, filiformis, tubulosa.
11. *Corallina*. S. geniculata, filamentosa, calcarea.
12. *Sertularia*. Stirps radicata, tubulosa, cornea, nuda, articulata: dentibus calyciformibus obsita.
13. *Cellularia*. S. crustacea lapidescens, e cellulis seriatis composita, ramosa, et articulata, tubulis adhærens.

#### ZOOPHYTA.

1. Pennatula. 2. Hydra. 3. Brachionus. Blossom-polype. 4. Vorticella. 5. Furcularia. 6. Vibrio. 7. Volvox. 8. Infusoria."

See Ellis's very excellent *Natural History of Corallines*.



Of anatomical, mineralogical, chymical, geological, or botanical arrangements, any notice would be here superfluous; as these belong to separate provinces, subject to professors, eminently learned and skilful, to display them.

Finally, if there be any use in this slight survey of the arrangement of the animal kingdom, it is hoped that it may at least produce this conviction on minds to which the subject may be nearly new; that however imperfectly even the most sagacious investigator may be able to trace the great scheme of the universe, yet, that in every part the marks of design, the impress of the great Designer, may be discovered, may be pointed out: that an attempt to trace any part of the plan of perfect wisdom cannot be an unwholesome exercise to that intelligence, which reason and revelation equally shew to be derived from the same source with the order of the visible creation; and for the amelioration and exaltation of which intelligence, that order of diversities, bounded and linked together by similitudes, (amongst other causes, doubtless beyond the reach of man's inquiry,) appears to have been wonderfully constituted and exactly harmonized.

Linnaeus thus introduces his *Systema Naturæ, secundum Classes, Ordines, Genera, Species, cum Characteribus, Differentiis, Synonymis, Locis*. Holmiæ, 1766.

“ Tanto igitur magis nosse naturam operæ præ-  
 “ tium, quo nullum majus est! neque enim quidquam  
 “ habet in se hujus materiæ tractatio pulchrius, dum  
 “ multa lateant futura usui, quam quod hominem  
 “ magnificentia sui detinet, nec mercede, sed mira-  
 “ culo colitur! Quota enim pars operis tanti nostris



“ oculis committitur, et quam multa, præter hæc  
“ quæ vidimus, in secretum eunt nunquam humanis  
“ oculis orientia; neque enim omnia Deus humanis  
“ oculis nota fecit. Multa etenim sunt quæ esse  
“ audivimus, qualia autem sint ignoramus! Quam-  
“ que multa hoc primum cognovimus sæculo! et  
“ quidem multa venientis ævi populus, ignota nobis,  
“ sciet! multa sæculis tunc futuris, cum memoria  
“ nostri exoleverit, reservantur! veniet tempus, quo  
“ ista quæ nunc latent, in lucem dies extrahat et  
“ longioris ævi diligentia.—Involuta veritas in  
“ alto latet. ‘ Si in hoc juvenus sobria, sui Crea-  
“ toris memor, incumberet, si hoc majores doce-  
“ rent et hoc minores addicerent, vix tamen ad  
“ fundum veniretur, in quo veritas posita est, quam  
“ nunc in summa tellure, et levi manu quærimus <sup>a</sup>.’ ”

<sup>a</sup> Seneca, Nat. Quæst. lib. vii. ad finem.







# SYNOPTICAL VIEW OF ORDERS

IN

## DIFFERENT ARRANGEMENTS OF THE CLASS MAMMALIA.

BLUMENBACH.	CUVIER.	ILIGER.	LINNÆUS.
1. Bimana.	Bimana. 1. Blumenbach.	Erecta. { 1. Blumenbach and Cuvier.	Primates. { 1. 2. 3. Blumenbach. 1. 2. Cuvier. 1. 2. 11. Iliger.
2. Quadrumana.	Quadrumana. 2. Blumenbach.	Pollicata. { 2. Blumenbach and Cuvier.	Bruta. { 7. and part of 4. Blumenb. 7. Cuvier. 8. Iliger.
3. Cheiroptera <sup>a</sup> .	Sarcophaga <sup>b</sup> . 3 and 4. Blumenbach.	Salientia. { Part of 4. Blumenbach, and 3. Cuvier.	Feræ. { 4. Blumenbach. 3. Cuvier. 12. Iliger.
4. Digitata <sup>c</sup> .	Rodentia. Part of 4. Blumenbach.	Prensiculantia. { 4. Blumenbach, and part of 3 and 4. Cuvier.	Glires. { 4. Blumenbach. 4. Cuvier. 3, and 4, and 9. Iliger.
5. Solidungula.	Pachydermata. 5 and 7. Blumenbach.	Multungula. { 7. Blumenbach, and 5. Cuvier.	Pecora. { 6. Blumenbach. 6. Cuvier, and 7. Iliger.
6. Bisulca.	Ruminantia. 6. Blumenbach.	Solidungula. { 5. Blumenbach, and 5. Cuvier.	Belluæ. { 5. Blumenbach. Part of 5. Cuvier. 5. Iliger.
7. Multungula.	Edentata. Part of 4. Blumenbach.	Bisulca. { 6. Blumenbach, and 6. Cuvier.	Cete. { 8 and 9. Blumenbach. 8. Cuvier. 13 and 14. Iliger.
8. Palmata.	Cetacea. 8 and 9. Blumenbach.	Tardigrada. { 4. Blumenbach, and 7. Cuvier.	
9. Cetacea.		Effodientia. { 4. Blumenbach, and 7. Cuvier.	
10.		Reptantia. { 4. Blumenbach, and 7. Cuvier.	
11.		Volitantia. { 3. Blumenbach, and 3. Cuvier.	
12.		Falculata. { 4. Blumenbach, and 3. Cuvier.	
13.		Pinnipedia. { 8. Blumenbach, and 8. Cuvier.	
14.		Natantia. { 9. Blumenbach, and 8. Cuvier.	

<sup>a</sup> For "Cheiroptera" adopt "Alimana" for uniformity of derivation.

<sup>c</sup> For "Digitata" adopt "Uncidigitata," because the Quadrumana have Digits, but not hooked nails. "Falculata," the name used by Iliger, would suit; but it fits the Feræ better than the Glires of Linnæus. There are three families of Digitata, viz. the Sarcophaga, Rodentia, and Edentata of Cuvier; and the Feræ, Glires, and Bruta of Linnæus.

<sup>d</sup> 10. Reptantia of Iliger, and the Groupe Monotrema of Cuvier, consisting of Echidna and Ornithorynchus, were not known to Linnæus, and therefore do not enter into his Arrangement.

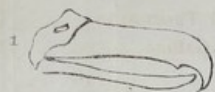
<sup>b</sup> Four families; viz. 1. Cheiroptera. 2. Insectivora. 3. Carnivora. 4. Didelphys.



CHURCH	BAPTIST CHURCH
1. Baptists	Baptists
2. Quakers	Quakers
3. Presbyterians	Presbyterians
4. Episcopalians	Episcopalians
5. Methodists	Methodists
6. Lutherans	Lutherans
7. Unitarians	Unitarians
8. Catholics	Catholics
9. Jews	Jews
10. Muslims	Muslims
11. Hindus	Hindus
12. Buddhists	Buddhists
13. Sikhs	Sikhs
14. Others	Others

For "Others" see "Others" in the list of churches.  
For "Others" see "Others" in the list of churches.  
For "Others" see "Others" in the list of churches.  
For "Others" see "Others" in the list of churches.  
For "Others" see "Others" in the list of churches.





# LAND BIRDS.

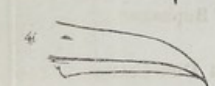
1 Falcistrotes  
Falco



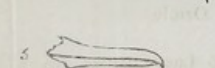
2 Vultur



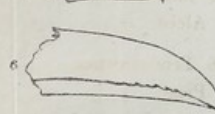
3 Strix



4 Cultriostrotes  
Corvus



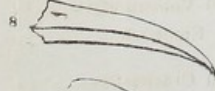
5 Cultellirostres  
Turdus



6 Serratiostrotes  
Rhamphastos



7 Galeatiostrotes  
Buceros



8 Lituistrotes  
Upupa



9 Forcipiostrotes  
Psittacus



10 Tholiostrotes  
Gallina



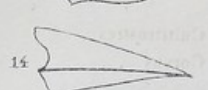
11 Tunmidirostres  
Columba



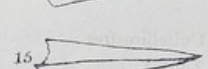
12 Asciiostrotes  
Ani



13 Obtusiostrotes  
Buphaga



14 Cuneirostres  
Oriolus



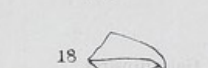
15 Lanceirostres  
Alcedo



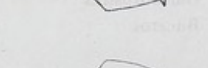
16 Terebrirostris  
Picæ



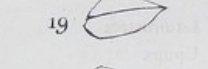
17 Conirostres  
Fringilla



18 Unciconirostres  
Loxia



19 Vomerirostres  
Emberiza



20 Crucirostres  
Coccothraustes



21 Patulirostres  
Bucco

## LATHAM'S ORDERS.

Accipitrine 1. 2. 3.

Pies 4. 6. 7. 8. 9. 12. 13. 14.  
15. 16—22. 23.

Passerine 5. 17. 18. 19. 20. 21.  
24. 25. 26. 27.

Columbine 11.

Gallinaceous 10.

Struthious 28. 29.

Waders 30. 31. 32. 37. 39. 40.

Webfooted 33. 34. 35. 36. 38.



# LAKE BIRDS

1. *Colinus virginianus*

2. *Spizella monticola*

3. *Junco hyemalis*

4. *Passer domesticus*

5. *Spizella monticola*

6. *Junco hyemalis*

7. *Passer domesticus*

8. *Spizella monticola*

9. *Junco hyemalis*

10. *Passer domesticus*

11. *Spizella monticola*

12. *Junco hyemalis*

13. *Passer domesticus*

14. *Spizella monticola*

15. *Junco hyemalis*

16. *Passer domesticus*

17. *Spizella monticola*

18. *Junco hyemalis*

19. *Passer domesticus*

20. *Spizella monticola*

21. *Junco hyemalis*

22. *Passer domesticus*

23. *Spizella monticola*

24. *Junco hyemalis*

25. *Passer domesticus*

26. *Spizella monticola*

27. *Junco hyemalis*

28. *Passer domesticus*

29. *Spizella monticola*

30. *Junco hyemalis*

31. *Passer domesticus*

32. *Spizella monticola*

33. *Junco hyemalis*

34. *Passer domesticus*

35. *Spizella monticola*

36. *Junco hyemalis*

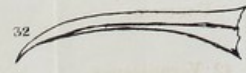
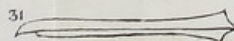
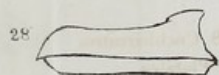
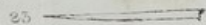
37. *Passer domesticus*

38. *Spizella monticola*

39. *Junco hyemalis*

40. *Passer domesticus*





22 Subulirostres  
Certhia

23 Aculeirostres  
Trochilus

24 Fissirostres  
Hirundo

25 Spicirostres  
Tanagra

26 Spinirostris  
Motacilla

27 Gemmirostris  
Parus

28 Rhombirostres  
Struthio

29 Bifalcirostris  
Dodo

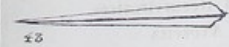
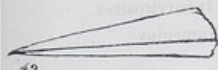
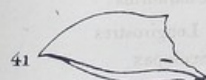
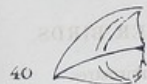
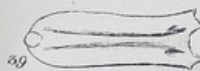
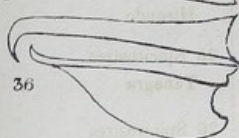
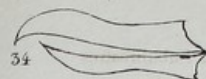
#### WATER BIRDS.

30 Tubirostres  
Charadrius

31 Longirostres  
Scolopax

32 Incurvirostres  
Numenius

33 Recurvirostres  
Avosetta



34 Forficirostres  
Rynchops

35 Hamirostres  
Diomedea

36 Saccirostres  
Pelecanus

37 Biformirostres  
Phaenicopteros

38 Cochleirostres  
Platalea

39 Linguirostris  
Anas

40 Bipenniostres  
Alca

41 Catinirostris  
Cancroma

42 Verutirostres  
Ardea

43 Cuspidoirostres

It is not assumed that this table exhibits an arrangement approaching to perfection. It merely attempts to display external similitudes and diversities, which appear to be the most prominent indications of instincts, habits, or destinations.



33. *Phaethon rubricauda*

*Phaethon*

34. *Phaethon rubricauda*

*Phaethon*

35. *Phaethon rubricauda*

*Phaethon*

36. *Phaethon rubricauda*

*Phaethon*

37. *Phaethon rubricauda*

*Phaethon*

38. *Phaethon rubricauda*

*Phaethon*

39. *Phaethon rubricauda*

*Phaethon*

40. *Phaethon rubricauda*

*Phaethon*

41. *Phaethon rubricauda*

*Phaethon*

42. *Phaethon rubricauda*

*Phaethon*

43. *Phaethon rubricauda*

*Phaethon*

44. *Phaethon rubricauda*

*Phaethon*

45. *Phaethon rubricauda*

*Phaethon*

46. *Phaethon rubricauda*

*Phaethon*

47. *Phaethon rubricauda*

*Phaethon*

48. *Phaethon rubricauda*

*Phaethon*

49. *Phaethon rubricauda*

*Phaethon*

50. *Phaethon rubricauda*

*Phaethon*



# ORDERS OF BIRDS

ACCORDING TO

	LINNÆUS. <i>a.</i>	CUVIER. <i>b.</i>	ILLIGER. <i>c.</i>	TEMMINCK. <i>d.</i>	LATHAM. <i>e.</i>	VIGORS. <i>f.</i>	BLUMENBACH. <i>g.</i>
1	Accipitres.	Accipitres.	Raptatores. <i>a. 1. b. 1.</i>	Rapaces. <i>a. b. c. 1.</i>	Land birds. Accipitrine. <i>a. b. c. d. 1.</i>	Raptores. <i>In all, 1.</i>	Land. Accipitres. <i>In all, 1.</i>
2	Picæ.	Passeres. <i>a. 3.</i>	Scansores. <i>a. 2. b. 3.</i>	Omnivoræ. <i>a. 2. 3. b. 2. c. 2. 3.</i>	<i>a. 2. b. 2. 3. c. 2. 3. d. 2. 3. 7.</i> Pies. Three divisions: 1. feet for walking; 2. for climbing; 3. for leaping.	Insessores. <i>e. 2. and 3.</i>	Levirostræ. <i>e. 3. d. 5.</i>
3	Passeres.	Scansores. <i>a. 2.</i>	Ambulatores. <i>a. 3. b. 2.</i>	Insectivoræ. <i>a. 3. b. 2. c. 3.</i>	Passerine. <i>a. 3. b. 2. c. 3. d. 3. 4. 5. 6.</i>	Rasores. <i>e. 4. 5. 6.</i>	Pici. <i>e. 2.</i>
4	Gallinæ.	Gallinacæ.	Rasores. <i>a. 4. b. 4.</i>	Granivoræ. <i>a. 3. b. 2. c. 3.</i>	Columbine. <i>a. 3. b. 4. c. 3.</i>	Grallatores. <i>e. 7.</i>	Coraces. <i>e. 2.</i>
5	Grallæ.	Grallæ.	Cursores. <i>a. 5. b. 5.</i>	Zygodactylæ. <i>a. 2. b. 3. c. 2.</i>	Gallinaceous. 1st division, 4 toes; 2d, 3 toes.	Natatores. <i>e. 8, 9.</i>	Passeres. <i>e. 3.</i>
6	Anseres.	Palmipedes. <i>a. 6.</i>	Grallatores. <i>a. 5. b. 5.</i>	Anisodactylæ. <i>a. 3. b. 2. c. 3.</i>	<i>a. b. c. 5. d. 12. and 16.</i> Struthious. 1st, 4 toes; 2d, 3 toes; 3d, 2 toes.		Gallinæ. <i>e. 4. 5.</i>
7			Natatores. <i>a. 6. b. 6.</i>	Aleyones. <i>a. 2. b. 3. c. 4.</i>	Water birds. Waders. 1. four toes; 2. three toes.		Struthionæ. <i>e. 6.</i>
8				Chelidones. <i>a. 3. b. 2. c. 3.</i>	Pinnated. <i>a. b. 6. c. 7. d. 14.</i>		Water. Grallæ. <i>e. 7.</i>
9				Columbæ. <i>a. 3. b. 4. c. 3.</i>	<i>a. b. 6. c. 7. d. 15.</i> Webfooted. 1. long legs; 2. short legs.		Anseres. <i>e. 8. 9.</i>
10				Gallinæ. <i>a. 4. b. 4. c. 4.</i>			
11				Alectorides. <i>a. 4. b. 4. c. 4.</i>			
12				Cursores. <i>a. 5. b. 5. c. 5.</i>			
13				Grallatores. <i>a. 5. b. 5. c. 6.</i>			
14				Pinnatipedes. <i>a. 6. b. 6. c. 7.</i>			
15				Palmipedes. <i>a. 6. b. 6. c. 7.</i>			
16				Inertes. <i>a. 4. b. 4. c. 4.</i>			

Linnæus makes three divisions of Picæ; 1. *Pedibus ambulatoriis*. 2. *Scansoriis*. 3. *Gressoriis*. Four divisions of Passeres; 1. *Crassirostræ*. 2. *Curvirostræ*. 3. *Emarginatirostræ*. 4. *Simplicirostræ*. Two divisions of Grallæ; 1. *Pedibus tetradactylis*. 2. *Tridactylis*. Two divisions of Anseres. 1. *Rostro denticulato*. 2. *Rostro edentulo*.

Vigor divides each order into five families or tribes; 1. *Gypogeranus*, *Vulturidæ*, *Falconidæ*, *Strigidæ*. 2. Five tribes; *Fissirostræ*, *Dentirostræ*, *Conirostræ*, *Scansores*, *Tenuirostræ*. 3. Five families; *Columbidæ*, *Phasianidæ*, *Tetraonidæ*, *Struthionidæ*, *Cracidæ*. 4. Five families; *Gruidæ*, *Ardeidæ*, *Scolopaciæ*, *Rallidæ*, *Charadriadæ*. 5. Five families; *Anatidæ*, *Colymbidæ*, *Alcadæ*, *Pelacandæ*, *Laridæ*.

Blumenbach defines *Levirostræ*, with very large, thick or deep, mostly hollow, and therefore light bills. Of *Gallinæ*, he observes, I have placed the doves in this order, as they are far more closely connected with the *Gallinæ* than with the *Passeres*, among which Linnæus had placed them.



LINKS	GOVERN	LINKS
1	1	1
2	2	2
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16	16	16

I have made these links in the order in which they are  
 numbered. The first link is the most important, and the  
 last link is the least important. The links are numbered  
 from 1 to 16, and the first link is the most important.  
 The links are numbered from 1 to 16, and the first link is the most important.  
 The links are numbered from 1 to 16, and the first link is the most important.



# LAMARCK'S DIVISIONS OF THE LINNEAN GENERA.

Linnean Genera.	Lamarckian Genera.	Linnean Genera.	Lamarckian Genera.	Linnean Genera.	Lamarckian Genera.	Linnean Genera.	Lamarckian Genera.
1. Chiton .	{ Chiton Chitonellus	12. Chama .	{ Chama Cardita Cypricardia Isocardia Tridacna Hippopus	23. Voluta .	{ Voluta Auricula Ancilla Tornatella Turbinella Cancellaria Columbella Mitra Marginella Volvaria Oliva	29. Helix .	{ Helix Paludina Caracolla Anostoma Bulimus Succinea Cyclostoma Planorbis Lymnaea Melania Valvata Ampullaria Janthina Sigaretus
2. Lepas .	{ Tubicinella Coronula Balanus Acasta Creusia Anatifera Pollicipes Cinaras Otion	13. Arca .	{ Arca Cucullaea Pectunculus Nucula	24. Buccinum	{ Buccinum Concholepas Phasianella Cassidaria Cassis Purpura Monoceros Harpa Dolium Eburna Terebra	30. Nerita .	{ Nerita Navicella Neritina Natica
3. Pholas .	{ Pholas Gastrochaena	14. Ostrea .	{ Ostrea Crenatula Perna Malleus Pedom Lima Gryphaea Pecten	25. Strombus	{ Strombus Pirena Cerithium Rostellaria Pteroceras	31. Haliotis	{ Haliotis Stomatia
4. Mya .	{ Mya Panopaea Glycymeris Anatina Corbula Hyria Vulsella	15. Anomia .	{ Anomia Placuna Crania Orbicula Terebratula Hyalea	26. Murex .	{ Murex Fasciolaria Fusus Pyrula Struthiolaria Ranella Triton Ricinula	32. Patella .	{ Patella Lingula Umbrella Parmophora Emarginula Fissurella Pileopsis Calyptraea Crepidula Ancylus Stomatella
5. Solen .	{ Solen Sanguinolaria Hiatella	16. Mytilus .	{ Mytilus Saxicava Anodon Modiola Avicula Meleagrina	27. Trochus .	{ Trochus Pyramidella Solarium Rotella	33. Dentalium	{ Dentalium
6. Tellina .	{ Tellina Amphidesma Pandora Psammobia Cyclas Cyrena	17. Pinna .	{ Pinna	28. Turbo .	{ Turbo Pupa Clausilia Scalaria Delphinula Turritella	34. Serpula .	{ Serpula Siliquaria Spirorbis Vermilia Aspergillum Septaria Vermetus
7. Cardium .	Cardium.	18. Argonauta	{ Argonauta Carinaria			35. Terebo .	{ Terebo Fistulana.
8. Mactra .	{ Mactra Lutraria Crassatella	19. Nautilus	{ Nautilus Orthoceras Nodosaria Spirula Cristellaria				
9. Donax .	{ Donax Capsa Petricola	20. Conus .	Conus				
	{ Venus Venerirupis Corbis Lucina Crassina Galatea Cyprina Cytherea	21. Cypraea .	Cypraea				
10. Venus .		22. Bulla	{ Bulla Bullaea Bulimus Achatina Physa Ovula Terebellum				
11. Spondylus	{ Spondylus Plicatula						



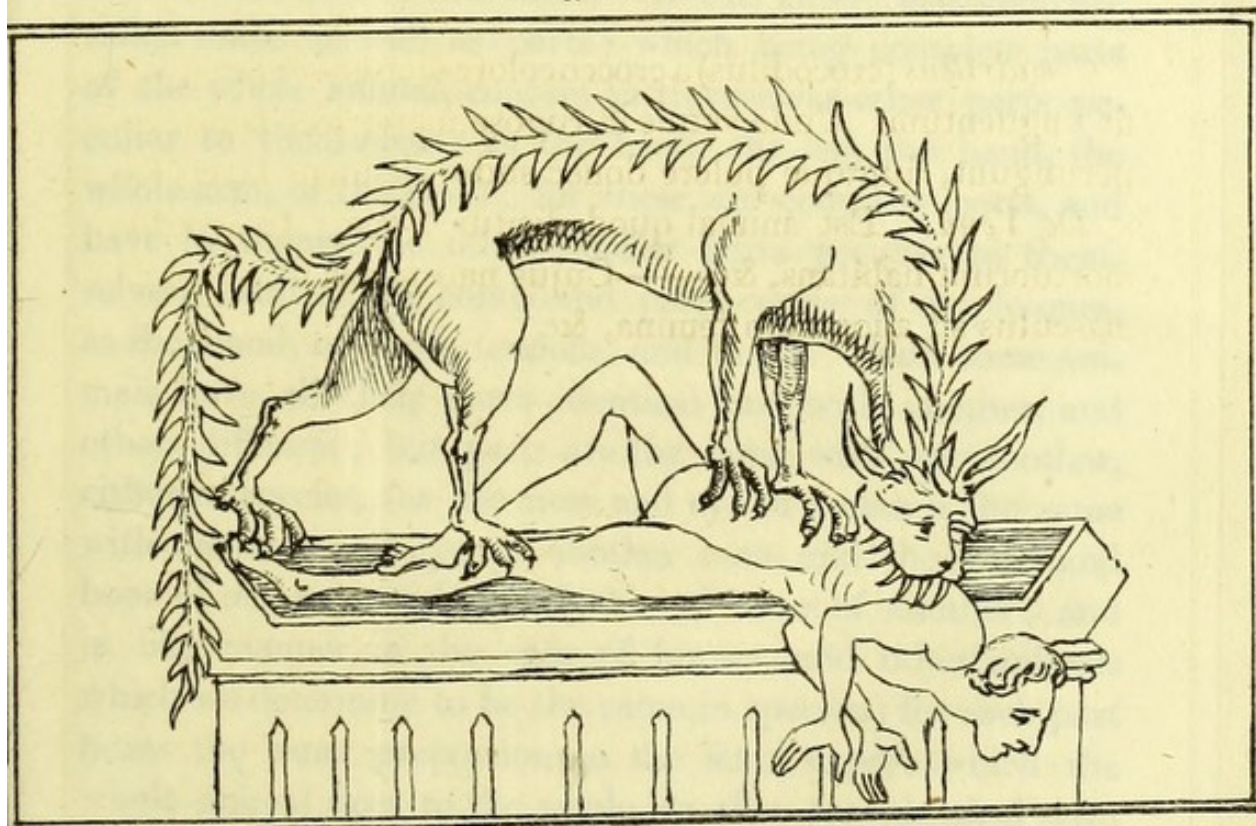
1. China	China	China
2. Japan	Japan	Japan
3. Korea	Korea	Korea
4. Formosa	Formosa	Formosa
5. Amoy	Amoy	Amoy
6. Canton	Canton	Canton
7. Shanghai	Shanghai	Shanghai
8. Hongkong	Hongkong	Hongkong
9. Peking	Peking	Peking
10. Tientsin	Tientsin	Tientsin
11. Hankow	Hankow	Hankow
12. Soochow	Soochow	Soochow
13. Ningbo	Ningbo	Ningbo
14. Hangchow	Hangchow	Hangchow
15. Ningpo	Ningpo	Ningpo
16. Shaochow	Shaochow	Shaochow
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100. Ningbo	Ningbo	Ningbo



Crocodile



Hyæna



*A specimen of Natural History in the  
12th. Century from a M. S. in  
the Ashmolean Museum*

*N. Whitlock Lith.*



APPENDIX

RECEIPTS

FOR THE HISTORY OF THE

RECEIPTS

of the Receipts of the Treasury of the United States, from the year 1789 to the year 1800, inclusive.

The Receipts of the Treasury of the United States, from the year 1789 to the year 1800, inclusive, are as follows:

1. The Receipts of the Treasury of the United States, from the year 1789 to the year 1800, inclusive, are as follows:

2. The Receipts of the Treasury of the United States, from the year 1789 to the year 1800, inclusive, are as follows:

3. The Receipts of the Treasury of the United States, from the year 1789 to the year 1800, inclusive, are as follows:

4. The Receipts of the Treasury of the United States, from the year 1789 to the year 1800, inclusive, are as follows:

5. The Receipts of the Treasury of the United States, from the year 1789 to the year 1800, inclusive, are as follows:

6. The Receipts of the Treasury of the United States, from the year 1789 to the year 1800, inclusive, are as follows:



# APPENDIX.

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## SPECIMEN

OF

## ARISTOTLE'S HISTORY OF ANIMALS.

### BOOK I. CHAP. I.

#### *Of the component parts of animals.*

SOME are simple, which are resolvable by division into parts similar to themselves; as for instance, flesh into flesh: others are compound, which are resolved into parts dissimilar to themselves; as the hand is not divided into hands, nor the face into faces. Of this latter class some are called limbs as well as parts; which being complete parts of the whole animal, contain in themselves other parts peculiar to themselves; as the head, the leg, the hand, the whole arm, or the chest; for these are complete parts, and have in themselves other smaller parts peculiar to themselves. But all the compound parts consist of simple ones, as the hand, of flesh, tendons, and bones. Now some animals have all their parts identical one with another, and others different; but parts are the same with one another, either in species, (as the nose and eye of a man is the same with the nose and eye of another man, and the flesh and bone of one man with the flesh and bone of another; and in like manner in the case of horses, and other animals which we determine to be the same in species,) for each part bears the same proportion to the similar part which the whole animal does to the whole, or they are identical with one another, but differ in excess or defect, in cases where the animals agree only in generic character. By *genus* I



mean, for instance, all that is included under one general term, as bird or fish; for each of these differs from the other generically, and in addition to the generic difference there are also many kinds of birds and fishes. And the greater number of parts in animals of the same genus differ by an opposition of accidents, such as colour and figure, that is, by their being more or less affected by these incidental circumstances. They differ besides in being many or few, great and small, and generally in every kind of excess and defect. Some, for instance, have a soft semi-crustaceous skin, others a covering of hard shell; some have a long beak, as cranes, and others a short one; some have large wings, and others small ones. But yet even among these some have parts which do not exist in others; as some have spurs, and others a crest, which others have not. But we may assert, that the greater number of parts, and those of which the whole body of the animal consists, are either the same, or differ by the opposition of excess and defect; for we may consider comparative quantity to be excess and defect.

But some animals neither have their parts specifically the same, nor generically, with the difference of quantity, but merely in the relation of analogy; as the bone is by analogy the same with the spine of the acanthus, the nail with the hoof, the hand with the claw, and the scale with the feather; for the feather in the bird is in the fish a scale. In this manner then we determine the parts of the several animals to be the same or different; regarding at the same time the situation of the parts. For many animals have the same parts, but differently situated, as the dugs, which in some animals are in the breast, in others are in the inside of the thigh. Of the uncompounded or simple parts, some are soft and moist, others dry and hard; and they are soft either absolutely or so long as they are in their natural situation, as blood, serum, fat, marrow, sperm, bile, milk in those which have it, flesh, and all parts analogous to these: of a different kind are the excrements, as phlegm, and that which passes from the bowels and bladder. Among the dry and hard parts are the following: the tendons, skin, venous



membrane, hair, bones, cartilage, nails, horn, (for the same word *horn* is a generic term, and used whether we speak in regard to form or substance,) and all things analogous to these. Now the differences of animals are determined by their manner of living, their actions, their habits, and their component parts: of which we have given a slight sketch at first, intending afterwards, when we have determined each kind, to discuss them more fully. The distinctions determined by their lives, actions, and habits, are such as the following, that some are aquatic, and some land animals. Aquatic animals are of two kinds. Some pass their lives and procure their food in the water, and admit internally the fluid, and again reject it; these cannot live when deprived of water, which is the case with most fish. Others live indeed and procure their food in the water, but do not admit internally the fluid, but air, and moreover produce their young out of the water. Of this kind are many animals which walk; as the otter, the latax, and the crocodile; and winged animals, as cormorants and divers; and reptiles, as the water-serpent. Some again procure their food in the water, and cannot live out of it, but yet neither admit the air internally nor the water; of which kind are the medusa, or sea-nettle, and oysters. But of aquatic animals some are peculiar to the sea, some to lakes, some to rivers, and some others to marshes, of which latter kind are the frog and newt; and again, of those which are peculiar to the sea, some live in the deep water, some near the shore, and others adhere to the rocks. Of land animals some admit the air internally, and reject it again, which is termed suspiration and respiration, as man does, and all land animals which have lungs; others do not admit the air internally, but live and procure their food on the earth, as the wasp and bee, and other insects; but I call all those *insects* which have an incision on the body, either on the upper part of the body, or on the upper and lower parts together.

But although many land animals, as we have before said, procure their food from the water, no aquatic animal which admits internally the water procures its food from the land.



But some animals at first live in the water, but afterwards change their form and live out of it, as in the case of the grubs in rivers, for from these are produced the gadflies. Again, some animals remain always in the same place, others change their situation, of which the former are aquatic, for there is no land animal which remains without change of place: but many aquatic animals live entirely in a state of adhesion, as do many kinds of shell fish. The sponge also appears to possess a kind of animal sense; a proof of which is, that it is torn away from the spot to which it adheres with more difficulty when the attempt is not made with a degree of concealment, as some assert. Some animals at one time adhere, and at another are unattached, as is a particular kind of that which is called the sea-nettle; for some of these are unattached, and feed by night. Many again are unattached, but without the power of motion, as oysters, and the fish called olothuria, (tubular fish.) Some move by swimming, as common fish, soft aquatic animals, (mollusca,) and those which have a soft shell, like that of the carabus; others walk, as do all kinds of crabs; for these, although in their nature aquatic animals, move by walking. Of land animals some are winged, as birds and bees, (which in other respects differ from one another;) others move on the surface of the earth, which latter are subdivided into those which walk, those which creep, and those which draw themselves along on the earth, (ἰλυσπαστικά,) but there is no animal which only moves by wings, in the same manner as a fish is only capable of swimming; for even those whose wings consist of membrane, walk; and the bat has feet, as has also the seal, although very short ones. And there is a kind of bird which has weak feet, which has from this circumstance been called the *apous*, (swift,) as if it had no feet: but this little bird is very strong on the wing, and almost all birds like it are strong on the wing, but have weak feet, as the swallow, for instance, and the *falcula*, (sand martin;) for these birds are of similar habits, and have the same kind of wings, and in appearance are very like each other: of these the *apous* is seen at all seasons, but



the falcula only in rainy weather in the summer, at which time it is seen and taken; but generally speaking this bird is scarce. Animals which both walk and swim are very numerous. There are also other distinctions, made with respect to the manners of life and the actions of animals, of the following nature. Among all kinds, those which walk, those which fly, and those which swim, some are gregarious, some solitary, and some partake of both habits. And again, of the gregarious some are political, and some live dispersed. Among gregarious animals are the pigeon, the crane, and the swan, among birds, (but no bird with curved talons is gregarious;) and among swimming animals many kinds of common fish, (or scaled fish, ἰχθύς,) as for instance, those which they call dromades, thynni, pelamides, and amiæ; but man partakes of both habits. Political animals are those which execute any one work in common among them all, which all gregarious animals do not do. Of this kind are man, the bee, the wasp, the ant, and the crane: of which again some are subject to a ruler, others are without any presiding authority; of the former kind are the crane and bee; the ant, and innumerable others, are subject to no authority. Again, both among gregarious and solitary animals, some are inclined to remain in the same place, others to wander. And again, some are carnivorous, some herbivorous, some omnivorous, and some use food peculiar to themselves, as for instance bees and spiders, of which the former live on honey and a few other sweet things, and the latter procure a subsistence by catching flies; others live entirely on fish. Some again hunt for their prey, and some form stores of provision, some do not. Some again have dwellings of their own, some have none: of the former kind are the aspalax, (mole,) the mouse, ant, and bee; of the latter kind are many insects and quadrupeds. And with regard to the places where they dwell, some live in holes in the earth, like the lizard and snake, others live on the surface of the earth, like the horse and dog. Again, some make holes for themselves in the earth, and others do not; some prefer to live in the dark, as the owl and bat; others



in the light. Some again are tame, and others wild; and of these some are always the same; as man and the mule are always tame, but the panther (*pardalis*) and wolf always wild. Some also can be quickly rendered tame, as the elephant; which last division we may consider in another manner, for all animals which are generally tame are also sometimes wild, as is the case with the horse, the ox, swine, sheep, goats, and dogs. Again, some animals produce a sound, partly without voice, and others by means of a voice; and of the latter kind some have a language, and some have no articulate sounds; some are garrulous, and others inclined to silence; some sing, others have no song: but this is a property common to them all that have song, that they sing and use their voice most about the time of breeding. Some live in the fields, as the wild pigeon, (*phatta*,) some in the mountains, as the hoopoe, (*epops*,) some in the neighbourhood of man, as the tame dove, (*peristera*.) Some have a strong propensity to sexual intercourse, like the partridge and common fowl; others are more inclined to abstain from it, which is the case with all birds of the crow kind, for they are very rarely connected. Again, some are pugnacious, and others cautious. Among the former I include all which attack or resist when injured; among the latter, those which have in themselves an instinctive tendency to avoid that which might hurt them. But animals differ also in disposition, with such distinctions as the following. Some are mild, with little spirit and no obstinacy, like the ox; others are violent, obstinate, and indocile, like the wild boar. Some are cautious and cowardly, as deer and hares (*dasytus*); some of an ungenerous and insidious disposition, as the serpent; some of a generous, brave, and noble disposition, as the lion; and some bold, fierce, and at the same time insidious, as the wolf. (By the term *noble*, I mean the courage of a good kind; by *bold*, the same quality, so far as it is consistent with a baser nature.) Some are cunning and mischievous, as the fox; some of high courage, affectionate, and bland, as the dog; some mild and easily tamed, as the elephant; some shy and cautious,



as the goose; and some envious and vain, as the peacock. But man is the only animal which deliberates; many animals partake with him the faculty of memory and of learning, but no animal except man has the power of voluntarily recalling any thing to mind. I shall hereafter discuss each particular kind more accurately, both with respect to its disposition and habits of life.

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#### ERRATA.

Page 13, line 3, *for* with gills and cold white blood, *read* with gills and cold red blood.—Dele figures preceding paragraphs in pages 10, 11, and 14.



