

ment of the greater Star is taken) by a Micrometer (consisting of divers fine Threads parallel and transverse) may (at the same time) be observed the Distance of the two Stars, each from other, in that Position (both being at once within the reach of the Micrometer;) which distance (the Instrument remaining unmoved) if it be found (at different times of the Year) not to be the same; this will prove, that there is a *different* Parallax of these two Stars.

This latter part of the Observation (of their different distances at different times) I suggest, as more easily practicable though not so nice as the former. For it may be done, I think, without any further *Apparatus* there than a good Telescope, of ordinary form, furnished with a Micrometer, (this being carefully kept unvaried during the Interval of these Observations.) And if this part only of the Observation (without the other) be pursued; it matters not though the two Observations (near the two Solstices) be, one at the Eastern, the other at the Western Azimuth (whereby both may be taken in the Night-time,) for the distance must (at both Azimuths) be the same, if after observing the Azimuth of the greater Star it be necessary to move the Micrometer for measuring its distance from Alcor that may be done another Night (and it is not necessary to be done at one Observation) for that distance cannot be discernably varied in a Night or two.

I shall give you no farther trouble at present, but subscribe my self, Sir,  
*Yours, &c.*

## IX. An Account of a BOOK.

*Synopsis Methodica Animalium Quadrupedum & Serpentim Generis Auth. Joanne Raio, S.R.S.*

THE Excellent Author of this *Synopsis* of Quadrupeds and Serpents, continues to oblige the World with fresh and frequent Specimens, not only of his great Penetration in discovering, but of his particular Sagacity in ranging and digesting the vast Body of *Nature* in most proper Classes and Orders; whereby the Memory is extremely assisted, and the Beauty of the

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the Creation illustrated. Of this the Worthy Author has already been pleas'd to publish very conspicuous Proofs in the Histories of Plants, Birds, Fishes, and perhaps may do more in Insects.

The Design of this present Work, intended for a Manual or Pocket-Book, is to reduce all Quadrupeds into the most proper and natural Method, for the more easie Comprehension and Memory of them; and to add to the several *Species* such short Characterick Notes, as whereby they may be certainly known and distinguished from others of the same kind.

First of all, there is propos'd the most exact division of all Animals in general, which is first into *Sanguineous* and *Exanguinous*. Under the *Exanguinous*, or such as want that red Liquor we call Blood, are comprehended, 1. All *crustaceous* Fishes, *Crabs*, *Lobsters*, *Shrimps*, 2. All *Testaceous* or Shell-Fishes, as *Cockles*, *Muscles*, *Oysters*, *Scallops*, *Periwinkles*, *Whilks*, &c. as also all Land Shell-Snails, 3. Those they call *Mollia*, or Soft-fishes, as *Pulps*, *Cuttle-fishes*, *naked Snails*, &c. 4. Insects of all sorts.

The Sanguineous kind are divided into such as breath by *Lungs*, and such as breath by *Gills*, of which kind are all Sanguineous Fishes except the *Whale-kind*. Such as breath by *Lungs* are divided into those that have but *one Ventricle* in the Heart, and such as have *two Ventricles*. Of the former kind are those they call *Oviparous Quadrupeds* and *Serpents*.

The latter are again subdivided into *Viviparous*, or such as bring forth living Young, and *Oviparous*, or such as lay Eggs, which are Birds or feathered Foul.

Lastly, The Viviparous are divided into *Aquatic*, or the *Whale-kind* and *Terrestrial* (under which the Author comprehends the Amphibious) or *Quadrupeds*; although all viviparous Animals of this kind are not Four-footed, there being one exception, *viz.* The *Manati* or *Sea cow*, which hath but two Feet. But all of them without exception are hairy, and so may be distinguished from the *Whale-kind*; all of which have a smooth Skin.

Then follows a Division and Table of *Viviparous Quadrupeds* or *Viviparous hairy Animals*: which are either *hoof'd* or *claw'd*.

The *hoof'd* are either *whole-footed*, or *whole-hoof'd*, as the *Horse* and *Ass*; or *cloven-footed*. The *Cloven-hoof'd* are either *Bisulc*, such as have the Hoof divided into *two* parts, as the *Ox*, *Sheep* and *Goat*, or *Quadrifulc*, which have the Hoof divided into *four*. The former are either *Ruminant*, such as chew

the

the Cud ; or *Non-Ruminant*, viz. The *Hog-kind*. The *Ruminant* are divided in respect of their Horns, of which there are three Kinds. 1. The *Beef-kind*, which have four Teats. 2. The *Sheep-kind* which bear Wool, have but two Teats, and wreathed Horns. 3. The *Goat-kind* which have streighter Horns, and are covered with Hair instead of Wool ; and such as have *solid*, *branched* and *deciduous* Horns, as the *Deer-kind*. The *Claw'd*, have the Foot divided either into *two* Claws, viz. the *Camel-kind*, or into *more*, called therefore *Multifidous*.

The *Multifidous* are divided into such as have broad Nails, and a humane Shape, as *Apes* and *Monkeys*, and such as have narrower and pointed Nails.

These latter in respect of their *Teeth* are divided into such as have *many fore Teeth* or *Cutters* in each Jaw ; and such as have but *two*, all which last are *Herbivorous* or *Phytivorous* Animals, and from the most known Creature of this Tribe called the *Hare-kind*.

Those that have *more fore Teeth* or *Cutters* are distinguished into *greater*, which have either a *shorter Snout*, and round or square Head ; or a *longer Snout* and Head : These from their likeness to the most known Animals of each kind, the *Cat* and the *Dog*, we call the former the *Cat-kind*, and the latter the *Dog-kind* : To the *Cat-kind* belong the *Lion*, *Tyger*, *Leopard*, *Ounce*, &c. to the *Dog-kind* belong the *Wolf*, *Fox*, *Badger*, *Otter*, &c. and *lesser*, which from their long slender Bodies, like to the *Weasel*, we call the *Vermineous* or *Weezel-kind*.

To the *Cat-kind* are referred some anomalous Animals, viz. The *Bat*, and the *American* Creature called *Ai* or *Sloth*. To the *Dog-kind* from their having a longer Snout are referred ; The *Urchin* or *Hedge-hog*, the *Tatou* or *Armadillo*, the *Mole*, the *Sbrew-mouse* or *Ex'd*, i. e. *Earth-shrew*, the *Tamandua* or *Ant-bear* ; which hath no Teeth at all.

Then are briefly described the several Species of all these kinds in order : and to some of them large Anatomical Descriptions and Observations added. As first of the *Uterus* of a pregnant Sow, wherein the Adhætion of the *Chorion* to the *Uterus* round about is shown ; and notice taken, 1. Of the two large diaphanous Bladders, one at each end of the *Tunica Allantoides*, into which is a Passage out of the *Allantoides*, so that the Liquor contained therein may easily be impelled into the Bladders, and out of the Bladders back again into the *Allan-*

*toides*, 2. Of the great quantity of Water contained in the *Allantoides*, more by far than the Urine of so small an Animal in so short a time can likely amount to, and inquiry made into the Original and Use of it. Its likely part of it may be separated from the Blood, and excerned into the Cavity of the Tunicles by certain little Glandules, which the Author observed disseminated all over the *Chorion*. The *Tubæ uterinæ* or *Fallopianæ* in this Creature are described; and shewn to be when extended at least 9 Inches long. They do manifestly perforate the *Cornua uteri*, so that a Style or Probe may easily be thrust either upward out of the *Uterus* into the *Tubæ*, or downward out of the *Tubæ* into the *Cornua uteri*, without resistance or the impediment of any Valve.

Secondly, Dr. *Tyson's* Description of the *Tajacu* or *American Musk-hog*, recorded in the *Philosophical Transactions*, Numb. 153. is inserted at large, wherein are many curious Remarks, which I shall not mention, because I suppose they are well known, having been so lately published in these Papers.

Thirdly, An Anatomical Description of the *Elephant* by the Learned and Ingenious Dr. *Moulins*, which also having by the Author been published in *English*, I shall for the Reason forementioned, forbear to set down Particulars.

Fourthly, *Excerpta* out of the Description of the *Ape* set forth by *Parisian* Academists, wherein the Differences between the internal and external Parts of the *Ape* and *Man* are observed and noted.

It is especially remarked, that though the Muscles of the *Os hyoides*, or Tongue-bone, the Tongue, the *Larynx*, and *Pharynx*, which especially serve for the Articulation of the Voice, be in *Apes* altogether like to those of a *Man*, at least much more than the Muscles of the Hands, which the *Ape* uses almost as perfectly as *Man* himself to all purposes; yet is the *Ape* deprived of Speech. Whence it is clear, that Speech is an Action peculiar to *Mankind*, by which he is more distinguished from Brutes, than by the use of the Hand: neither doth it necessarily follow, that natural Agents do perform such and such Actions, because they are furnished with Organs proper for the Performance of them.

Lastly,

*Lastly*, Such *Sanguineous* Creatures as breath by Lungs, and have but one Ventricle in their Hearts are enumerated and described. They are of four kinds, 1. *Frogs*, 2. *Tortoises*, 3. *Lizards*, 4. *Serpents*: Concerning each of which there are curious Anatomical Observations added: But especially a large Description of the outward and inward parts of the *Rattle-snake*, composed by the fore-mentioned Learned Person Dr. *Tyson*, and published in these Transactions, *Numb.* 144. the Particulars whereof I shall therefore omit.

Before this *Synopsis* are premised some Discourses concerning Animals in general.

As *First*, Whether they are meer Machines, or have any Sence and Perception, that is, whether they reflect upon, and are conscious of what they do or suffer. The Affirmative whereof seems most probable to the Author.

*Secondly*, Concerning the Generation of Animals there are Three Questions discussed. 1. Whether there be any Spontaneous or Equivocal Generation? The Author's Opinion is, That there is no such thing, but that all Animals, even the vilest Insects, are generated by Animal Parents of their own kind. 2. Whether all Individuals of every Species of Animals, that ever were or shall be, were at first created by God, or whether there are every day new ones produced by Generation? The Author is inclinable to their Opinion that hold all were at first created, but not confident of it. Seeing neither Man nor any other Creature is capable of forming such an Engine as an Animal Body; and since all Females have in them from their first Formation the Seeds of all the Individuals they shall during their whole Life bring forth, it is clear they have no power of producing new ones; and a strong Presumption, that all that have been or shall be were at first created. 3. Whether the Seeds of Animals, or rather the primordial Animalcules are lodged in the Egg of the Female, or in the Sperm of the Male. The Author is of the former Opinion, for many Reasons which may be seen in the Book.

*Thirdly*

*Thirdly*, The Distinction of Animals into *Viviparous* and *Oviparous* is considered; and it is shewn, that if the Word *Viviparous* signifies according to the Etymology of it, such as bring forth live Young, then Animals of the same *Genus* may be some *Viviparous* and some *Oviparous*: So for Example, Some Serpents, as the *Adder*, are *Viviparous*, and some, as the common *Snake*, *Oviparous*: But if the Word *Viviparous* signifies such Animals as continually afford Nourishment to the *Fœtus* during gestation from the Womb it self: And *Oviparous* such as either lay Eggs, or produce perfect Eggs, that is such as contain all the Nourishment of the *Fœtus* till it be excluded, though they retain such Eggs in the Womb till exclusion, affording them only warmth and harbour; then the distinction may be of good use; and as well such Serpents and Lizards as hatch their Eggs in their own Bodies, as those that lay them in a Dunghil, or other warm place to be cherished and hatch'd by the Heat of the Sun, may be called *Oviparous*.

For the more easie and clear Comprehension and Distinction of the several Kinds of Animals, Mr. *Ray* gives two *Schemes* or *Tables* of them: The first a General one of all Animals; the second a Particular one of *Quadrupeds*.

Animals are either

- Sanguineous*, that is such as have Blood, which breath either by  
 { *Lungs*, \* having either  
 { *Two Ventricles in their Hearts*; \*\* and those either  
 { *Viviparous*,  
 { { *Aquatic*, as the Whale-kind  
 { { *Terrestrial*, as Quadrupeds; or in general all hairy  
 { { Animals.  
 { *Oviparous*, as Birds, which have immoveable and  
 { perforated Lungs.  
 { *But one Ventricle in their Hearts*, as Frogs, Tortoises,  
 { Serpents.  
 { *Gills*, as all Sanguineous Fishes except the Whale kind.  
*Exanguineous*, or without Blood, which may be divided into  
 { *The Greater*, either  
 { *Naked*  
 { { *Terrestrial*, as Naked Snails  
 { { *Aquatic*, as the Poulp or Pour-control, *Polypus*; the  
 { { Cuttle-fish, *Sepia*; The Sleave or Ink-fish *Lolligo*  
 { *Covered*, with a Tegument either  
 { { *Crustaceous*, as Lobsters and Crab-fish.  
 { { *Testaceous*, whether *Univalve* as Limpets, or *Bivalve*,  
 { { as Oysters, Muscles, Cockles; or *turbinat*e, as Peri-  
 { winkles, Snails, &c.  
 { *The lesser*, as Insects of all sorts.

\* Gills and Lungs differ in that Gills are but as it were inverted Lungs: The Air being drawn inwardly into the Lungs, whereas it only outwardly touches or slides by the Gills.

\*\* Animals that have two Ventricles in their Hearts use a frequent and constant inspiration and expiration, taking in and breathing out the Air. But those that have but one Ventricle use no such frequent inspiration and expiration; but receive in and retain the Air a considerable time in their Lungs before they breath it out again.

*A T A B L E of Viviparous hairy Animals or  
Quadrupeds.*

Viviparous Quadrupeds or Viviparous hairy Animals are either

*Hoof'd*, which are either

*Whole-footed* or hoof'd, as the Horse and As.

*Cloven-footed*, having the Hoof divided into

Two principal parts, called *Bifulca*, either

Such as chew not the Cud; as all sorts of Swine

*Ruminant*, or such as chew the Cud, divided into

Such as have perpetual and hollow Horns, of which there are three Kinds, viz. 1. The Beef-kind. 2. The Sheep-kind. 3. The Goat-kind.

Such as have solid, branched and deciduous Horns; as the Deer-kind.

Four parts, which we call *Quadrifulca*; as the Rhinocerot and Hippopotamus.

*Clawed*, or *Digitata*, having the Foot divided into

Two parts or Toes, having two Nails, as the Camel-kind.

Many Toes or Claws; either

*Undivided*, sticking all together, covered with a common Skin, the tips of the Toes only peeping out or appearing outwardly, and being covered with Nails, as the Elephant.

*Divided* from each other a good way down, which have either

Broad Nails and an *Humane Shape*, as Apes and Monkeys.

Narrower and more pointed Nails; in which in respect of their Teeth are divided into such as have

Many fore Teeth or Cutters in each Jaw, either

The greater, which have

A shorter Snout and rounder Head, which we call the *Car-kind*.

A longer Snout and Head, which we call the *Dog-kind*

The lesser, with a long slender Body, and shorter Legs, which we call the *Vermine* or *Weazel-kind*.

Only two large and remarkable fore Teeth, all which are *Phytivorous*. These we call the *Hare-kind*.

For all which, and the many subordinate Species under each Genus; together with short Histories of them, the Book it self must be consulted.

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