An Account of the Diſſection of a Porpeſs, *promiſed Numb.* 74; *made, and communicated in a Letter of Sept.* 12 1671, *by the Learned Mr.* John Ray, *having therein obſerv'd ſome things omitted by* Rondeletius.

SIR,

ABout the later end of *April* 1669, being at Weſtcheſter with my Lord Biſhop of that Dioceſs, in the company of *Fr. Willughby* Eſq; I had the good fortune to meet with a young *Porpeſs* of a convenient ſize for Diſſection, brought thither by ſome Fiſhermen, who caught him upon the Sands, where the Tide had left him; in the Anatomy whereof I obſerved ſome things omitted by *Rondeletius* in his Deſcription of the *Dolphin.*

The length of this was by meaſure 3 feet and 7 inches. A ſtring of 2 feet and 2 inches girded him in the thickeſt place. The ſhape of his body was not much unlike that of a *Tunny fiſh*; only his ſnout longer and ſharper. His skin was thin, ſmooth, and without ſcales. In an old and well grown fiſh its like the skin may be thick and tough, as *Rondeletius* repreſents it.

His Fins are cartilagineous, and flexible, not ſharp or prickly, as the Ancients report them. On his back he hath only one, which was diſtant from the tip of his ſnout 1 foot and 9 inches; and the baſis of it in length 5½ inches; ſo that meaſuring from the tip of his ſnout to the end of the tayl, it was ſcituate ſomewhat below the middle of the fiſhes length. On the Belly it had only one pair of fins, 9½ inches diſtant from the tip of the lower mandible, much about the place, where the foremoſt pair of fins in other fiſhes uſually grow. The Tayl is forked, of the figure of a Creſcent; the breadth thereof from angle to angle 11 inches. The *ſitus* or poſition of it contrary to that of all other fiſhes, except thoſe of this kind. For, whereas the plain of the tayl of other fiſhes, when they ſwim, ſtands erected perpendicularly to the plain of the Horizon, in this fiſh (and I ſuppoſe in all others of the *Cetaceous* kind) it lyes parallel thereto. The reaſon whereof I conceive to be *partly* to ſupply the uſe of the hindmoſt pair of

of fins in other fishes, which serve to ballance the body, and keep it up in the water, answering in proportion to the hinder legs of a Quadruped; hence we see, that those fishes, which have long bodies and but one pair of fins, as Eeles and the like, cannot keep themselves up in the water, but lye always grovelling on the bottom: *partly*, to facilitate the fishes ascent to the top of the water (to which he can immediately raise himself by a light jerk of his tayl thus placed) for the use of respiration, which is necessary for him, as for Quadrupeds. For, doubtless if violently deteined under water, he would in a short time be suffocated or drowned.

Immediately under the skin lay the fat, which, as I remember, our Seamen call the *Blubber*: It was firm, full of fibres, and in this small fish, of an inch thickness, encompassing and enclosing the whole body, back, belly and sides. The use whereof I conceive to be, 1. to keep the cold water at a distance from the bloud, which is, I believe, actually and to the touch hot, in a degree not much inferiour to that of Quadrupeds, and therefore by immediate contact of the water would be apt to be chilled. 2. To keep in the hot steams of the bloud from evaporating; by that means also preserving and maintaining its natural heat: as we see water, and any other liquour in a close vessel will retain its heat much longer than in an open; and nothing is more proper to detain the finest and subtilest evaporations and spirits, than oyl or fat. 3. Perhaps also, to lighten or counterpoise the body of the fish, which would otherwise be too heavy to move and swim in the water. Under the Blubber lay the Musculous flesh like to that of Quadrupeds, but of a darker colour.

The Body was divided into three Regions or *Ventres* like a Quadrupeds, *viz.* Head, Breast, and Belly; the vessels and *viscera* in each *venter*, for the main, the same as in Quadrupeds: 1. The Abdomen was compassed about with a strong *Peritonæum*. The Guts joyned to the Mesentery, and of a very great length, by measure 48 foot, without any difference or distinction of great and small; neither was there any Blind-gut, or Appendix, that I could find. The Stomach was of a strange make, being divided into two large bags, beside other

other ſmaller ones. I found nothing in it, but a good number of thoſe little long fiſhes, which our Fiſher-men dig out of the Sands at low water, and therefore call in ſome places Sand-Eeles; by ſome they are called *Launces*, and by Geſner, *Ammodytæ*.

The Liver was of a moderate ſize, ſcituate in the right ſide, and divided into two lobes, having no *cyſtis fellea* or receptable of Gall annexed. The *Pancreas* large, ſticking cloſe to the third bag of the Stomach, into which alſo its *ductus* enters, and emptys it ſelf. The Spleen ſmall and roundiſh. The Kidneys larg, ſticking cloſe to the back, and lying contiguous one to the other, made up of many little kernels, like to, but much leſſer than, thoſe of an Ox; of a flat figure, having no *pelvis* in the middle, but the Ureters going out at the lower end.

The Urin bladder oblong, and little for the bulk of the Animal, having on each ſide a round ligament, made of the umbilical arteries degenerating. The *Penis* long, ſlender, having a ſmall ſharp *Glans*; it appears not outwardly, but lies hid in its ſheath within the body, doubled up or rather reflected in the form of the letter S, as is that of a Bull. The Teſticles lye within the cavity of the *Abdomen* on each ſide, as they do in an Hedg-hog, and ſome other Quadrupeds, of an oblong figure; for their internal ſubſtance, Seminal veſſels both *præparantia & deferentia*, *Epididymides*, *Vas pyramidale*, *Corpus varicoſum*, & *glandulæ proſtatæ*, exactly like to thoſe of Quadrupeds. The Seminal veſſels perforate the *Urethra* with many little holes, whereof four are moſt conſpicuous ſomewhat above the neck of the bladder.

The Diaphragm was muſculous, as in Quadrup. The Heart large, included in a *Pericardium*, had its two Ventricles; its *valvulæ Sigmoides ſemilunares*, *tricuſpides & mitrales*; its coronary arteries and veins: in a word, the whole ſtructure and ſubſtance of the heart and lungs agreed exactly with that of Quadrupeds. The Windpipe was very ſhort, as it muſt needs be, the fiſh having no neck; the *Larynx* at top was of a ſingular figure, running out with a long neck, and a nob at the end like an old faſhioned Ewer.

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The pipe in the Head, through which this kind of fiſh draw their breath, and ſpout out water, lies before the brain, and ends outwardly in one common hole, but inwardly its divided by a bony *ſeptum*, as it were into two noſtrils; but below again it opens into the mouth in one hole. This lower orifice is furniſhed with a ſtrong *Sphincter*, whereby it may be ſhut and opened at pleaſure, and above this *Sphincter*, the ſides of the pipe are lined with a glandulous fleſh, which if you preſs, you ſhall ſee ſtart, out of many little holes or *papillæ* into the cavity of the pipe, a certain glutinous liquor. Above the noſtrils is a ſtrong valve or membrane like an *Epiglottis*, which ſerves to ſtop the pipe, that no water get in there againſt the fiſhes will. Within the *fiſtula* are ſix blind holes having no out-let; four tending toward the ſnout; two above the valve that ſtops the noſtrils; and two beneath it; two tending towards the brain, having a long but narrow cavity for the uſe of ſmelling, as I conjecture, though opening the brain I could find neither olfactory nerves nor *proceſſus mammillares*. The Eyes are ſmall conſidering the bigneſs of the fiſh, and ſcituate at a good diſtance from the baſis of the brain. The Snout is long, and furniſhed with very large muſcles, to root or turn up the ſand at the bottom of the Sea for to find fiſhes, as appears in that we found nothing in his ſtomach but Sand-Eeles, which, as was intimated before, lye buried in the Sand. The Brain and *Cerebellum* are, for the ſubſtance and *anfractus* of them, the ſame with thoſe of Quadrupeds, only differing in the figure, as being ſhorter: But what they want in length, they make up in breadth. They have alſo the like teguments called *dura* and *pia-mater*. Six or ſeven pair of nerves, beſides the Optick: the ſame ventricles; only in the *medulla oblongata* we obſerved not theſe protuberances called *nates* and *teſtes*. The Skull (*Cranium*) is not ſo ſtrong and thick, as in Quadrupeds, but articulated after the ſame manner to the firſt *Vertebra* of the back-bone. This largeneſs of the brain, and correſpondence of it to that of man, argue this Creature to be of more than ordinary wit, and capacity, and make to ſeem leſs fabulous and improbable thoſe Ancient ſtories, related by *Herodotus* concerning *Arion*: By *Pliny* the Elder * concerning

* L. 9. hiſt nat. c. 8.

concerning a Dolphin enamoured of a Boy, whom he was wont to carry croſs a bay of the Sea, from *Baiæ* to *Puteoli*, to School, *&c.* By *Pliny* the Younger, of another enamoured of a boy at *Hippo* in *Africa*, whom he was wont to carry upon his back in like manner. The ſtory is worth the noting: *Epiſt.* 33. *l.* 9.

But to proceed; this fiſh had in each Jaw 48 teeth, ſtanding in a row like to little blunt pegs. The Tongue was flat above, of an equal breadth to the very tip, which was toothed or pectinated about the edges, tyed firmly down to the bottom of the mouth all along the middle, as *Ariſtotle* truly ſaith: whence I cannot but wonder, that *Rondeletius* ſhould herein contradict *Ariſtotle*, and affirm (contrary to truth, as I believe) *quòd Dolphinis lingua eſt mobilis, quæ modò exeri modò condi poteſt:* Unleſs perchance in this particular the Dolphin differs from the Porpeſs. For the Porpeſs is, as I take it, the *Phocæna* of the Ancient, which is a leſſer ſort of Dolphin, and not the *Dolphinus*; at leaſt if the fiſh, we are deſcribing, were a Porpeſs; for the teeth of this fiſh were leſſer than, and of a different figure from, thoſe in the jaw of the Dolphin we got beyond Seas: yet is the difference not great between the *Dolphin* and *Phocæna*. As for that fiſh, which our Sea-men now adays call the Dolphin, and which, as it is deſcribed by Mr. *Terry* and *Ligon*, hath teeth on its tongue, ſmall ſcales, is finn'd like a rock, of a pleaſant ſmell and taſt; what it is I know not, but I am ſure it is *toto genere* different from the *Dolphin* of the Ancients.

We obſerved not in this fiſh any Noſtrils beſides thoſe in the *fiſtula*, nor any ear-holes or *meatus auditorii* at all; wherein alſo *Ariſtotle* agreeth with us; which yet *Rondeletius* found out near the eyes: it being manifeſt, ſaith he, that a Dolphin doth hear, and ſeeing no creature can hear without a paſſage for that purpoſe to convey ſounds to the brain: *Hac ratione impulſus, cùm Delphini cranium diligentiſſimè contemplatus eſſem, manifeſtiſſimum audiendi meatum, qui ad cerebrum uſque patet, inveni ſtatim poſt oculum, tam exiguum, ut ferè oculorum aciem fugiat.* And we obſerved in the Skull a bone anſwering to the *Os petr ſum*, which moſt certainly was for the uſe of hearing. It had 6 ſhort Ribs that had no Cartilages, and ſeven that had Cartilages (on each ſide I mean.) The Breaſt-bone was very ſmall. As for the

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name *Porpeſs*, I agree with *Geſner*, that it was ſo called, *quaſi Porcus Piſcis*, moſt nations calling this fiſh *Porcus Marinus*, or the Sea-ſwine. Indeed it reſembles a Swine in many particulars, as the fat, the ſtrength of the ſnout, &c.

A Letter of Francis Willoughby *Eſquire, of* Auguſt 24. 1671. *Containing ſome conſiderable Obſervations about that kind of Waſps, call'd* Veſpæ Ichneumones; *eſpecially their ſeveral ways of Breeding, and among them, that odd way of laying their Eggs in the Bodies of Caterpillars, &c.*

AS I remember, M. *Liſter's* opinion is, that the *Muſcæ Ichneumones* lay their Eggs in the bodies of Caterpillars; which I look upon as very ingenious and true, and muſt ſubſcribe to it, though I cannot yet abſolutely demonſtrate it, as I hoped I ſhould have done before this. Theſe *Ichneumones* have all four wings, *Antennæ* like Bees; their body hanging to their breaſt by a ſlender ligament, as in Waſps; moſt, if not all, have ſtings, and are made of a maggot, that ſpins her ſelf a *Theca* before ſhe turns into a *Nympha*. There is great variety of them; *Some* breed, as Bees do, laying an Egg, which produceth a maggot, which they feed till it comes to its full growth: *Others*, as we gueſs, thruſt in their Eggs into plants, the bodies of living caterpillars, maggots, &c. For, it is very ſurprizing to obſerve, that a great Caterpillar, inſtead of being changed into a Butter-fly (according to the uſual courſe of nature;) ſhould produce ſometimes one, ſometimes two or three, and ſometimes a whole ſwarm of *Ichneumones*. I have obſerved this Anomalous production in a great many ſorts of Caterpillars, both hairy, and ſmooth; in ſeveral ſorts of maggots, and, which is moſt ſtrange, in one Water inſect. When there come many of theſe Ichneumon maggots out of the body of the ſame Caterpillar, they weave all their *Theca's* together into one bunch, which is ſometimes round with web about it, juſt like a bag of ſpiders Eggs; but I dare venture to anſwer M. *Liſter's* 10*th Quære* pag. 2172. of the Phil. Tranſ. negatively, that none of them feed upon ſpiders Eggs, but it is the ſimilitude of thoſe *Theca's*, conglobated together, to