OBSERVATIONS

ON

Marine Vermes, Inſects, &c.

By MATTHEW MARTIN,

Member of the BATH philoſophical Society.

With NOTES and QUOTATIONS from different Authors.

FASCICULUS I.

Let Heaven and Earth praiſe the Lord:
The Sea, and all that moveth therein. v. Pſalm 69.

EXETER:

Printed for the AUTHOR by R. TREWMAN.

Meſſrs. B. WHITE and SON, Horace's Head, Fleet-ſtreet; JAMES ROBSON, New Bond-ſtreet; LEIGH and SOTHEBY, York-ſtreet, Covent-Garden, London; S. HAZARD, Cheap-ſtreet, Bath; and the ſaid R. TREWMAN, Exeter, Booksellers.

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TO

SIR JOSEPH BANKS, BARONET,

PRESIDENT OF THE ROYAL SOCIETY;

BY WHOSE ACTIVE EXERTIONS,

AND UNDER WHOSE PATRONAGE,

THE SCIENCE OF NATURAL HISTORY

HAS BEEN SO LARGELY AUGMENTED,

SO LIBERALLY SUPPORTED;

THESE OBSERVATIONS,

ARE, WITH RESPECT, INSCRIBED,

BY HIS OBLIGED, AND

GRATEFUL SERVANT,

MATTHEW MARTIN.

Teingmouth,
Devon, 1786.

PREFACE.

I HAVE for ſome years purſued a practice of entering notes on various ſubjects of natural Hiſtory, which have fallen within the verge of my obſervation; and have made drawings of ſeveral, to which for various reaſons I have been induced to give this preference.

It has been my uſual method to connect my Notes and Drawings by correſpondent Numbers, but with the great variety of matters which I have had in hand, and my attention divided between collecting materials for the ſyſtematic arrangement of ſome, the acquiſition, feeding, enquiry into the metamorphoſis, propagation, or curious and intereſting manners of others, beſides the calls which my Family, and other important avocations have made on my leiſure; it has occaſionally happened that the marks of their connexion have been omitted, and the validity of ſuch notes conſequently leſſened.

Theſe I might probably have ſuppreſſed, if upon reviſal I had found general reaſon to be ſatisfied with the accuracy of the reſt; but the truth is, that many of them having been written in a curſory and interrupted manner, they fall ſhort of their primary intention, and if I was carefully to diſcard the imperfect, I am perſuaded none would remain.

Beſides it has ſo happened that I have been ſometimes more than ordinary remiſs, where I ſhould have particularly wiſhed to have been otherwiſe; but as I thank God I am bleſſed with a good recollection, I hope I ſhall not materially miſlead my Readers by truſting to it in certain inſtances, in which I may be induced to call in its aſſiſtance to ſupply the deficiencies of my Notes, either with reſpect to their ſubſtance or their connection.

And as it is probable I may find frequent occaſion ſo to do, I have thought proper to give this general warning of ſuch my intentions.

INTRODUCTION.

AMONGST the numerous Authors who have variouſly engaged their pens and pencils in the ſervice of natural Hiſtory; few I ſhould ſuppoſe if any have ſo entirely failed in their deſign, as not to have in ſome degree advanced this favorite Science.

The imperfection or want of method which may be aſcribed to ſome of the beſt, is in my opinion the leſs to be regretted, if we find reaſon to ſuppoſe that too ſtrict an attention to regular arrangement, would have abſorbed much of that time, which has been employed in preparing a greater quantity of materials, in favor of further progreſs.

Had it not been for the works of Petiver, Goedart, and other promiſcuous Writers, the World would hardly have been at this time favored with the ſyſtematic productions of Linnæus, Scopoli, Fabricius, &c.

Nor are the Writers of leſſer note to be utterly diſregarded; for tho' the labors and faculties of ſuch may appear confined, they may however be found competent to furniſh many uſeful hints, to more able Enquirers.

Encouraged with theſe perſuaſions, and convinced that the rage for ſyſtem has in this Age, prematurely obtruded haſty productions on the World; I am bold to ſubmit the following obſervations to the candor of the public eye.

If all who have leiſure and genius would liberally communicate the reſult of their reſearches, how greatly would the progreſs of this ſcience be advanced! what a fund of new materials would be acquired, for the entertainment and inſtruction not only of young beginners, but of Proficients alſo; who by juſt attention to the characters exhibited in ſuch an aggregate, might thence derive conſiderable aſſiſtance in ſubdviding ſuper-abundant, or connecting ſcanty Genera; in correcting errors, reſolving doubts, and eſtabliſhing proprieties in former ſyſtems.

The ſcience of natural Hiſtory is not as yet arrived at that pinnacle of perfection, not to be improvable even by the weak efforts of humble Admirers.

In the animal kingdom, the Vermes for inſtance, a numerous and complex race, are very imperfectly known by us.

Linnæus

Linnæus has attempted to ſubjugate them to certain rules of his ſyſtem; I ſay attempted, for that he did not conſtantly ſucceed, will I apprehend be readily granted, and his failure may probably be imputed to the want of that previous acquaintance with them, which was neceſſary to the better ſucceſs of ſuch an attempt.

For my own part, I ſhould rather ſuppoſe, that our knowledge of theſe Animals is not as yet mature for ſyſtem, and that therefore it is adviſable to give many of theſe a particular attention, rather than haſtily to decide on their general connections.

Inſects, probably from being more obvious and inviting, have been more generally attended to; yet even amongſt theſe, it is likely many characters are concealed, which, if detected, would occaſion ſtrange revolutions in modern ſyſtems: The publications of Fabricius may lead us to ſuppoſe this.

In purſuing the hiſtory of theſe little Animals, the attention is agreeably directed to their various modes of feeding, and of breeding; from the knowledge of which we may gather hints, for guarding againſt the depredations, or leſſening the numbers of the noxious; or for procuring, preſerving, and encouraging the increaſe, of more pleaſing and inoffenſive kinds.

On the former of theſe points, the ingenious Author above named has thrown a conſiderable light; and appears to have paid a very minute attention to the different conſtructions of their mouths: The characters hence derived, may be regarded amongſt the moſt natural; and the Pygmy race are aggrandized in the idea of their being diſtinguiſhable in a manner ſo ſimilar to that, by which larger Animals have been already diſcriminated; their reſemblance to which appears the ſtronger, in the conſideration that they are alſo variouſly adapted to the habitation of Earth, Air, or Water; and diverſly endued with diſpoſitions for rapine, or more placid life.

From ſome ſimilarity of manners, we may proceed to compare certain of the Spider race with Lions or Wolves; others of the ſame race which inſidiouſly creep and ſpring upon their prey by ſurpriſe, with Tigers; the great Libellæ in the aquatic ſtate of Larva, with Alligators; the ſame inſects in the Fly ſtate, Hornets, and others of the larger rapacious winged tribe, with Eagles, Waſps with Hawks; and the Ichneumon with the Cuckoo.*

And as to external characters, the attention to theſe, beſides the pleaſure it affords in the contemplation of varied beauties; may moreover be conſidered as a proper prelude, to a more cloſe obſervation and compariſon of their ſeveral manners and cuſtoms; ſince amongſt theſe externals, we are taught to ſeek for thoſe marks, according to which, the ſubjects have been diſtinguiſhed by different Syſtematiſts: and altho' the labors that theſe Authors have ſeverally beſtowed, would be ill requited with cavil at every ſlight imperfection, which eyes leſs engaged may find leiſure to detect; and that an

* The generality of Ichneumons admit of ſome compariſon with theſe ſubtile Birds; but I here mean to allude particularly to thoſe Species, which depoſit their eggs in the eggs of other Inſects, thus ſupplanting the proper offspring by the introduction of their own.

a. Lin. Syſt. Nat. T. 2. p. 940 No. 73. Ichneumon Ovulorum. & Lin. Faun. ſuec. No. 1644.

an attempt to render theſe labors uſeleſs, by a total ſubverſion of their productions, might juſtly be deemed an illiberal attack; yet I apprehend it cannot be denied, but that even in the beſt of our ſyſtems, there are errors of that magnitude as to require correction, difficulties which plead for ſolution, and chaſms which demand ſupplies.

Obſervations ſomewhat ſimilar to theſe, may be found to hold good with reſpect to Vegetables, eſpecially the *cryptogamia*; and to other Subjects of nature.

Is it not then a time to call on thoſe who have leiſure and genius for theſe purſuits to lend an aſſiſting hand? and by a diſplay of ſuch marks as each may reſpectively prefer, to ſubſcribe to a general fund, for the gradual abatement of the imperfections complained of?

I wiſh my endeavors may tend to elucidate, and intereſt others † to purſue theſe inveſtigations; that in the courſe of theſe they may be bleſſed with tranquility; ſecluded from the carking cares, and galling paſſions of the World, and gently conducted thro' paths of preſent content and peace, towards the permanent enjoyment of Truth and Happineſs.

Feeble as my efforts may be found, yet whilſt under the influence of ſuch deſires, I truſt I may rely on a favorable reception from the britiſh Public.

† In a ſmall work (the Aurelian's vade mecum) lately publiſhed, I have taken occaſion to invite the Ladies to engage in the pleaſing ſtudy of natural Hiſtory, I here wiſh to enforce the invitation, perſuaded that the ſcience might derive conſiderable advantage, and themſelves much gratification, from the exertion of their kind endeavors to promote its progreſs.

OBSERVATIONS

ON

MARINE VERMES, INSECTS, &c.

No. I. v. TAB. I. FIG. 1.

*§ ACTINIA.		SEA-FLOWER.	
CARYOPHYLLUS.	A. dianthoides, rubro-fuſca; flore pleno.	CLOVE.	S.-F. Like the Dianthus, red-brown: with a double flower.
	An Dianthi Varietas?		Is it a variety of the Dianthus?

AS many who have not viſited the Sea Coaſts, are unacquainted with this race of Animals, it may not be amiſs to mention a few particulars concerning them.

I ſuppoſe the name ACTINIA is derived from the Greek word ΑΚΤΙΝ, which ſignifies a ray; and has been given to them, on account of their numerous divergent tentacula; and that their ſtrong reſemblance to a flower, when theſe

 tentacula

* v. Apology in Preface.

§ The ACTINIÆ are ranked in the *linnæan* Syſtem, in the VIth Claſs of Animals, viz. VERMES, and in the IId. Order, MOLLUSCA.

CLASSIS VI.
VERMES.

TARDIGRADA, mollia, pandentia, vivaciſſima, redintegranda, humidi Animantia, *acephala, apoda, androgyna, Tentaculis* dignoſcenda.

IMPERFECTA veteribus, nec inepte, dicta animantia, deſtituuntur Capite, Auribus, Naſo, Oculis pleraque, Pedibus, ab Inſectis itaque diverſiſſima, a quibus dudum removi naturæ cryptogama: ſunt *Inteſtina, Molluſca, Teſtacea, Lithophyta, Zoophyta.*

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CLASS VI.
WORMS.

Slow of motion, ſoft, expanſive, tenacious of life, from parts becoming whole, Enliveners of moiſt places, without head, without feet, androgynous, diſtinguiſhable by their tentacula.

By the Ancients, not without ſome *(tho' falſe)* appearance of grounds, reputed imperfect Animals; being deſtitute of Head, Noſe, and moſtly of Eyes, and Feet; very different therefore from Inſects, from which I have lately diſtinguiſhed theſe ſubjects of ſecret, myſterious generation. They are, *I. Gut-ſhaped, II. Soft, III. Shell-worms, IV. Lithophytes, V. Zoophytes.* - - - - -

tentacula are extended, and themſelves expanded, has obtained them the *engliſh* title of Sea Anemone.

From this ambiguity of their appearance, ſeems to have ariſen a diverſity of opinions reſpecting their nature; ſome having ſuppoſed them Vegetables: but their locomotive power, method of feeding, and other circumſtances, ſufficiently evince the contrary perſuaſion, that they are real Animals.

Their tentacula ſerve them (if not with eyes to diſcover, which I ſuſpect they may; yet) as hands to retain their food, and direct it to their central mouth.

They have been frequently mentioned as partaking of the extraordinary faculty of increaſing by cuttings, like freſh water Polypi; it is however probable all are not equally endued with it, for in an experiment tried, tho' I recollect that the pieces continued a long time, I ſuppoſe 8 or 10 weeks or more, in ſeparate exiſtence, yet neither in this inſtance nor in any other, do I remember them to have attained perfection: at the ſame time I confeſs my own experiments have not qualified me to ſpeak much to this point of their hiſtory.

They differ in ſhape, ſize, color, and even in diſpoſition: ſome ſeem to prefer a ſituation near the ſhores, others in the more diſtant deeps: ſome in part concealed in the ſand, or crevices of the rocks; others more expoſed.

The

II. MOLLUSCA.

Animalia *ſimplicia* nuda, *(abſque Teſta inhabitata)*, *artubus inſtructa*, vagantur pleraque per maria. cœlo reſplendentia, tanquam totidem lucernis tenebricoſum illuminant abyſſum Phoſphorea, ut quod eſt inferius, ſit tanquam ſuperius.

ACTINIA.

Corpus ſe affigens baſi, oblongum. teres apice dilatabili intus tentaculato.

Os terminale dentibus incurvis; *Roſtro* cylindrico radiato.

(Apertura præter os nulla.)

v. Lin. Syſt. Nat. T. I. p. 1069. 1081. & 1088.

Fauces hæc Animalia, ſubtus ſacci inſtar penitus clauſa, ſuperne habent pro libitu tam patulas, ut mytilos ſatis magnos aliaſve conchas ingurgitent, e quibus modo nos fugiente, piſces extrahere, & evacuatas teſtas per eandem aperturam, ejicere rurſus valent. Quæ teſtæ ſi majores ſint & ægre per fauces tranſituræ eſſent, ---- non ſolum fauces late expandit, ſed eaſdem ut ſolemus tibialia, quaſi invertit, quo ſpatium brevius & apertura fit latior. Eundem in aquæ dulcis Polypis motum obſervavimus.

v. Baſt. opuſc. ſubſec. p. 122.

II. SOFT.

Simple, naked *(without teſtaceous habitation)*, *furniſhed with Limbs*, moſtly inhabitants of the Seas, *and* glittering with light, with their phoſphoreous quality illuminating the dark Abyſs, ſo that what is there below, may be as if above.

SEA-FLOWER.

Body affixing itſelf at the baſe, oblong, round; Top dilatable, internally tentaculated:

Mouth terminal with incurved teeth; Roſtrum cylindric, radiated.

(No Aperture except the Mouth).

Theſe Animals, imperforate at the baſe, have at top ſuch extenſible Mouths, as to take in pretty large Muſſels, or other Shell-worms; from which, in a manner unperceived by us, they have the power to extract the Animals, and return the vacant Shells through the ſame Aperture: which Shells, if of ſo large a ſize as hardly to be paſſed through the mouth, the Animal not only dilates its mouth, but as it were turns it inſide out, ſomewhat in the manner that we do ſtockings; by which means the ſpace becomes ſhorter, and the Aperture wider. We have obſerved the ſame circumſtance in freſh water Polypi.

The colors of ſome are vivid and beautiful to a degree; roſe color, blue, purple, green, yellow, &c, variouſly adorn the different Species. Their tentacula, from which no inſignificant part of their beauty is derived, vary alſo conſiderably.

Mr. * Ellis long ſince deſcribed a particular Species, under the titles Actinia dianthus, or Sea carnation, titles admirably adapted to diſtinguiſh thoſe kinds, whoſe laciniated edges, give them a ſtrong reſemblance to the flowers of that Genus.

I have purſued the Idea, and denominated mine CARYOPHYLLUS; and have in the ſhort deſcription, compared it to the DIANTHUS.

I recollect three different kinds of ACTINIÆ, which may be conſidered as of this Family; the CARYOPHYLLUS juſt mentioned; a large white Species, which I take to be the true ACTINIA dianthus of Ellis, and another of a pink color: the latter very plentiful under ſhelter of the rocks near the Dawliſh ſhore, not very diſtant from this place; whereas of the two former, I recollect few if any, that have not either been dredged from the deeps, or perhaps caſt on ſhore by very tempeſtuous Seas.

Muller would probably have conſidered all theſe as varieties of the § plumoſa; but if this was the caſe, they would I ſhould ſuppoſe be found in more promiſcuous ſociety.

In Animals ſo little known, it is difficult to preſerve the due medium, between treating Varieties as diſtinct Species, or diſtinct Species as Varieties; and perhaps he has run into the latter error.

To determine the real ſpecific characters, would require a very cloſe attention; and I ſhould think conſiderable aſſiſtance may be gained, by obſerving the various forms, proportions, numbers, and diſpoſitions, of the tentacula; and as theſe curious Animals are generally poſſeſſed of attractive novelty and beauty, I hope ſome of my Readers in their viſits to the Sea-coaſts, will be induced to examine and compare them; and that at ſome future time, I ſhall myſelf be enabled to throw further lights on the ſubject.

* v. Ph. Tr. 1767. p. 436. tab. XIX. fig. 8.
† DIANTHUS in Botany is the generic title of Pinks and Carnations.

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§ 2791. ACTINIA *plumoſa* tentaculis parvis, margine penicillis cirrata.

Variat colore caſtaneo, luteo-fuſco, luteo-virenti, & albo; maxime pellucida & opaca; laciniæ faucis quoque variant albæ, rufæ, aurantiæ. - -

- - - - veras Actiniarum notas differentiales auctores nondum aſſecuti ſunt.

v. Mull. Verm. Moll. Hydra. Actin.

SEA-FLOWER *plumous*, the margin fringed with cluſters of ſmall tentacula.

Varies in color, cheſtnut, yellow-brown, yellow-green, and white, and in being very tranſparent or opaque; the fringes alſo vary in being white, red, and orange colored.

Authors have not as yet diſcovered the true ſpecific diſtinctions of Sea-Flowers.

No. II. v. Tab. I. Fig. 2. a. 2. b. & 2. c.

* SIPHUNCULUS.
Corpus teres.
Cauda tumeſcens.
Collum extenſile.
Os laciniatum.
§ *Anus?* (Animalis quieſcentis contracti,) anterior.

NUDUS. S. flaveſcens; *Caudâ* pallidâ, *Collo*-que pallidiore fuſco punctatis: *Ano?* vix conſpicuo.

§ *Apertura* lateralis Lin? v. Fig. 2. b—b. b.

* TUBE-WORM.
Body long and round.
Tail frequently ſwelling.
Mouth fringed.
§ *Anus?* (when the Animal is quiet and contracted,) anterior.

NAKED T. yellowiſh; at each end pallid, and dotted with fuſcus: *Anus?* hardly conſpicuous.

§ the lateral *Aperture* of Linnæus? v. Fig. 2. b—b. b.

UPON handling this Animal it became turgid; v. f. 2. c I obſerved on it a ſmall riſing, obliquely croſs-barred, v. f. 2 c. c. c this was probably a bliſter on the ſkin, (which it ſeems as if this Genus have a power of raiſing) and

* SIPHUNCULUS, anglice little Tube.

* The Siphunculi are ranked in the *linnæan* Syſtem in the 6th Claſs of Animals, viz. VERMES, and the Iſt Order MOLLUSCA.

ANIMALIA
CLASSIS VI.
VERMES.

INTESTINA Animalia nuda *(ſimplicia, abſque artubus,)* terrena quondam dicta, ob ſummam ſimplicitatem corporis, terebrant omnia; perforat *Gordius* Argillam, ut aqua tranet; *Lumbricus* Humum ne ſitu corrumpatur; *Myxine* Cadavera ut liqueſcant; *Teredo* Ligna, ut deſtruantur; quemadmodum Pholades, & Mytili lithophagi Petras, ut ſolvantur. - -
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279. SIPUNCULUS. *Corpus* teres, elongatum.
Os anticum, attenuatum, cylindricum.
Apertura lateralis corporis, verruciformis.

nudus. 1. S. corpore nudo.

- - - - - - - -
Habitat in Oceano Europæo, *ſub lapidibus.*
v. Lin. Syſt. Nat. T. 1. p. 1069. 1075. 1078. &c.

† In

ANIMALS
CLASS VI.
WORMS.

DIV. I.

GUT-SHAPED. *Simple* Animals, naked, and without limbs. Formerly reckoned with Earthworms, on account of the great ſimplicity of their bodies; they pierce all things; the *Gordius (Hair-worm)* the Clay, that the water may paſs through; the *Lumbricus (Earth-worm)* the Ground, leſt it ſhould become mouldy and corrupt; The *Myxine (Hag)* Carcaſes, that they may diſſolve; The *Teredo (Piercer,* or *Auger-worm?)* Logs of Wood, that they may be deſtroyed; even as the Pholades (Dactyls); and the Stone-conſuming Mytili, perforate the rocks, that theſe alſo may periſh.

TUBE-WORM. *Body* long and round.
Mouth anterior, attenuated, cylindric.
A puſtular *Aperture* on the ſide of the body.

naked T. Body naked.

- - - - - - - -
Inhabits the europæan Ocean, *under ſtones.*

† We

and not the Apertura lateralis mentioned by Linnæus, which I have rather conſidered as the Anus. v. f. 2 b—b. b—I recollect however to have ſeen a Siphunculus caſt out an excrementitious matter through that part, which I ſtill conſider as the Mouth: It is poſſible that like the Actiniæ, it may receive its food and return its *Fæces* through the ſame Paſſage, and that what Linnæus has called Apertura lateralis, if really perforated, is adapted to ſome other purpoſe.

From the Sea Side near Teingmouth.

Though one ſhould not ſuppoſe this Species very uncommon, as having been noticed by ſeveral Authors; yet I do not recollect to have obſerved it in theſe parts before laſt year; nor although I have had opportunties of noticing ſeveral to have ever known it much if at all exceed the length of the figures 2 a, 2. b, and 2. c, notwithſtanding the great ſize aſcribed to it by Rondeletius.†

The figures are deſigned to repreſent it under different appearances; 2. a. with the Mouth concealed; 2. b. the Mouth extruded;—the Tail appearing more ſwollen and bearded—2. c, in a turgid ſtate the appearance of the tail altered; the point not ſimple.

† In luto Maris & marinorum ſtagnorum vivere comperimus eum Vermem ---- qui ------ aliquando duorum cubitorum magnitudinem æquat polliciſque craſſitudinem. Farciminis longi figuram refert. roſtro eſt ---- longiore, - - - - ſimili Hippocampi roſtro, unde μακροφυγχοτερον nuncupavimus.

Intus longum duntaxat Ventriculi, vel inteſtini ductum habet, aqua & luto pleni: unde perſpicuum eſt his tantum veſci ----------

v. Rondel. de Inſectis & Zooph. liber p. 110.

† We have found that this Worm, which ſometimes attains the length of two Cubits, and the thickneſs of one's thumb, lives in the mud of the Sea, and of ſalt water Lakes. In figure it reſembles a long ſauſage; the beak long, reſembling that of the Hippocampus, on account of which we have named it μακροφυγχοτερον, (*which with the inſertion of a π, may be underſtood long-quill-ſnouted*, or *having a long tubular ſnout*:)

Internally it has only a ventricular or inteſtinal duct, full of mud and water: whence it manifeſtly fed on theſe alone.

No. III. v. Tab. 1. Fig. 3.

* SIPHUNCULUS.	* TUBE-WORM.
RETICULATUS. S. faccatus Lin? pallide fuſcus, ſulcis annularibus, Striiſque longitudinalibus reticulatus; æneo viridi ſplendidus, et ad utramque extremitatem cinereus; *Cauda* nitida:	RETICULATED. T. pale brown, reticulated by annular furrows and longitudinal ſtreaks; and ſhining with reflections of braſſy-green; at each extremity aſh-colored: Tail highly gloſſy.
§ *Ano?* conſpicuo, radiato.	§ *Anus?* conſpicuous, radiated.

* For generic characters, &c. v. No. II.
§ v. Tab. I. Fig. 3. a. a.

IT is probable that few, contemplating this Animal in a ſtate of Health only, would ſuppoſe it the Species, to which the *linnæan* name and deſcription refer.§

Though I have frequently and cloſely obſerved it, I was long perſuaded of the contrary, and inclined to conſider it as undeſcribed by that Author, had accordingly given in the title *reticulatus*, from characters more readily conſpicuous than that, on which the *linnæan* title *ſaccatus* is founded.

That the epithet *laxa*, *looſe* or *ſlack*, ſhould be applied to a covering ſo nicely fitted, ſo preciſely accommodated to the Animal, in the various ſhapes which it aſſumes; may I apprehend be accounted for, by ſuppoſing the imperfect preſervation of perhaps the only ſpecimen that Linnæus ever ſaw; to which the deſcription

§ faccatus 2. S. corpore tunica laxa induto.
Habitat in Oceano Indico.
Structura *refert antecedentem, præter cutim membranaceam laxam, diaphanam,* qua animal includitur.
v. Lin. Syſt. Nat. T. I. 1078. 279. 2.

Cloaked T. the body cloathed with a looſe covering.
Inhabits the indian Ocean.
It reſembles the preceding, *(nudus)* but incloſed in a looſe, membranaceous, tranſparent pellicle.

deſcription and figure in the Amœnitates academicæ ‡ refer: the figure favors the ſuſpicion, by repreſenting the pellicle as if torn.

In ſuch as I have kept, I have frequently obſerved bliſters, which I have before || ſuppoſed uſual in Animals of this Genus; I ſuſpect theſe were increaſed by the putridity of the water.

It was in a ſtate of diſeaſe or diſſolution, that I particularly remarked a more than ordinary detachment of this covering; which upon trial eaſily ſeparated from the creature, tho' more adheſive towards the tail, and not without expence of ſome liquid, diffuſed in its ſeparation. The appearance of the anterior part of the worm after the loſs, was ſo much the ſame as before, that I think common obſervation would hardly have miſſed it.

In the Amœnitates academicæ‡ this creature is numbered with *chineſe* rarities, and I believe few Authors have hitherto acknowledged it as an inhabitant of our own Seas.—I have however frequently met with it after rough weather, in the neighbourhood of this Place, where, according to my Obſervation it is conſtantly a larger Species than the *nudus*.

It is a noiſome Animal; the frequent offenſive ſmell which it emits in confinement, being no certain ſign of its being dead, but rather ſeeming to ariſe from its natural tendency to corrupt the water, and to retain the putrid ſtench, even after its removal out of it.

It will ſurvive a conſiderable degree of putridity in the water if not too long continued; for though it may bliſter, and protruding its mouth exhibit its laciniated Fauces; yet it is much but the very offenſive exhalations ſuggeſt the convenience of changing the water in due time for the preſervation of the Animal's life.

Should not this Worm and the S. *nudus*, on account of the laciniæ about the head, be rather ranked with the *Molluſca* than with the *Inteſtina?* If their Gut-like

‡ CHINENSIA LAGERSTRÖMIANA.

39. NEREIS (facculo induta.) *Fig.* 5.

Hoc animal maxime ſingulare, quaſi medium inter Hirudinem & Nereiden cæruleam, nitidum, altera extremitate attenuatum tubo cylindrico, brevi. *Corpus* conſtat cylindro craſſiore, induto membranæ pellucidæ, laxæ nec adhærenti, decuſſatim ſtriato; Hujus membranæ altera extremitas, animali interiori longior, ventricoſa, longitudinaliter ſtriata.

v. Amœn. academ. Vol. 4. p. 254, Tab. III. 5.

|| v. No. II. p. 4.

‡ CHINESE LAGERSTRÖM's COLLECTION.

39. NEREIS (cloathed with a little bag). *Fig.* 5.

This very ſingular Animal, as it were the connecting Link between the Leech and the blue Nereis, is ſplendid; and tapering at one end into a ſhort cylindric Tube: The body is likewiſe cylindric but thicker; cloathed with a looſe tranſparent membrane, not adhering, ſtreaked croſſwiſe; at the further end longer than the Animal incloſed, ſwollen, and ſtreaked lengthwiſe.

Gut-like ſhape be objected, would not the ſame objection remove the HOLOTHURIA *inhærens* from its preſent place (No. 2811) in Muller's arrangement ?‖

cutc molli contegitur, tota inciſvris conſtante os vel roſtrum obtuſum eſt, parumque prominet, unde μικροσυγχοτερον cognominavimus.

Aliis roſtrum deeſt, ſed foramē tantū habent, capeſſendi cibi gratia. Totus Vermis digitali eſt magnitudine minimique digiti craſſitudine.

v. Rondel de Inſect. & Zooph. Lib. 109.

It is covered with a ſoft ſkin, marked with numerous inciſures. The Mouth or Beak is obtuſe, and juts out but little, whence we have called it μικροσυγχοτερον, *which with the inſertion of a* π, *as before, may be underſtood ſmall-quill-ſnouted,* or *having a ſmall tubular ſnout.*

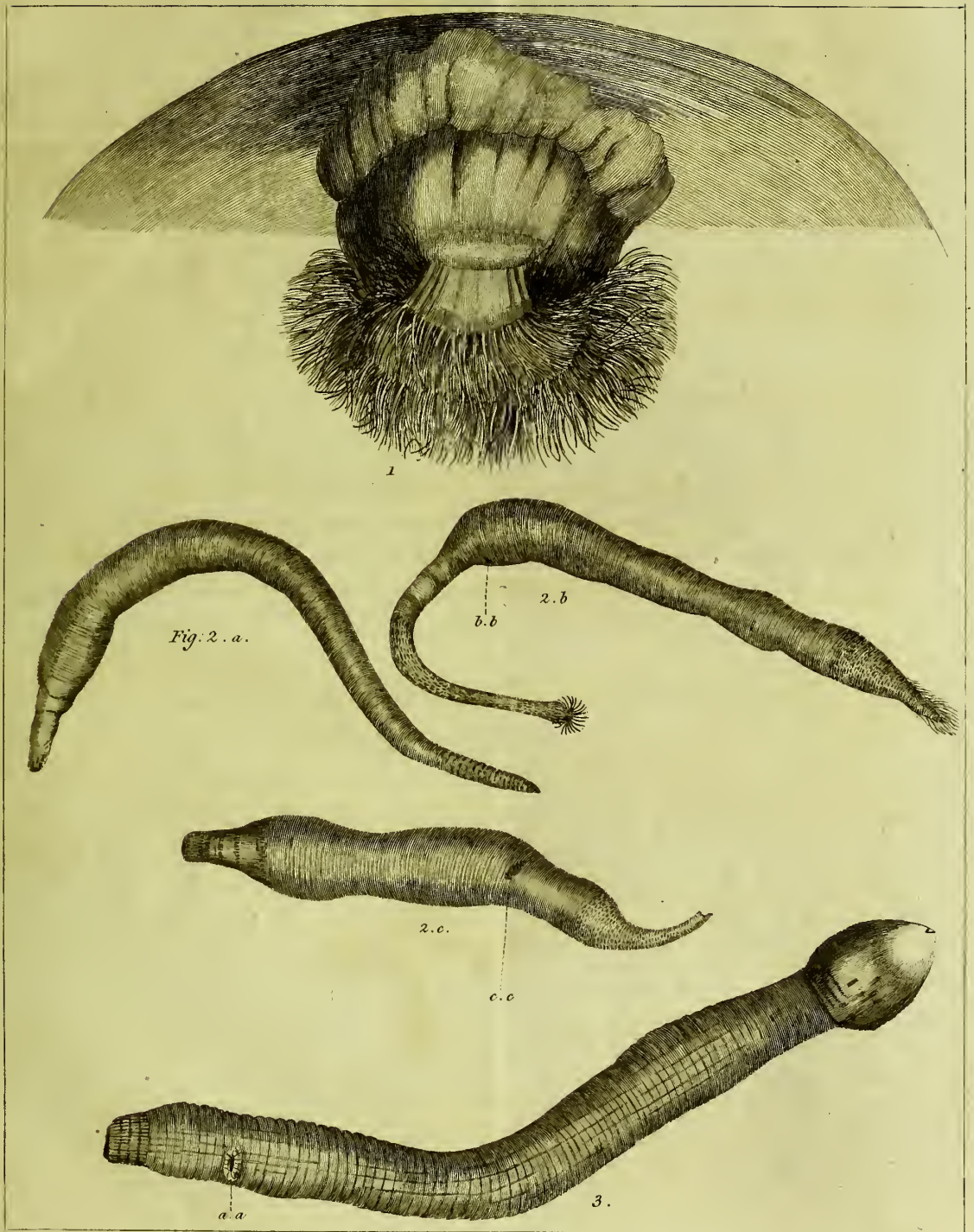
Others, wanting the beak, have only the hollow paſſage whereby to receive their food. The whole Worm is of a Finger's length, and of the thickneſs of a little finger.

‖ v. Muller Zool. dan. Prod. No. 2811. T. XXXI. f. 1—4.

T A B. I.

Fig. 1. of the ACTINIA *Caryophyllus* fixed to the ſide of the Baſon.
2. a of the SIPHUNCULUS *nudus* with the Mouth concealed.
2. b of ditto with the mouth extruded, the tail more ſwollen, and bearded.
2. c of ditto in a turgid ſtate.
3. of the SIPHUNCULUS *reticulatus*—ſaccatus Lin.

Pl. 1



N.M. del.

Peter Mazell Sculp.

THE ſlight diſcuſſion of the *Subjects* in the few preceding pages, may aſſiſt in awakening our ſurpriſe, that two races of Animals, as diſtinct as thoſe of INSECTS* and WORMS, ſhould have been ſo much confounded by the reciprocal miſapplication of their titles; to which the appearance of certain Inſects in the Larva, and our too general neglect of things which we inadvertently conſider as beneath our notice, have probably contributed.

But in fact nothing created *is* beneath our notice; for whether we contemplate the ethereal regions, and from the Spheres therein revolving, derive an accreted conviction that doubtleſs there is a Supreme Being who governs the Univerſe; or from the nearer ſurvey of things more immediately about us, increaſe our proper confidence in his particular Providence, which the much neglected Lillies of the Field, are if duly conſidered abundantly ſufficient to teſtify; we are benefited in either caſe.

And as with the help of glaſſes, we proceed in inveſtigating more minutely, we receive reiterated aſſurances of theſe univerſally atteſted truths; we learn to lay aſide our prejudices, and to admire what we before deſpiſed.

The advantages which have in this age accrued to natural hiſtory, from the attention that has been paid to minute characters, give encouragement to our perſeverance.

The Antennæ of INSECTS, complicated, various, and exquiſite in ſtructure, have largely contributed to the method, which at preſent illumines their hiſtory; but our curioſity with reſpect to the particular uſes of theſe delicate inſtruments, remains unſatisfied.

 The

* INSECTA.

ANIMALCULA polypoda, *Spiraculis* lateralibus reſpirantia, *Cute* oſſea cataphracta;

\- - - - - - - - - -

CORPUS horum dividitur in *Caput*, *Truncum*, *Abdomen*, *Artus*:

CAPUT pleriſque diſtinctum, *inſtruitur* Oculis, *Antenis*, ſæpinſque Ore; - - - -

v. Lin. Syſt. Nat. Tom. 1. p. 533, &c.

* INSECTS.

ANIMALS of a ſmall ſize furniſhed with ſeveral feet, breathing thro' lateral Spiracula, and defended with a hard ſkin like a Coat of Mail. - -

Their Body divided into Head, Trunk, Abdomen, and Limbs:

The Head in moſt is diſtinct, and furniſhed with Eyes, Antennæ, and moſt commonly with a Mouth.

\- - - - - - - - -

Compare with the linnæan account of VERMES.

The pectinated Antennæ which diſtinguiſh ſome kinds of Moths, eſpecially the Males, are doubtleſs adapted to their peculiar exigencies: Now if we may be allowed to conjecture that the branches of theſe by communication with, and through the common Stem, convey to the Senſorium, the vibration of ſounds, or perception of ſmells, which in their various inclinations multiplied by the general inflections given by the Inſect to the whole, they may be ſuppoſed capable of receiving; what an idea does this encourage, of their acute and extenſive ſenſibility.

I recollect a Moth of this kind flying into the houſe, and as it continued fluttering about, I ſoon ſuſpected its viſit might be owing to another of the ſame Species, being recently emerged from a chryſalis which I had ſhut up in a box: on examining the box I found the Moth which I expected; and on introducing them to each other, had reaſon to think my ſuſpicions as to the occaſion of the viſit, well founded. Mr. Harris's explanation of the curious art of ſembling, a method of decoying male Moths with a female confined,§ favors the credibility of this account.

By what ſenſe can we conceive theſe Moths thus directed, ſo likely as by that of ſmell? where then may we trace the organs of this ſenſe? in the Antennæ? in the Palpi? or where?

That the Inſects juſt mentioned which appear to poſſeſs this ſenſe in ſo eminent a degree, have alſo ſuch remarkable Antennæ ſeems in favor of the former ſuppoſition; But as in many Species, theſe inſtruments are ſo delicately extended, muſt not the tremulous motion of the air occaſioned by ſounds, neceſſarily affect them? And if ſo ſhall we ſuppoſe them the compound vehicles of two diſtinct Senſes, and attribute none to the Palpi? for the idea of the latter being *Feelers*, I confeſs I do not rightly underſtand. I have frequently amuſed myſelf with obſerving, and ſometimes with drawing the Antennæ of dipterous Inſects; and ſhould think that in their great variety, ſome good characters for the better diviſion of this Claſs, might be found.

For the examination of theſe, and ſuch like minutiæ, a pocket magnifier for the fields, and a microſcope at home, are ready Aſſiſtants; and in order to draw them more eaſily, I would recommend a ſmall Camera to be uſed with the ſolar Microſcope, conſtructed ſomewhat in the following manner.

A ſmall oblong box, of proportionate width and breadth,* open at one end; towards the other end place a piece of looking-glaſs at an angle of 45, over which

§ v. Har. p. 53.

* The ſize or proportion of the box may be varied according to the intended uſe; or as the materials are cheap and obvious, it may be ſtill more convenient to have two or three of different ſizes: mine is about ſix inches long, upwards of three inches wide, and above two inches high in the clear.

which lay a piece of plain glaſs and upon this a piece of thin oiled paper, all which ſhould be ſo exactly fitted as for the oiled paper to lie juſt level with the edges of the box, and to be kept ſteady by the hinder part of the cover, when ſhut and faſtened down : this hinder part of the cover for a little more than half the length, being made to turn back on a hinge towards the front ; and having a circular hole about the middle of it, an inch or more in diameter.

In uſing this box at about two or three feet diſtance from the microſcope, more or leſs according to the ſize of the object, or otherwiſe at diſcretion, and adjuſting the Focus accordingly ; place it ſo, as that the ſhadow of the object may be received through the open end, reflected by the ſpeculum through the piece of plain glaſs, and appear on the oiled paper within the circle : then trace the outline with a pencil, and expreſs it as exactly as may be on a piece of proper paper ; after which finiſh ſhading, &c. by imitation from the common microſcope.

By due regard to natural characters, we may hope to increaſe our knowledge of natural ſubjects ; and if we deſire to preſerve, and communicate clear ideas of things, we ſhould cautiouſly guard againſt miſnomers : Inſects therefore ſhould no longer in any ſtate be called Worms, nor Worms Inſects ; neither ſhould Lobſters, Crabs, Shrimps, Oyſters, Cockles, Muſcles, &c. be confounded with Fiſh ; ſince the three firſt are acknowledged as INSECTS, and the latter more properly included amongſt the WORMS.

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