

**Observations on the structure of the intestinal worms of the human body ...  
Wherein is given a particular account of the Trichuris. Which obtained the  
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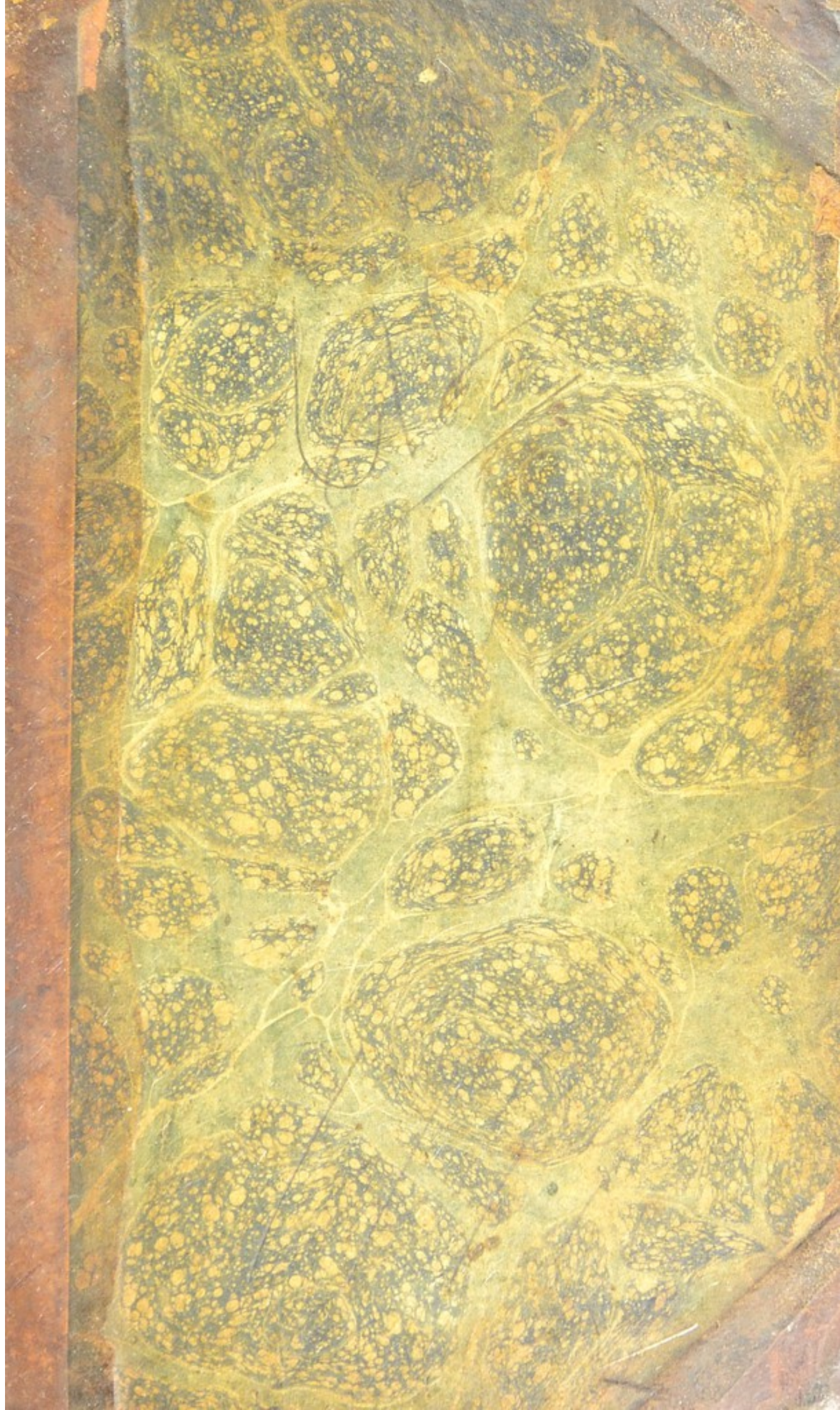
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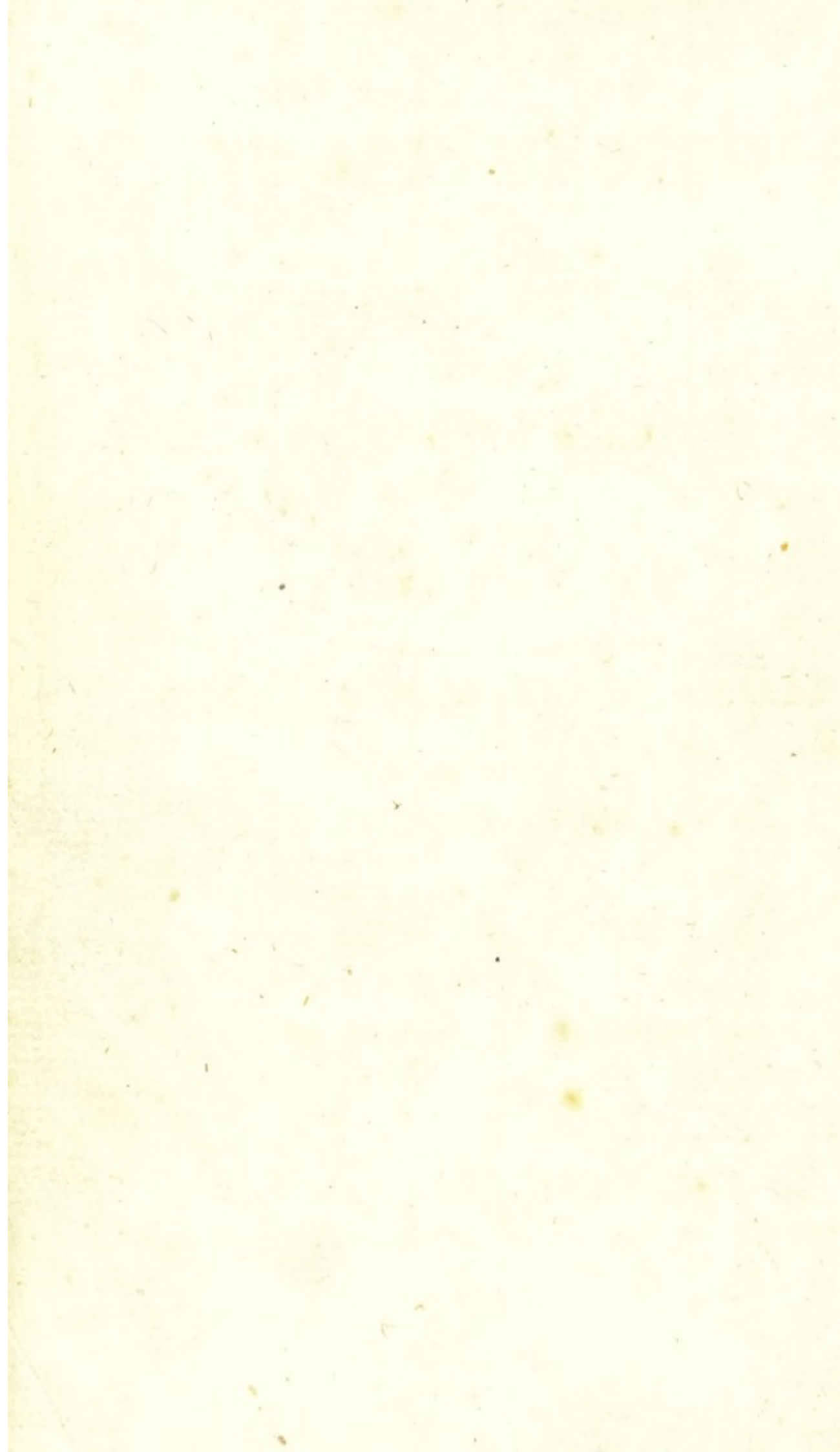


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OBSERVATIONS  
ON THE  
*Structure of the Intestinal Worms*  
OF THE  
HUMAN BODY:  
BEING  
AN ATTEMPT  
TO ARRANGE THEM IN  
CLASSES, GENERA, AND SPECIES.  
WHEREIN IS GIVEN  
A PARTICULAR ACCOUNT  
OF THE  
*TRICHURIS.*

WHICH OBTAINED THE MEDICAL SOCIETY'S  
PRIZE-MEDAL, 1798.

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By R. HOOPER, M.D. F.L.S. &c.

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1799.





# OBSERVATIONS

ON

HUMAN INTESTINAL WORMS, &c.

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IT is a fact equally well known to physicians and philosophers, that the human body contains in its interior, different species of worms. These worms are also known to produce diseased states of the bodies in which they inhabit, and to become the source of innumerable evils. To inquire therefore into their anatomy and economy, and to point out their peculiarities, is a matter of no small importance, but, on the contrary, may contribute to establish a more rational method of cure in diseases produced by these worms. The descriptions of writers on this subject are frequently discordant, and we have yet



to lament the want of an arrangement, which shall distinctly point out the specific characters by which each worm may be distinguished. To obviate these inconveniences, and to reduce to order what has hitherto been much confused, I have, in the following sheets, endeavoured to lay down some observations towards establishing an arrangement of human intestinal worms. It is my intention also, at some future period, to prove, that the human intestinal worms are of themselves distinct from all other worms, and only inhabit and propagate in the human *primæ viæ*.

The motives, which induced me particularly to consider this subject were, the very frequent applications made to me by the numerous and indigent poor who applied to the institution to which I have the honour to belong, for relief in diseases produced by these animals. At this place, sacred to the feelings of humanity, I have enjoyed every advantage that the extensive nature of my situation would permit. To this object my views have been directed for these eight years. In all the cases which have come under my care, and in all the dissections at which I have been present, whether of the human species, or of  
other

other animals, I have been uniformly desirous of investigating the nature of worms.

At some future period, should time and opportunity permit, I purpose laying before the public some observations on the different methods of cure in worm diseases, to which the present paper is preparatory; but, in consequence of being at present engaged in several literary undertakings, I am apprehensive it may be some time before I can arrange my papers and notes on this important branch of pathology.

It is now five years since I first discovered a new species of worm, the drawing of which, as well as of the other worms, was made by that ingenious artist Mr. Henry de Bruyn, by whose unremitting attention I am enabled to lay before the society the several drawings, the greatest part of which were taken from the microscope; but it was not till lately that I found that the same worm was first mentioned by Roederer, in the year 1760. To him the honour of the discovery is therefore due, "*longe mihi potior cura est veritatis quam novitatis*," (Morgagni). By him it was first called *Trichuris*, and under that name I have described it.



It is somewhat singular, that this worm should have escaped the notice of anatomists and physicians so long; and, although it is mentioned of late years by Wrisberg, Blumenbach, Goeze, and others, their descriptions will be found to vary considerably from that which I have given. I believe it to be entirely new in this country. It is nowhere mentioned in the works of any of our most celebrated anatomists and physicians, nor do the most eminent characters, with whom I have had frequent opportunities of mentioning this subject, ever recollect to have met with it in their practice; on which account it may, with propriety, be numbered among the discoveries of modern times. There are several specimens of this worm in the late Dr. Hunter's museum, but this great anatomist, engaged in pursuits which have immortalized his name, was ignorant of their being *Trichurides*, and believed them to be adventitious. By Dr. Baillie's kindness I have examined them, and find them, in every respect, similar to that which I have described.

The following observations are intended to point out the principal *phenomena* observable in these parasitical animals, as far as they are  
with

with certainty known. A great field remains yet to be explored, and, perhaps, at some future period, their nature and offices may be more generally and better known: “*nam multum egerunt qui ante nos fuerunt, sed non peregerunt; multum adhuc restat operæ, multumque restabit: neque ulli nato post mille secula præcidetur occasio aliquid adhuc adji- ciendi.*”—Seneca.

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Such is the nature and office of the human stomach and intestines, that insects and worms, or their ovula, may not unfrequently be conveyed into that canal with those things, that are continually taken as food; but such insects or worms do not live long, and seldom, if ever, generate in a situation so widely different from their natural one.

Besides these, there are worms, that are never found in any other situation than the human stomach or intestines, and which there generate and produce their species.

Thus it appears that the human stomach and intestines are the seat for animalculæ, which are translated from their natural situa-



tion, and also for worms proper to them, which live in no other situation, as I shall prove in the description of each species.

#### THE FIRST CLASS

Contains those worms, which are generated and nourished in the human intestinal canal, and which there propagate their species.

#### THE SECOND CLASS

Comprehends those insects or worms, that accidentally enter the human primæ viæ *ab extra*, and which never propagate their species in that canal, but are soon eliminated from the body; such are, several species of Scarabœi, the Lumbricus terrestris, the Fasciola, the Gordius intestinalis, and others.

The second class belongs to the province of natural history. The consideration of the first class is the subject of the present paper, which, from the variety it affords, I have thought proper to divide into different orders, genera, and species, and have attached such peculiarities as, eventually, will distinguish them from all others.

ORDER

ORDER I.  
THE ROUND WORMS.

GENUS I.  
INTESTINAL ASCARIDES.

*Character.*

Body round. Head obtuse and furnished with three vesicles.

*Species.*

ASCARIS LUMBRICOIDES. THE LONG ROUND  
WORM, OR LUMBRICOID ASCARIS.

*Character.*

When full grown, a foot in length. Mouth triangular.

ASCARIS VERMICULARIS. THE THREAD OR  
MAW WORM.

*Character.*

When full grown, half an inch in length.  
Tail terminates in a fine point.

GENUS

GENUS II.

INTESTINAL TRICHURIDES.

*Character.*

Body round. Tail three times the length of the body. Head without vesicles.

*Species.*

TRICHURIS VULGARIS. THE TRICHURIS, OR  
LONG THREAD WORM.

*Character.*

The head furnished with a proboscis.

ORDER II.

THE FLAT WORMS.

GENUS I.

INTESTINAL TAPE WORMS.

*Character.*

Body flat and jointed.

*Species*



*Species.*

TÆNIA OSCULIS MARGINALIBUS. THE LONG  
TAPE WORM.

*Character.*

The oscula are situated upon the margin of  
the joints.

TÆNIA OSCULIS SUPERFICIALIBUS. THE  
BROAD TAPE WORM.

*Character.*

The oscula are placed upon the flattened  
surface.

---

These worms were all known to the an-  
cients, the Trichuris only excepted, and are  
mentioned in the works of Hippocrates, Ga-  
len, Celsus, Paulus Ægineta, and Pliny.

## ORDER I.

## GENUS I.

*Species 1.*

## ASCARIS LUMBRICOIDES.

*Latin.* Lumbricus teres.*English.* The long round worm.*French.* Le ver strongle, le ver long et rond.

Ελμινς στρογγυλα of the Greeks.

## SYNONYMS.

Lumbricus teres. *Clerk histor. lumb. lator. p. 229.*———— intestinalis humanus teres. *Klein. herpet.*  
*p. 62.*———— intestinalis. *Pallas dissert. de infr. vivent.*  
*p. 13. n. 4.*Ascaris lumbricoides. *Linnei system. natur. p. 1076.*———— Mulleri histor. vermium. *p. 35.*  
*n. 166.*Der Darmwurm, *Mulleri transl. Linnei syst. nat. .*  
*vol. vi. p. 36.*Der Hurzwurm, *Zwingeri observat. p. 437.*Der Rundwurm, *Goeze. Naturgesch. p. 78.*Der Spulwurm, *Bloch. Abhandlung von der*  
*Erzeugung, &c. &c.**Essential*



*Essential Character.*

The body round. Length from twelve to fifteen inches. Head furnished with three vesicles, forming in their middle a triangular space.

*Description.*

SIZE. When full grown, from twelve to fifteen inches in length ; and in circumference equal to that of a goose quill.

THE HEAD is to be distinguished from the tail by a small contraction, very obvious when the worm is lying down ; it is trilobated, having three vesicles, and a triangular aperture, between which is the mouth. These three globose papillæ are joined together at their basis, and are of the same colour as the rest of the worm.

THE TAIL may be known from the head by its very acute termination, close to which is a large orifice, the extremity of the intestinal canal, which I have therefore termed the anus.

THE BODY is that part between the two extremities, forming nearly the whole of the worm ; it puts on a rugose appearance, and has



has a line very apparent running on each side, and extending from one end to the other. Between these two lines are two other lines running parallel with the former, scarcely visible. Near the middle of the body (rather towards the head) is a circular depression of about the one-fourth of an inch in extent, in which is a very small punctiform aperture. This depressed band is regular in its appearance, when the body of the worm is distended, although it would appear to be wanting when collapsed, in which state it mostly escapes from the intestines.

#### *Situation.*

They generally infest the small intestines, and of these more frequently the course of the jejunum and ileum. Sometimes they are known to ascend through the duodenum into the stomach, and I have frequently seen them creep out at the mouth and nostrils. It happens but rarely, that they descend into the tract of the large intestines, and then only after the exhibition of vermifuges, or from other causes, which increase the peristaltic motion. They have also been detected *post mortem* in the ductus communis cholidochus; and

and instances are related where they have remained a considerable time in the vesica fellis\*.

*Number.*

In general they are very numerous ; I knew a girl eight years old who voided *per anum* upwards of two hundred in the course of a week ; between thirty and fifty is a very common number. Nevertheless instances frequently occur of their being solitary.

*Colour.*

When recently excluded they are transparent, and appear as if they had been sucking water tinged with blood ; this colour, however, soon disappears, and they become at length of a light and opaque yellow.

*Motion.*

When voided by patients they are, in general, very feeble, and soon die in spite of all attempts to keep them alive. I have, however, occasionally succeeded by suddenly evacuating them by a very drastic purge, and

\* There is a preparation illustrative of this fact in the Museum of Mr. Heaviside. The greatest part of the worm is convoluted within the gall-bladder, and a portion of the tail fills the *ductus cysticus*.



immediately putting them into warm milk and water, when they appear extremely vivacious. Their motion is serpentine, and in no respect resembles that of the *lumbricus terrestris*, or earth worm, which has the power of considerably diminishing its length and again extending itself. Whereas that of the *lumbricoid ascaris* is never diminished, the head is always sent forward by the worm curling itself into circles, and suddenly extending it with considerable force to some distance.

### *Sex.*

It is said that the *ascaris lumbricoides* is not hermaphrodite, but that the male and female are distinct worms \*. The worm which I have described is considered as the female, and all the observations I have given are made from one of that sex. Nevertheless, I must observe, that I have examined a very considerable number of these animals, and have never seen any other appearances than those I have described.

\* This is the opinion of many ingenious anatomists, and Dr. Baillie, in his *Morbid Anatomy*, page 122, says, "in the *lumbricus teres* the parts of generation are different in the male and female."



*Anatomical Observations.*

**CUTICLE.** The covering or external membrane of the worm which may be considered as the cuticle, is very strong, elastic, thin, smooth, and transparent; and easily separates from the parts beneath if the worm be macerated a few days after death in water.

**CUTIS.** Under the cuticle lies the cutis, or true skin, which is considerably thicker than the former, and retains the marks of the muscles which it covers. It is also very strong, elastic, and transparent.

**MUSCLES.** When the cutis is removed the muscles, observable through the skin of the worm, present themselves. They do not entirely surround the worm, as from their appearance one would be induced to believe; but are, in fact, two distinct orders acting in opposition to each other; for the two longitudinal lines, which extend from one extremity of the worm to the other, are, each of them, composed of two distinct tendons, separable from one another. These tendons serve for the attachment of the semilunar muscles, which cover the worm from the head to the tail.

**MUCOUS VESICLES.** Upon removing carefully the semilunar muscles from the head to the depressed band, a number of minute vesicles are to be seen (by means of a glass) filled with a submucous fluid, which issues out upon puncturing them. This cellular, or parenchymatous apparatus, closely embraces the intestinal tube, from the head to the depressed band; but from thence to the tail, there is merely a fibrous connecting substance, similar to what is generally called cellular membrane.

**PERITONEUM.** When the muscles are removed from the depressed band to the tail of the worm, an extremely delicate membrane presents itself, analogous to the peritoneum, for it embraces the abdominal viscera, and lines the cavity of the abdomen.

**CAVITY OF THE ABDOMEN.** This extends from the depressed band near the middle of the worm to the tail; it is mostly distended with a transparent fluid, and contains the intestinal tube and an apparatus supposed to be subservient to generation, which constitute the abdominal viscera.

**INTESTINAL CANAL.** This begins at the obtuse extremity or head, from the external  
4 triangular



triangular mouth situated between the three globose papillæ, and is continued for a small space downwards (nearly half an inch) in a parallel form. To this part Dr. Baillie, in his Morbid Anatomy, has given the name of œsophagus. It then becomes larger and transparent, continues increasing in size as it advances, until it arrives at the beginning of the abdomen, in which course it is closely embraced by a parenchymatous substance, as I have before noticed. Having now attained the size of a crow quill, it passes in a straight direction (and gradually enlarges as it advances), through the whole length of the worm, to within the eighth part of an inch, where it becomes suddenly narrower, and terminates in the anus.

This canal is generally filled with a greenish coloured fluid of the consistence of mucus, not very unlike to the *meconium* of infants. If a portion of this tube be macerated for a few days in water, it exhibits distinct tunics, the external of which is a production of the peritoneum; it is externally covered with filaments, which connect it to the abdominal parietes. May not these be vessels of nutrition?

THE SECOND VISCUS. This apparatus is considered by some as peculiar only to the female worm \*, but all agree, that it is for the purpose of generation. It begins near the middle of the worm, where the cavity of the abdomen commences, by a slender tube, which is continued from the punctiform aperture, situated in the depressed band between the two longitudinal lines. This tube, which is termed the vagina, soon becomes much larger, when it commences uterus, and divaricates into two large crura, which, for the space of four or five inches, are continued of an uniform diameter; they, then, on a sudden, become much diminished in size, and appear like opaque threads, embracing in every direction the intestinal tube. These are by *Werner* considered as the Fallopian tubes.

This convoluted apparatus is composed of very fine transparent membranes. It is never found empty, but is always distended with an

\* In fœminis incipit tubo infundibuliformi, qui postice divaricatur in duo ampla crura, &c. &c. In maribus canalis generationi inserviens, præeunte *Tyson*, quem *Murray* et *Werner* secuti sunt, hanc servat rationem: a postico extremo lumbrici incipit canalis conicus aliquot lineas longus, quem *Tyson* penem appellavit. Vide *Schroeteri* Diss. Inaug. p. 13.



opaque fluid, in which are a number of globular bodies, or ovula, containing young worms.

*Refutation of this Worm being viviparous.*

In the second volume of the Memoirs of the Society, to which I have the honour to present these observations, there is an account of the lumbricoid ascaris, accompanied with a drawing illustrative of the worm in the act of voiding her young; the author of which endeavours to prove, that they are viviparous\*.

The

\* "Every one," says Mr. Church, "who has examined  
 " this worm attentively, when newly discharged from the  
 " body, must have observed an appearance of white threads,  
 " folded, as it were together, about the middle of the  
 " worm; this substance has been generally supposed to be  
 " the intestines of the worm filled with the chyle it had  
 " just sucked from the body out of which it proceeded; but  
 " the fact I am going to relate seems to prove, beyond a  
 " doubt, that this white appearance is, in reality, the  
 " young worms nearly fit for exclusion from their parent."  
 And in another part he continues, "I put them (the lum-  
 " bricoid ascarides) into a phial filled with one third part of  
 " rectified spirit and two-thirds water. This appeared to  
 " give them great uneasiness, and whilst I was observing  
 " their contorsions, I perceived something like threads  
 " proceeding gradually from the middle of the belly of one  
 " of them, which advanced very sensibly for about a quar-

The account Mr. Church has given, appears to have arisen, from his not having attended to the internal structure of the animal, for the thread-like appearances, which he has taken to be *in reality the young worms*, are no more than portions of the gyrated apparatus, or Fallopian tubes, I have already described; which always protrude, when the skin of the worm is broken, and this generally happens after any increased peristaltic motion of the intestines. But the most convincing proof of these animals being oviparous is, the detection of ovula in the mucus surrounding them in the intestines, which do not differ, in any respect, from those in the uterus of the worm.

*Refutation of this Worm being (as is by many supposed) the Earth or Lob-worm, Lumbricus terrestris Linnæi.*

The long round worm of the human intestines has, for many centuries, been considered

“ ter of a minute; at which time I could perceive three  
 “ distinct worms, above an inch long, exactly like the pa-  
 “ rent, all alive and moving briskly in different directions,  
 “ About this time the death of the mother put a stop to the  
 “ perfect exclusion of the offspring, who also died with her,  
 “ and now remain hanging to the body.”



of the same species as the earth or lob-worm; the fallacy of which I have therefore thought proper to demonstrate.

The *lumbricus terrestris* has but *one vesicle* at its head, in the middle of which is its mouth; it is flat towards the tail, and is furnished with sharp bristles on its under surface, that serve it for feet, which the animal can erect or depress at pleasure; its annular muscles are very large and strongly marked, and its colour is of a dusky red. Whereas the lumbricoid ascaris has none of these *phænomena*. I have before noticed its colour is a pale yellow, that its muscles are very delicate, and its head furnished with *three vesicles*. Upon the under surface of the earth-worm there is a large semilunar fold in the skin, into which the animal can draw its head, or thrust it out at will; but there is no such form in the ascaris lumbricoides: the former also has an elevated belt in its middle, but in the latter there is a depressed band. On each side of the ascaris lumbricoides there is a longitudinal line very distinctly marked; on the earth-worm there are three lines upon its upper surface.

*Species 2.*

## ASCARIS VERMICULARIS.

*English.* The Maw or Thread-worm.*Latin.* Ascaris.*French.* L'Ascaride.*German.* Der Afterwurm.

## SYNONYMS.

*Asnagides of the Greeks.**Ascaris pollicaris. Linnæi Faun. Suec. n. 1269.*—— *vermicularis. ——— Syst. natur. p. 1076.*—— *cauda sedacea. Mulleri hist. verm. n. 165.*—— *græcorum. Pallas dissert. de infr. vivent.*  
*p. 12.**Vermis ascaris. Le Clerc histor. lumb. lat. fig. 3. p. 10.**Die Aftermade. Mulleri Syst. de Lin. vol. vi. p. 53.**Die Afterwurm. Bloch's Abhandlung von der Cr-*  
*zeugung der Eingeweidewur-*  
*mer. p. 81.**Die Pfriemanschnanz. Goeze Naturgeschichte der*  
*Eingeweidewurmer. p. 97.**Essential Character.*Head obtuse, and furnished with three ve-  
sicles. Tail terminates in a sharp point.*Description.*



*Description.*

**SIZE.** When full grown about half an inch in length, and in thickness resembling a fine piece of thread.

**THE HEAD**, or obtuse extremity, is nodose, and divided into three vesicles or papillæ, in whose middle is an aperture, through which the worm takes its nourishment.

**THE BODY** forms about a third part of the length of the animal, beginning immediately from the head, and terminating in the tail, known by its becoming less. It is of a rugose, pellucid, annular fabric.

**THE TAIL** commences where the body ends, gradually becoming less, and terminating (like a cobbler's awl \*) in a fine point. When viewed with a glass, it appears subulated, and furnished with rugæ or thick firm annuli, and there is a small aperture at its beginning, through which the fæces are excreted.

*Situation.*

They are most commonly situated in the intestinum rectum of children, and are con-

\* Thus it is called by some German writers *Die Schwanzspike*,

tinually passing *per anum*; hence they are called by the Germans *Afterwurm*. They are frequently met with in the *cæcum* and colon, and have been found in the stomach \* and small intestines, lying hid between their tunics.

They not unfrequently creep round from the *anus* to the vulva in women †, and I have known them inhabit the vagina and uterus. Anatomical investigations after death have exposed them in the bladder and urinary passages.

### *Number.*

This species is generally in very considerable numbers, especially in the rectum of children. When they inhabit other parts, their numbers are less considerable, yet I have known upwards of an hundred vomited in the

\* Wolf Observat. Chirurg. Medic. l. 2. obs. 4.

† Hippocrates, in his liber de morbis mulierum, affirms, that the ascarides are generated in *sinu pudendi muliebris*, and recommends the semen viticis and ox's gall to destroy them. His words are, Επὴν γυναικος ἐν τῷ αἰδοίῳ ἢ ἐν τῷ ἄρχῳ ἀσκαρίδες γίνωνται, λύγῃ καρπὸς μίσγειται, ἢ φύλλα, καὶ ῥοὸς χολὴ παραμίσγεται ὅσον ὀβολός, κεδρινῷ δὲ ἐλαίῳ φυρῆν, καὶ εἰρίῳ πινέοντι ευιρωτάτῳ ἀναλαβεῖν.



course of a day from the stomach of a young woman.

*Colour.*

Their natural colour is a pale yellow. They are often observed of a yellowish green, and occasionally brown. This would appear to depend upon a variety of circumstances with which we are unacquainted; for, if suffered to remain a day or two in water, they always (whatever their colour may be) become of an opaque pale yellow.

*Motion.*

The head is the part first put into motion, which the animal turns in every direction, sometimes forming a circle, at other times the figure eight; but most frequently its tail appears fixed, whilst it turns its body sometimes to one side, and then to the other. They are extremely vivacious, and I have seen them bury themselves in the soft fæces of children almost instantaneously upon exposure to the atmospheric air. By some they are said to jump from one place to another, but I cannot say I have ever seen them\*.

\* This circumstance appears to have given rise to the name ascarides; for *ασκαριζειν* signifies the same as *σκαριζειν* saltare, inquiete movere, salire.

*Sex.*

The vermicular ascarides are not, as is the generally received opinion, hermaphrodite. The male and female are distinct worms.

THE MALE, when exposed to the magnifying power, does not exhibit any of the gy-rated apparatus, which, in the female, is decidedly for the purpose of bringing the young to perfection. The stomach and intestinal canal have, apparently, a different arrangement from those of the female, and are the only viscera I have been able to detect. I have searched for the male organs of generation, but have never been fortunate enough to find them. Perhaps they are so very minute as to elude our researches.

THE FEMALE has, upon its external surface, about the eighth of an inch from the head, a small punctiform aperture through which the young are protruded. When the worm is very much magnified, its internal cavity appears filled with the convoluted apparatus; and I have seen upwards of an hundred of the young escape through the external aperture, all alive, and very vivacious, several hours after the death of the mother, upon making a slight pressure with the finger.

*Anatomical*



*Anatomical Observations.*

The integuments of this species are similar to those of the lumbricoid ascaris, and consist of cuticle, cutis, and, as far as I can discover, only one set of annular muscles.

I have never been able to detect any longitudinal lines upon its external surface.

The cavity in which the viscera are situated, begins at a very small distance from the head, and terminates where the tail commences; at which place there is a small opening, the extremity of the intestinal canal.

The only viscera in the MALE worm are the œsophagus, stomach, and intestine.

The ŒSOPHAGUS begins at the mouth, gradually enlarges for a small space, and terminates in the stomach.

The STOMACH is a somewhat round bag, situated at the extremity of the œsophagus, so that, both together, they are pistilliform, that is, resembling an apothecary's glass pestle, which, according to Goeze, constitutes a distinguishing character of this species\*.

The

\* "Dies ist eine ganz eigene art," says Goeze, "und unterscheidet sich von allen ubrigen standhaft durch folgende unveranderliche karaktere:

1. durch

The stomach evacuates its contents into the INTESTINAL CANAL, which is continued through the worm, more or less contracted or dilated, until it terminates in the anus.

The contents of the stomach and intestinal tube are always of the same colour, a dark brown.

THE FEMALE worm has (besides the viscera I have described) an apparatus subservient to generation. It begins by a slender tube leading from the small punctiform opening or *pu-denda*, situated nearly in the middle of the body of the worm. It soon becomes much larger, embraces the intestinal tube in every direction, and fills up the cavity of the worm. This gyrated uterus is not bifurcated as in the *ascaris lumbricoides*, nor has it those filiform appendages. Its end or fundus is as large as any other part. When viewed with the microscope, it appears like a bladder distended with worms, for its young are distinctly seen moving about from one end to the other.

1. durch den, wie eine Morferteule, gestalteten Saugkanal und Magen.
2. durch den, wie eine pfrieme oder Schusterraale, in die feinste Spike zulaunfenden, Schwanz."



GENUS II.

*Species I.*

TRICHURIS VULGARIS.

*Latin.* Trichuris.

*English.* The long Thread-worm.

*French.* Le ver a queue.

*German.* Der Schwanzwurm.

SYNONYMS.

Trichuris. *Wagleri* & *Roederer de morbo mucoso, &c.*

Trichuris intestinalis. *Wrisberg de animal. infus. p. 6.*

Ascaris Trichuria. *Schroeter, dissert. Inaug. de vermibus. C. H. p. 16.*

Der Schwanzwurm. *Blumenbach, hand. der natur.*  
& *Bloch. Abhand. von der*  
*Erzeug. der Eingeweide-*  
*wurmer.*

*Essential Character.*

Body large and furnished with a proboscis.  
Tail twice as long as the body, and filiform.

*Description.*

SIZE. The body, when full grown, equals  
in breadth the sixteenth of an inch. In  
length

length the whole worm measures nearly two inches, two-thirds of which are tail; hence the French call it *le ver a queue*.

The large extremity of the trichuris is the HEAD, out of which proceeds a kind of proboscis, not always visible; for the animal has the power of ejecting and drawing within itself this instrument at pleasure.

THE BODY may be said to begin at the basis of the proboscis; it is the thickest part of the worm, and the most so at the extremity, where the proboscis is received. It gradually diminishes in size as it proceeds, and forms about one-third part of its length.

The TAIL commences where the body terminates. It is twice as long as the body, and appears like a fine hair, gradually becoming smaller, and at length terminates in a very fine point.

#### *Number.*

I have seen upwards of twenty in some fæces of a child of six years old, and, according to the account of Blumenbach, they are, in general, in considerable number.

#### *Situation.*



*Situation.*

Wrisberg, Blumenbach, and others, have found these worms in the intestinum rectum, in the inferior part of the ileum, and also in the jejunum, mixed with their pulstaceous contents. I have never seen them after death but in the cæcum.

*Colour.*

Like the vermicular ascarides.

*Motion.*

The only worm I have had an opportunity of examining alive, was that from which the drawing annexed was taken. Its motion was by no means vivacious, which would appear to arise from a want of power, as the animal died soon after. About a minute before its death the proboscis was withdrawn, and suddenly elongated three or four times, when it gradually curled itself into the shape in which it is represented, and was never observed to move after.

*Sex.*

Goeze has given a drawing of a female trichuris, and says it has no proboscis (the

proboscis he supposes to be the male organ of generation) ; but, as I have carefully dissected those which were, apparently, without the proboscis, and find no material difference in the viscera, I am inclined, at present, to doubt the fact. If the apparatus contorted in a serpentine manner be peculiar to the female, and be considered as the ovarium, why should it exist in a male worm ?

*Anatomical Observations.*

This curious and singular animal is supplied, like the foregoing genus, with annular muscles, cutis, and cuticle.

The proboscis, which is undoubtedly the head of the worm \*, appears to be formed of a transparent substance, and contains a canal which is continued through the pulpy or funnel-like portion to the stomach and intestine.

THE STOMACH AND INTESTINE are formed by a long canal, which proceeds in a direct line from the head to the very extremity of the worm. It is largest at its beginning,

\* Goeze considers this proboscis as the penis, and says the other extremity is its head ; and in the female drawing he makes the filiform extremity the tail, and the other the head.



and continues of the same size throughout the body of the animal; and when arrived at the place where the tail commences, it suddenly becomes considerably less in diameter, and terminates in the anus.

The remaining viscus, or OVARIUM, is a convoluted canal similar to that of the female vermicular ascaris, but is seldom found embracing the intestinal tube. The contents of this canal are ovula and a limpid fluid. I have never seen any young worms.

## O R D E R II.

## G E N U S I.

*Species 1.*

## TÆNIA OSCULIS MARGINALIBUS.

*English.* The tape or long joint-worm.*Latin.* Tænia cucurbitina, Solium.*French.* Le ver folitaire.*German.* Der Kurbiswurm.

## SYNONYMS.

Vermis cucurbitinus. *Plateri praxis medica. p. 992.*Catena de cucurbin. *Valisneri opera in folio, p. 177.*Vermi cucurbitini. ——— *neuve observazioni.*  
*p. 174.*Lumbricus latus. *Tyson philosoph. trans.*————— *De Haen ratio medend. p. 12. c. 5.*  
*p. 210.*Tænia folium. } *Andry. gener. des vers. cap. 3.*  
——— sans épine. } *art. 2. p. 74.*  
Ver cucurbitaire. }Tænia cucurbitina. *Pallas elench. p. 405.*————— *Vogel de cog. & cur. corp. hum.*  
*affect. p. 146.*Tænia articulos demittens. *Dionis dissert. de tænia.*Tænia secunda. *Le Clerc hist. lumb. lat. tab. i. a. tab. ii.*Tænia folium. *Linnæi syst. natur. edit. 12. p. 1323.*Tænia a longues articulations. } *Bonnet. mem. des sav.*  
Tænia anneux longues. } *etrang. v. p. 1.**Essential*



*Essential Character.*

The oscula are situated upon the margin of each articulation, and the ovaria are disposed in an arborescent form.

*Description.*

This animal consists of an head \* placed at the smallest extremity, and a chain of articulations more or less broad or long, which gradually enlarge as they advance, and at length terminate in a tail, formed by a rounded joint. Each of these joints contain their proper viscera.

EXTERNAL STRUCTURE OF THE HEAD. When viewed by the naked eye, and lying upon a flat surface, three projections present themselves, one anterior, and the other lateral. But if the head be held up, and its extremity viewed attentively, five projections are conspicuous; one situated directly anteriorly and in the middle, and the other four backwards, and laterally.

\* Linnæus strenuously denied that the tænia had any such head, as appears from many parts of his writings.

The anterior projection is the proboscis of the worm. When examined by the aid of glaffes, it presents a protuberant margin, surrounding an excavation of a striated appearance like a star. In the centre of this is an orifice or mouth leading to a canal, hereafter to be mentioned. The stellated appearance, when more minutely examined and enlarged by the magnifying lens, is found to be composed of two series of radii, with little bulbs or vesicles corresponding to the number of fibrils, with which the margin is beset, and which gives it a laciniated appearance. These laciniae\* are by some said to be vaginal, including fucorial bulbs, whence they have named them “*vaginae sugentes.*”

Passing backwards we come to the neck of the proboscis, which, as it advances towards its basis, becomes flattened and broader. Its basis is quadrangular, and has an hollow protruding tubercle or osculum at each angle. It then becomes considerably flattened, and forms a thick margin, which receives the

\* Tyson calls them *spiculi hamati*, and they are the *uncinulae* of Pallas and Loeske.



superior or adjacent margin of the next joint.

THE EXTERNAL STRUCTURE OF THE JOINTS. In this species of *tænia* the joints differ very much in the same worm. Their figure is by no means characteristic. They are, for the most part, oval, rhomboidal, oblong, or quadrangular, and generally have a great resemblance to large cucumber seeds; from which circumstance the detached joints have been named CUCURBITINI. They are shortest near the head, and their length towards the tail is sometimes exceeded by their breadth.

When the surface of a joint is viewed by a microscope, directly after it has been wiped with a sponge, it appears rough and villous, but it soon becomes covered with a white tenaceous liquid, which exudes through the pores of the skin. If this liquid be again wiped off during the life of the animal, it is quickly renewed. May not the villi be exhaling vessels? On the margin of each joint, near the middle, is an osculum, and none on the opposite margin of the same joint. It sometimes happens that a joint is furnished with more than one osculum. They have



frequently been observed with three or four. I have in my possession a joint with five ofcula upon one margin. May not this throw some light upon the propagation of the joints? But, in general, the next joint has its ofculum situated on the margin of the opposite side, so that it alternately changes. This order, however, is seldom preserved throughout the whole tract of the worm, for they are sometimes on the same side for several joints together, but they never are situated on the flattened surface; hence their being marginal is an essential character of this species.

*Anatomical Observations.*

I have never been able to detect but one membrane in the tænia, which is very porous and elastic, and which I am induced to believe, from some experiments, is endowed with nervous power. Tæniæ, therefore, have no cuticle.

**THE HEAD.** The head is composed, like the other parts of the worm, of cutis and muscular fibres. The fibres, however, are not in any regular order, but appear to run in every direction, and are united together



gether by a connecting cellular membrane.

The head contains also within it the beginning of the alimentary canal, which originates from the mouth by a simple tube or œsophagus, that bifurcates near the basis of the proboscis. This bifurcated alimentary tube proceeds from the head near each margin of the worm to the other extremity.

Through this canal the animal conveys the chyle to every part for its growth and increase.

INTERNAL STRUCTURE OF THE JOINTS. When the cutis is removed the muscles of the worm are laid bare. They are of a white colour, very much resemble the coagulable lymph, and are disposed into two orders, evident to the naked eye.

1. *The longitudinal* or external muscles, which are of a strong, firm texture, running parallel to each other in the direction of the worm, being firmly attached to a kind of ligamentous band, and placed along the articulatory receiving margin of each joint.

2. *The transverse* muscles, which are situated under the longitudinal, and across the joint transversely from one extremity to the other.

other. I have never detected any point of adhesion at the margins, and believe them to be annular.

When the *longitudinal* muscles contract the length of the joint is diminished and drawn forward.

The *transverse* muscles act by diminishing the breadth of the joint, and sometimes render it almost round.

Each articulation, or joint, is furnished internally with two distinct kinds of vessels, the alimentary tube and the ovaria.

The rest of the joint is composed of a connecting cellular substance.

ALIMENTARY TUBE \*. I have already described the beginning of this canal in the structure of the head, at the basis of which it divaricates into two distinct canals, which are continued near the margins from one extremity to the other, and in the extreme joint, where it is impervious. This longitudinal tube is also supplied with transverse canals. There is always one sent across each joint along the articulatory receiving margin to the canal on the opposite side, with which

\* Le Clerc was the first who discovered this canal, but he had not the most distant idea of its use.



it has a communication, so that the contents of one tube are, with great facility, communicated across to the other. As these canals are not to be detected except by injecting the worm, it may not be unacceptable to my readers to relate the method I usually pursue. Having prepared my injection \*, and soaked the injecting syringe, and the portion of the worm, for some time, in warm water, I make a longitudinal incision with a lancet, near the margin of the joint, and introduce the point of the syringe filled with injection, taking care that its head is turned towards the head of the worm, and then make a gentle pressure on the syringe, when the injection will soon be observed running along the sides of the worm, and several yards may be injected by one push. When the worm is thus injected, it should be carefully dried and

\* The injection for this purpose is prepared in the following manner. Take of fine parchment shavings one handful, and boil them in three pints of soft water to a pint and a half; and then strain it through a very fine gauze sieve for use. Of this size I generally take a small cupful, and mix as much finely levigated Chinese vermillion, or any other colouring matter, as is sufficient to give it the desired shade. The syringe I usually employ is, an oyster syringe with a quicksilver tube.



put into oil of turpentine, when the longitudinal and transverse canals will appear very distinctly.

OVARIA. Each individual joint has a vascular structure situated between the longitudinal canals, occupying the middle of the worm. It is always disposed in an arborescent form, and is termed the *arborescent ovaria*, from its resemblance to a tree, being composed of a middle canal or trunk, and lateral ramuli. There is a communication between this arrangement of vessels and the osculum on the margin, by means of an intermediate canal, which, in some joints, is filled with a brown matter. The ovaria are generally filled with an opaque fluid, very like chyle, which is said to contain ovula. In some joints, and mostly those near the tail of the worm (for these are generally more transparent than the rest), this circumstance is evident to the naked eye, especially if the joint be put on blue or black paper.

If some of this opaque chyle-like fluid be taken out of these canals and exposed to view in a good microscope, it is said to exhibit ovula of different sizes, from the largest of which very slender tæniæ have been seen to escape



escape upon rupturing its ovum, contorted in a spiral form, and having conspicuous traces of articulations, and one extremity acuminate, the other obtusely broad \*.

*Of the Connexion of the Joints.*

The joint next to the head is received into the basis of the head, and it, in like manner, receives the beginning of the next joint, which order is observed throughout the whole extent of the worm. Thus the inferior margin of joint, or that towards the tail, is called the receiving articulatory margin, to distinguish it from the other which is received. The receiving articulatory margin is supplied with a ligamentous band, to which the longitudinal muscles are attached, which firmly embraces the next joint. This margin may always be known from the other by its being largest, and by its being fringed, whereas the other is plain, and somewhat rounded.

*Of the Separation of the Joints of this Worm into the VERMES CUCURBITINI.*

The joints of the *tænia osculis marginalibus* are very easily separated from each other

\* Vide Goeze.

whilst the animal is alive. This separation is effected either by the peristaltic motion of the intestines, or, perhaps, spontaneously. Each joint thus detached from the mother worm, has the power of retaining, for a considerable time, its living principle, and is called, from its resemblance to the seed of the gourd, *vermis cucurbitinus*. This phenomenon has given rise to many warm disputes; several authors have denied their being portions of *tæniæ*, and have affirmed that they were distinct worms; but of this hereafter. The separated joints do not appear capable of retaining their situation for any length of time, but are soon forced down the intestinal tube, and at length creep out, or are expelled *per anum*. I knew a man who had been for some time troubled with this species of *tænia*; whenever he took an ecoprotic medicine, he voided upwards of forty detached joints with his *fæces*; and, I remember a female patient, who was always tormented by their creeping *per anum* two or three hours after dining, without the exhibition of any medicine. Such eliminations are common to all who nourish this worm.

Thus



Thus it is evident that the joints of this animal exist for a time when separated from each other. I have kept them alive, and fed them for two or three days together; but I do not believe that they are capable of living any length of time in the intestines, when perfectly detached.

I am inclined to believe that the vermes cucurbitini have not the power of propagating the species, i. e. of forming fresh joints; I conceive that property to be peculiar to the head; but this is to be considered as mere hypothesis, cherished by the two following circumstances: 1st. That their expulsion always succeeds their being detached; and, secondly, that the separation of the joints appear to be the only means of insuring the worm a continuance in its sphere; for, were the head to continue multiplying the joints, and the joints have the same power, they would soon obliterate the cavity of the intestinal tube, and, consequently, effect their own expulsion.

### *Of the Formation of fresh Joints.*

There are several cases faithfully recorded, and several have come under my own care, where

where the persons, if their veracity can be depended upon (and they had no interest in deceiving), have voided, during the time they were troubled with the worm, upwards of fifteen thousand. I have attended several patients who were martyrs to the ravages of this animal for upwards of seven years, and the number of joints which during that period have been evacuated, are beyond all conception; from some, upwards of fifty per day, and seldom fewer than twenty.

When a specific is administered, and the *whole* worm or worms is brought away by stool, no more portions are ever known to follow. But experience teaches, that when all is voided except the head, that then in a short time after, fresh joints are generated, and the patient is as much troubled with them as before.

Thus it is evident that the formation of the joints is proper to the head of the animal, and, I believe, to it alone.

*Number of this Species of Tænia.*

It is not, in general, solitary, as is commonly supposed; Herrenschwanz, Madam Noufer,



Noufer, and others, mention their seeing several come away, at the same time, from their patients.

### *Situation.*

They are always found in the *jejunum* and *ileum*, occupying their whole extent.

### *Colour.*

Tæniæ are mostly of a pale white, but the colour varies in different worms. They are not unfrequently of a light brown cast, which, in all probability, arises from living on the chyme, or on chyle mixed with some bile.

### *Motion.*

The motion of tæniæ is undulatory. The first joint towards the head contracts, the succeeding ones follow successively, and the worm is at length drawn considerably forwards, exactly in the manner that the earth worm is seen to move, but not near so rapidly. By this means the food taken in at the mouth of the worm is very soon conveyed all along the alimentary canal. I have detected milk mixed with a colouring matter

running along this canal in the above manner with considerable rapidity.

### *Sex.*

There can be very little doubt of *tænia* being hermaphrodite. The oscula are believed to be viscera, subservient to the propagation of the species\*, and they can be proved to give exit to the ovula.

### *Length.*

Boerhaave mentions his meeting with a *tænia* thirty ells in length, and Pliny says he has seen them upwards of thirty feet long. The exact length, however, depends upon the manner in which the death of the animal was occasioned. If expelled by irritating

\* This is the opinion of the ingenious Mr. Carlisle, who says, "In a *tænia* which I obtained before it was dead, I observed, at one part where it had formed a knot upon itself, that two pairs of these oscula were in contact with each other, and were agglutinated together by a viscid mucus. I was not at that time aware of the possible nature of this connexion, and neglected preserving them in that state. I now suspect, however, that they were in the act of copulation, and that a mutual influence takes place previously to the formation of ova. Vide Transactions of the Linnean Society, vol. ii. p. 255.



medicines, it will not be as long by nearly one-half, as if its death had been occasioned by emollients; for, in the first instance, it would be very much contracted, but in the latter, very much relaxed.

## OBSERVATIONS.

Dionis, in his treatise upon *tænia* \*, has called this species *tænia articulos demittens*, in consequence of the frequency of its parting with its joints; and this circumstance has given rise to innumerable errors.

The Arabian physicians observing these detached portions come away alive, and not thinking it possible they could be joints of another worm, believed they were a distinct species, and described them accordingly.

Others, finding several of the joints articulated together, believed it to be in consequence of suction †.

Those who could not conceive how the angles and vessels could correspond so exactly, supposed they were all surrounded by a common membrane, which Van Helmont

\* Dissertation sur le *Tænia* ou ver plat. p. 14.

† Vide *Larthusser fundam. path.* tom. ii. p. 203.

affures us has its origin from the intestinal mucus.

Linnæus arranges them amongst the polypi, and many very learned authorities appear to favour his opinion. The following is an extract from one of his letters to Baron de Haller. *Tæniam examinavi, et reperi 14 vivas integras, quæfivi caput quod omnes medici in lumbrico lato, quæfiverunt, sed frustra; fal-  
sissimum est caput, quod Tulpius habet in observationibus, et frustra quæritur caput, nam caput est in singulo articulo, et os in singulo articulo, in una specie subtus, in altera ad la-  
tus. Nullus mortalium potuerit intelligere hunc vermem, qui non intellixerit polypo-  
rum naturam, et propagatur secedentibus ar-  
ticulis, dum quilibet articulus vivit et accrescit  
in perfectum corpus: inferui actis Upsaliensibus  
nunc imprimendis \*.*

Some believe the lateral oscula to be the mouths by which they take in their food, and, at the same time, consider them as excretory vessels. Coulet † and Ernst are of this opi-  
nion; the latter expresses himself thus: *Nihil*

\* Vide Linnæus in Collect. Epistol. ab erud. viris ad Haller. Tom. 2. p. 411.

† Tractatus Hist. de Ascarid. l. c.



ergo restat quam statuere idem orificium absorptioni chyli et excretioni excrementorum inservire. Objectio enim quasi nulla excrementa ejicerent isti lumbrici, quia merum chylum ederent, nulla est; alias infantes puro lacte viventes nihil excrementitii haberent; nec absurdum putes hoc ben. lect. si idem osculum et deglutitioni et excrementis largior. Stella enim marina unicum in superiori superficie habet orificium quo artificiose prædam arripit, devorat, et quicquid est excrementitii, per idem orificium reddit, nonne idem nostræ Tæniæ natura diversimodo ludente privilegium concedi potuit\*?

Bonnett appears in one part of his treatise on insects, to favour a similar opinion, although he expresses himself very differently in other places. Speaking of a species of tænia he observed with two oscula on the flattened surface, he says, “ Ces petits viscères analogues à l'estomac et eux intestines communiquent avec les stigmates; et si le plus grand de ces stigmates fait le fonction de bouche, on presume assez que l'autre s'acquitte de l'anus †.”

\* Vide Ernst. Dissert. Inaug. de Tænia secunda Plateri.

† Vide Bonnett Traité d'Insectologie.



The same author considers them as organs of respiration \*. The arboreſcent ovaria are, by thoſe who believe the oſcula to be the true mouths which convey nourishment to the worm, taken for chylopoëtic veſſels, and their ovula for ſmall glands † or pieces of fat, or young polypi ‡.

The four fuckers at the head, Andry affures us, are their eyes § ; and Mery is willing we ſhould conſider them as the animal's noſtrils ||. The obtuſe extremity has been taken for the head, and the true head for the tail \*\*.

It is ſomewhat ſingular that ſo many accurate obſervers in ſeveral nations have, during many centuries, pretended that there never was but one of theſe tæniæ in the ſame individual, from whence aroſe the name of SOLIUM, and by the French *Le ver ſolitaire*.

It appears to me ſuperfluous to prove the

\* Vide Bonnett, l. c.

† Vide Syſtem. Natur. Linnæi, tom. i. p. 1323.

‡ Vide tom. iv. des Memoires des Curieux de la Nature a Berlin, p. 218.

§ Andry ſur la Génération des ver. loc. cit.

|| The ſame book.

\*\* Le Clerc Hiſtor. Lumbric. lator. p. 165.



fallacy of these and various other ridiculous opinions, and to refute them; for having, I trust, satisfactorily demonstrated, that they have heads, and the head an apparatus by means of which it absorbs the nourishment, which passes from thence to every articulation of the worm; that the oscula, and the various ramifications which are observed in the internal part of the joints, are subservient to generation, and that ovula pass from thence into the intestinal canal; and as it is sufficiently proved that these *tæniæ*, as well as other worms of our intestines, exist only in the human body, and that in society, I think all further refutation needless.

*Species 2.*

TÆNIA OSCULIS SUPERFICIALIBUS.

*English.* The broad tape worm.

*German.* Der Breite Bandewurm.

*Latin.* *Tænia lata.*

*French.* Le *tænia* large de l'homme.

SYNONYMS.

*Tænia prima.* *Plateri prax. medic. c. 14.*

*Lumbricus latus* seu *Tænia intestinorum.* *Plateri edit. ult. tom. iii. p. 816.*

Tænia. } *Andry generation des vers. c. 3.*  
 Solium a epine. } *art. 2. p. 73.*

Tænia articulos non demittens. *Dionis dissert. de tænia.*

Tænia prima Plateri. *Le Clerc hist. lumb. lat. tab. 5.*  
*fig. 1. tab. 6. fig. 2. tab. 7.*  
*fig. 1. ♂ tab. 8. fig. 1. 2. ♂ 4.*

Tænia lata. { *Linnæi System. natur. edit. 12. p. 1323-4.*  
*Pallas Elench. Zooph. p. 450.*  
*Dissert. de inf. viv. p. 35.*

Tænia osculis lateralibus solitariis. *Linnæi Syst. natur. edit. prim. n. 3. p. 324.*

————— geminis. *Linnæi Amæn. Acad. t. 2. p. 78. tab. i. fig. 2.*

Tænia vulgaris. *Linnæi System. natur. edit. ult.*

Tænia a anneaux courts. } *Bonnett Memoires des*  
 ——— articulations courts. } *Scavant. Etranger.*  
*vol. i. p. 478.*

Tænia acephala. } *Vogel de cog. ♂ cur. corp. hum.*

Tænia capitata. } *affect. 1772. p. 645-6.*

Der Breite Bandewurm. *Mulleri System. Linnæi, vol. vi. p. 707.*

### *Essential Character.*

The oscula situated on the flattened surface of each joint. Ovaria disposed like a star round the osculum.

### *Description.*

It is composed of a head, a chain of articulations, and a tail formed of a round joint.



THE HEAD is similar to that of the other species.

THE JOINTS are more uniform in their appearance than those of the *tænia osculis marginalibus*. They are considerably more broad than long, and their oscula are not placed on the margin, but in the middle of the flattened surface, and only on one side. I have never seen them change their side, but have always observed them on the same side throughout the whole extent of the worm.

In every other respect the description of this species agrees with that which I have given of the other, except that the ovaria are in the form of a rose or star, hence they are called by some writers *Ovaria rosacea*, and others *Stigmates rosacées*; and that the transverse canals by which there is in the other species a communication between the longitudinal canals, are in this wanting.

#### *Separation of the Joints.*

In regard to the separation of the joints, it is to be remembered, that this species seldom or ever parts with any; and when it does, it happens from some increased peristaltic motion

tion of the intestines (and not spontaneously) by which a portion is torn asunder, and passes off with the fæces : thus Dionis has called it *Tænia articulos non demittens*. This, however, is no characteristic of its species, for when the worm is come away, how are we to know whether it ever sent off any joints ?

*Number of this Species of Worm.*

Uncertain. Seldom more than three or four ; but this number is by no means unfrequent.

*Length.*

This species of *tænia* seldom exceeds five yards in length.

*Situation.*

It is always situated in the small intestines, and it would appear that it feeds on no other food than pure chyle.

*Colour.*

It is for the most part of a darker hue than the former species, nevertheless I have seen it as white as milk.

*Motion*



*Motion and Sex.*

Like those of the other species.

## OBSERVATIONS.

This species of *tænia* is very seldom met with in this country, but is endemic in Switzerland and Russia \*, and very common in Germany and other parts of Europe.

It is no uncommon circumstance in the countries where this species is endemial, to have it come away before it has arrived at its full growth, and this occurring so frequently, has given rise to the name of *TÆNIA TENELLA*, which is by many considered as a distinct species, though, in reality, no other than the worm we have just described, differing from it in size only, having every thing else in common with it.

Linnaeus enumerates another species of *tænia*, which he says has two oscula on each joint, one placed upon each side, and which he terms *TÆNIA VULGARIS*. This, which at most can only be a variety, is called by

\* Vide Cartheuser libellus de morbis endemiis.

Pallas LE GRIS, who says it is of a white colour, and that easily changed into a griseous one by spirit of wine. As I have never had an opportunity of observing this worm, I pass it by—probably it is only met with in Switzerland.

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## EXPLANATION OF THE PLATES.

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### ASCARIS LUMBRICOIDES.

Fig. 1, represents the worm as it appears when recently voided from the bowels.

- a.* The head.
- b.* The tail.
- c.* The depressed band.
- d.* The punctiform aperture.
- e.* The line extending from the head to the tail.
- f.* The gyrated apparatus as it appears through the skin of the worm.

Fig. 2, represents the viscera of the worm in their natural situation; the sides of the skin being fixed down by pin-heads.

*a.* The



- a.* The head.
- b.* The œsophagus.
- c.* The intestinal canal.
- d.* The lines of the body of the worm.
- e.* The uterus and its convoluted appendices.

Fig. 3, represents the uterus, its bifurcation, and its appendices, as they appear when unravelled.

Fig. 4, represents a portion of the worm, as it sometimes escapes from the bowels : part of the convoluted apparatus protruding through the parietes of the abdomen.

Fig. 5, represents the head enlarged by the microscope, in which the three vesicles, and the triangular mouth, are seen very distinctly.

Fig. 6, represents the anus and termination of the perpendicular line.

## ASCARIS VERMICULARIS.

Fig. 1, exhibits the worm in its natural size.

Fig. 2, represents a very frequent appearance of this worm when viewed by the microscope.

- a.* The head.
- b.* The tail.
- c.* The pistilliform stomach.
- d.* A convoluted

- d.* A convoluted apparatus that surrounds the intestinal canal, which is here and there very obvious.
- e.* Most probably the anus.
- f.* The external part of the organs of generation.

Fig. 3, exhibits another appearance of the vermicular ascaris, when enlarged by the microscope.

- a.* A bladder-like appearance about the head.
- b.* The external part of the organs of generation through which an immense number of ova and young worms have been observed to escape.

### TRICHURIS VULGARIS.

Fig. 1 and 2, represent the natural size of this worm, which is sometimes convoluted and sometimes straight.

Fig. 3, exhibits the worm as it appeared through the microscope.

- |                                   |                     |
|-----------------------------------|---------------------|
| <i>a a.</i> The head.             | <i>b.</i> The tail. |
| <i>c.</i> The proboscis.          | ∖ A hollow tube.    |
| <i>d d.</i> The intestinal canal. | × The ovaria.       |

### TÆNIA OSCULIS MARGINALIBUS.

Fig. 1, a portion of the worm of its natural size and usual appearance.

- a a.* The marginal oscula.

Fig.



Fig. 2, a portion of the worm injected, to shew the intestinal canal.

Fig. 3, exhibits the arborescent ovaria, as they appear between the intestinal canal, when injected with their natural fluid or quicksilver.

Fig. 4, the head of its natural size.

Fig. 5, the head enlarged by the microscope.

Fig. 6, a full view of the head, as it appears when very much magnified.

- a.* The oscula at the basis.
- b.* The protuberant margin, and stellated appearance.
- c.* The mouth.

Fig. 7, a detached joint of the usual size.

- a.* The extremity which is received.
- b.* The extremity which is supplied with the ligamentous band to receive the next joint.

Fig. 8, exhibits a full view of an osculum, from which a dark line is seen running inwards; this is sometimes a frequent occurrence, and is often observed in many joints, as in fig. 9; it is a canal, distended with a dark pulpy substance, but has no communication, that can be detected, with the intestinal canal or ovaria.

## TÆNIA OSCULIS SUPERFICIALIBUS.

Fig. 1, exhibits the largest and most extreme portion of this worm with its superficial oscula. The head is similar to that of the tænia osculis marginalibus, with this difference only, that it is much more filiform.

Fig. 2, represents a portion of the worm with the intestinal canal and ovaria as they appear when injected.

*N. B.* The tail is here delineated as terminating in a rounded joint, which is the most common mode of termination; nevertheless, it is sometimes seen terminating by a bifurcated apparatus, and each fork has been observed, since these drawings were engraved, to have four or five tentacula.

THE END.













