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angulated at the apices, which do not pass the broad basal segment of the abdomen. Anterior femora armed beneath with two strong spines, one near base and one near apex.

Long. excl. tegm., ♂ 36 millim., exp. tegm. 115 millim.

Hab. Andaman Islands, Port Blair (*Meldola*).

LXI.—*Studies on the Enchytræidæ.*

By Dr. W. MICHAELSEN *.

[Plate XVIII.]

AS regards the systematic arrangement of the family Enchytræidæ we have before us two different modes of treatment:—

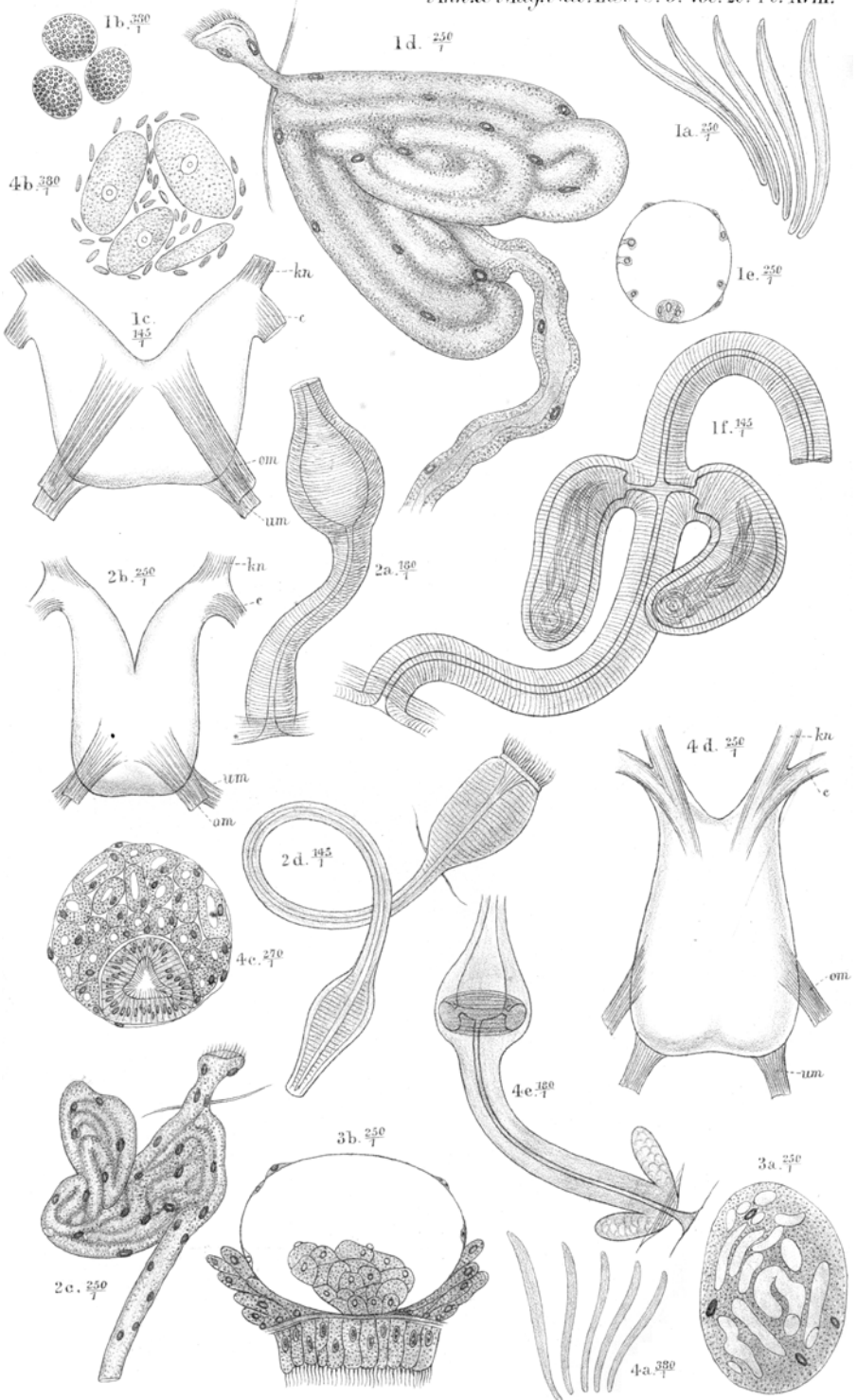
1. Claparède's old division into the genera *Enchytræus*, Henle, and *Pachydrilus*, Clap.†, to which the genera *Anachæta*, Vejdovsky, *Distichopus*, Leidy, and *Buchholzia*, aut., were subsequently added; and 2. The newer classification by Eisen into the three genera *Mesenchytræus*, *Archienchytræus*, and *Neoenchytræus* ‡.

Eisen founds his classification in the first place upon the form of the cerebrum, having previously amalgamated the genera *Enchytræus* and *Pachydrilus*. In justification of this amalgamation he says:—"It is evident, as Ratzel and others have shown, that the colour of the blood is hardly a character of sufficient value to permit us to found on it the distinction of genera;" and he adds, "It may also be remembered that one of Claparède's species, *Pachydrilus lacteus*, has white blood, and that not all red-blooded live in water." The conclusion deduced from this statement would be justified if the colour of the blood and residence in water were actually the only points in which the *Pachydrili* differ from the other Enchytræidæ. But this is not the case. There are other essential characters by which the red-blooded Enchytræidæ are characterized as a perfectly natural group which may

* Translated by W. S. Dallas, F.L.S., from a separate copy, forwarded by the Author, of his paper entitled "Enchytræiden-Studien," published in the 'Archiv für mikroskopische Anatomie,' Band xxx. pp. 366-378 (1887). The numbers attached to the Author's notes have been retained in parentheses in all cases where the titles of works or memoirs are given. This will facilitate reference throughout the paper.

† (1) Claparède, 'Rech. Anat. sur les Annélides, Turbellariés, Opalines et Grégarines' (Geneva, 1861).

‡ (2) Eisen, "On the Oligochaeta collected during the Swedish Expeditions to the Arctic Regions, in the years 1870, 1875, and 1876," in Kongl. Svensk. Vet.-Akad. Handl. Bd. xv. 1877 (Stockholm, 1877-79).



claim generic rank. They have S-shaped setæ and are destitute of the salivary glands. As the first thing, therefore, I show that the genus *Pachydrilus*, Clap., must be maintained.

Not to be unjust towards Eisen, I must state that the incompleteness of Claparède's generic diagnoses and the inconsistencies of which that author was guilty in the arrangement of his species in the respective genera could not but cause the soundness of the latter to appear doubtful, especially to a naturalist who had only preserved materials to work upon, and could not by his own investigations learn the coincidence of the principal character indicated by Claparède, the colour of the blood, with other essential peculiarities. The reproach of inconsistency relates to the position of Claparède's *Pachydrilus lacteus*, which, indeed, plays an important part in Eisen's statement. This Enchytræan does not belong at all to the genus *Pachydrilus*, as appears from Claparède's own statements. It possesses colourless blood and "Les aiguilles sont parfaitement rectilignes, à l'exception de l'extrémité interne, qui est recourbée de manière à former un petit crochet" (1, p. 17). With *Pachydrilus proximus*, Czern.*, *Enchytræus Möbii*, aut.†, and *E. spiculus*, Leuck.‡, it forms a group of *Enchytræi* which could be arranged with the *Pachydrili* only on account of their marine habitat. The circumstance that they possess no dorsal pores is not of consequence, for many other species of *Enchytræus* want these without their position being thereby rendered doubtful.

The question now arises whether Eisen's system is to be completely rejected, or whether it may not be combined with

* (3) Czerniavsky, "Materialia a. zoograph. pontic. comparat. : Fasc. iii. Vermes," in Bull. Soc. Imp. Nat. Mosc. 1880, no. 2.

† (4) Michaelsen, 'Ueber *Enchytræus Möbii* und and. *Enchytræen*,' Kiel, 1886.

‡ (5) Frey und Leuckart, 'Beiträge zur Kenntniss der wirbellosen Thiere.' (Some time since my father sent me from Cuxhaven three living specimens of a whitish Enchytræid, about 10 millim. in length, which is undoubtedly identical with *E. spiculus*, Leuck. They possess delicate straight setæ, only a little bent at the inner extremity, standing in tufts of 4-6 (on the anterior segments often even 7-8) together. The cerebrum is posteriorly deeply emarginate, with the lateral margins converging in front, and it is rather longer than broad. The seminal funnels are broad, barrel-shaped, with the margins everted. A mature ovum exceeds the others considerably in size and occupies nearly the whole of the body-cavity in the twelfth segment. These worms, therefore, probably lay only one egg in each cocoon, unlike the other marine Enchytræidæ with which I am acquainted (see 4, pp. 8-9). The seminal pouches consist of a simple, thin-walled, pyriform principal part and a rather short, simple, straight, efferent duct. The worms were found below Cuxhaven outside the dyke, upon the ground overflowed by the sea at flood-tide.)

Claparède's. In order to decide upon this point I have subjected Eisen's genera to a thorough revision, in which it was no small advantage to me that I was able personally to investigate most of the species worked at by Eisen, and to compare them with the Enchytræidæ of our fauna. I take this opportunity of offering my best thanks to M. Gustav Eisen and to Prof. Sven Lovén, by whose kind intervention I was enabled to make these investigations upon the valuable arctic materials.

I arrived at the following result. Eisen's chief principle of classification, the more or less advanced fusion of the two halves of the cerebrum, when applied in too one-sided a fashion, leads to the establishment of unnatural genera. As such I must characterize the genera *Archienchytræus* and *Neoenchytræus*, which are separated from each other only by the form of the cerebrum. As evidence of the insufficiency of this principle of classification I may cite the two species of the genus *Buchholzia*, which will be treated in detail further on; their near relationship must strike every one who compares them. But according to the form of the cerebrum *B. appendiculata*, Buchh., must be referred to *Mesenchytræus*, while *B. fallax*, aut., possesses the cerebrum of an *Archienchytræus*. It would, however, be wrong to deny that the form of the cerebrum is of essential importance in some respects. In the second line we must assign it a certain significance in many Enchytræid-groups. Thus the two known species of the perfectly natural genus *Anachaeta*, Vejd., possess an almost exactly similar *Neoenchytræus*-cerebrum. In those *Enchytræi* also which group themselves around *E. hegemon*, Vejd.*, and which are distinguished by the constant presence of dorsal pores, by the unequal length of the setæ in the same tuft, and by the occurrence of lateral sacs on the *receptaculum seminis*, the *Neoenchytræus*-cerebrum predominates. (*E. lobifer*, Vejd., alone, according to that author, possesses a posteriorly emarginate cerebrum †.)

Further, those *Pachydrili* of which we know the form of the cerebrum, with the exception of *P. fossor*, Vejd. (*loc. cit.* pl. xiii. fig. 9), possess a cerebrum deeply emarginate at the posterior margin. Lastly, I might in this place cite a fourth natural group of Enchytræidæ in which a definite form of cerebrum is characteristic; but it first of all needs to be

* *E. hegemon*, *E. galba*, *E. Leydigii*, *E. lobifer*, *E. Perrieri*, Vejd., and *E. tenuis*, aut.

† (7) Vejdovsky, "Beitr. z. vergl. Morphol. d. Anneliden: I. Monographie der Enchytræiden" (Prague, 1879), pl. ix. fig. 3.

proved that the group is a natural one. I refer here to the genus *Mesenchytræus*, Eisen, which occupies a special position in Eisen's system, inasmuch as it is not founded, like the other two, solely upon the form of the cerebrum. In what follows I indicate the results of my comparative investigations upon Eisen's and the German *Mesenchytræi*. To this I shall append a description of the genus *Buchholzia*, so as then to pass to the establishment of a system of the Enchytræidæ such as, in my opinion, gives the best expression to the relationships existing in this family.

Genus MESENCHYTRÆUS, Eisen (2).

Enchytræus (*Mesenchytræus*), Vejd.*

Pachydrilus (*Mesenchytræus*), aut. (4).

The *Mesenchytræi* are Enchytræidæ with strongly sigmoidally-curved setæ (Pl. XVIII. fig. 1, *a*), without dorsal pores or salivary glands. They possess a large, distinctly recognizable cephalic pore, which is situated at the apex of the head-lobe or close to it, as has been described by me in *M. Beumeri* (4, p. 19, and 6, fig. 14). In this way they are essentially distinguished from the *Pachydrili*, in which the cephalic pore is small, and placed in the dorsal median line between the head-lobe and the cephalic ring. Eisen unfortunately has stated nothing about head-pores; but by means of serial sections I have been able to make out with certainty that in this respect *M. primævus* and *M. falciformis* exactly agree with *M. Beumeri*. Of three specimens of *M. mirabilis* which were at my disposal, the cephalic extremity had unfortunately been cut away behind the zone in two of them, while the third showed a slight injury to the head-lobe. Nevertheless I believe that in this last specimen I recognized a cephalic pore near the anterior margin of the head-lobe, but I cannot assert positively that I was not deceived by an artificial production. The *Mesenchytræi* (judging from our native species) possess colourless blood and a cardiac body, like that of many Polychæta, such as *Terebellides Strömii* and *Pectinaria belgica* †. Firmly attached to the inside of the wall of the vessel in the ventral median line, this traverses the whole of the dorsal vessel. It consists of cells of various sizes with distinct cell-walls and nuclei and a fine protoplasmic granulation. In *M.*

* (8) Vejdovsky, 'System. und Morphol. der Oligochæten,' Prague, 1884.

† (9) Michaelsen, "Ueber Chylusgefässsystem bei Enchytræiden," in Arch. für mikr. Anat. Band xxviii. (Bonn, 1886), p. 301, figs. 10 and 11.

mirabilis (fig. 3 *b*) and *M. primævus* it is thick, with irregular and often strong dilatations, and is multicellular in transverse section. In *M. falciformis*, *M. Beumeri* (fig. 1 *e*), and *M. flavidus* it is thinner, nearly smooth, with only slight dilatations, and exhibits only a few cells in transverse section. I have found a similar cardiac body in no other Enchytræid. It must probably be regarded as an ingrowth of the intestinal epithelium into the dorsal vessel, and therefore as homologous with certain organs in other Enchytræidæ, such as the intestinal diverticulum of the *Buchholziæ*.

The cerebrum of the *Mesenchytræi* (figs. 1 *c* and 2 *b*) is straightly truncated or only slightly concave behind. In front it is more or less deeply emarginate, and upon the anterior branches, which pass over into the commissures, the coating of ganglion-cells extends far forwards, even to the spot where the cephalic nerves branch off. Two pairs of muscles are attached to the cerebrum, one on the upper surface (figs. 1 *c* and 2 *b*, *om*), the other below (figs. 1 *c* and 2 *b*, *um*). At the posterior angles, and leaving these between them, they go off from the brain obliquely backwards, nearly parallel to each other. The segmental organs also exhibit an exceedingly characteristic development (see figs. 1 *d*, 2 *c*, and 3 *a*). They consist of a minute, funnel-shaped, anteseptale, and a large, remarkably irregular postseptale, usually furnished with lobate or capitate excrescences. A relatively wide vibratile canal traverses the anteseptale in a straight line; but in the postseptale it is so much twisted and so closely entwined that here the enveloping cell-substance is reduced nearly to a minimum. The irregular excrescences of the segmental organs have nearly the appearance of hernioidal diverticula of the vibratile canal. In Eisen's figures this characteristic course of the vibratile canal is not to be recognized; but in this respect his species do not differ from the German ones. From fig. 3 *a*, which is the exact representation of a tangential section through a segmental organ of *M. mirabilis*, it will be seen that Eisen (2, fig. 25) has represented the vibratile canal as much too spacious, so that these peculiar structural conditions have not been expressed. This applies also to the figures of the segmental organs of *M. primævus* and *M. falciformis* (2, figs. 24 and 26).

Finally, the sexual organs of the *Mesenchytræi* also exhibit peculiarities. The seminal ducts are short, at the utmost eight times as long as the seminal funnel. The spermatozoa and ova fall into the body-cavity before they have reached maturity, but they do not then float freely about in it. For their reception more or less deep, tubular, or sacciform poste-

rior inversions (spermatozoa-sacs and ovisacs) are formed by the dissepiments XI./XII. (for the spermatozoa) and XII./XIII. (for the ova). *M. Beumeri* possesses two spermatozoa-sacs, which extend, to the right and left of the intestine, as far as the posterior wall of segment XII. In *M. mirabilis* I found only one, which, however, perforates the following dissepiments, and extends into segment XXVI. Within the segments it is dilated; the dissepiments produce narrow constrictions upon it. A median ovisac stretches below the intestine in *M. flavidus* into segment XVII., in *M. Beumeri* and *M. falciformis* into segment XIX., and in *M. mirabilis* even into XXIX. The length of the sac may, however, be different in different individuals of the species. I have given the extremes noted by me. In *M. mirabilis* the ovisac also shows dilations and constrictions. In *M. Beumeri* and *M. flavidus* it is of uniform thickness throughout. The function of oviducts is performed by two symmetrical funnel-shaped inversions of the dissepiment XII./XIII., which open outwards by transverse slits in the ventral line of setæ, in front of the tufts of setæ of segment XIII. As probably in all Enchytræidæ, with the exception of the genus *Anachata*, Vejd., the seminal ducts in the *Mesenchytræi* are united and communicate with the intestine. This I have been able to ascertain positively in *M. falciformis*, *M. Beumeri*, and *M. flavidus*.

From all this it appears clearly enough that the genus *Mesenchytræus*, Eisen, is a natural one. As a second point, therefore, I find that it must be received into the system. Although the name *Mesenchytræus* was chosen only in opposition to *Archienchytræus* and *Neoenchytræus*, I will nevertheless retain it without adopting the latter, as the genus *Mesenchytræus* of Eisen's classification exactly coincides with this genus as defined by me.

I have detected two species in the German region, namely *M. Beumeri* and *M. flavidus*.

Mesenchytræus Beumeri, aut. (4).

Pachydriulus (Mesenchytræus) Beumeri, aut. (4).

I have elsewhere given an accurate description of this worm (4, pp. 44–46). I therefore confine myself to elucidating what was there stated with figures (Pl. XVIII. fig. 1).

As localities I can cite the marshes of the Elbestrand below Flottbeck, near Hamburg, the Borsstler Beck on the Baxtehud road behind Harburg, and the Eppendorfer Moor, near Hamburg. It lives chiefly under moss and bark on rotten black tree-stumps.

Mesenchytræus flavidus, nov. spec.,

is a rather dry-skinned worm of a yellowish colour, about 12 millim. in length. Its setæ are like those of *M. Beumeri* (fig. 1 *a*), and there are as many as five in a tuft. The lymph-corpuscles I have been able to observe only in preserved specimens. They are small and appear to be irregularly elongate-oval. The head-pore is situated at the apex of the head-lobe. The cerebrum (fig. 2 *b*) is slightly concave behind, deeply emarginate in front, with parallel lateral margins, and somewhat longer than broad. The segmental organs (fig. 2 *c*) are of irregular form, with the peculiarities above described as characteristic of the *Mesenchytræi*. The blood is colourless; the dorsal vessel originates in segment XIII. The seminal ducts (fig. 2 *d*) consist of a barrel-shaped seminal funnel with an everted margin and a short seminal canal, which is at the utmost five times as long as the funnel. The seminal canal leads into the wider pole of a pyriform penis and opens outwards through its narrower pole. The aperture is beset with small, lobiform, prostate glands. The oviducts are narrow and rather short. The seminal sacs (fig. 2 *a*) possess a simple efferent duct, furnished at its aperture with a slight bulbous dilatation, and a simple pyriform main portion, which communicates with the intestine at its apex. The cingulum, as in *M. Beumeri*, occupies the posterior half of segment XI. and the whole of segments XII. and XIII.

M. flavidus lives in yellow rotten tree-stumps in the Borstler Jäger, near Hamburg, and under moss in woods near Witten a. d. Ruhr in Westphalia.

Genus BUCHHOLZIA, aut. (9).

The peculiar circumstance that in the long-known species, first described by Buchholz * as *Enchytræus appendiculatus*, a displacement of the sexual parts has taken place, induced me, as it coincided with other essential peculiarities, to separate this Enchytræid from the genus *Enchytræus*, and to establish for it a distinct genus, to which I gave the name of *Buchholzia*. Investigations upon a species recently discovered by me, which comes so near to *B. appendiculata* that it cannot be separated from it by generic limits, compel me, however, to remove the definitions relating to the peculiarities of the sexual organs from the diagnosis of the genus. The new

* (10) Buchholz, "Beiträge zur Anatomie der Gattung *Enchytræus*," in Schriften d. physikal.-ökon. Gesellsch. z. Königsberg, 1862.

species (which I name *B. fallax*) shows the arrangement of the sexual organs which is normal in the Enchytræidæ. But even leaving out of consideration the definitions in question as given in the diagnosis formerly published, the genus *Buchholzia* must be sustained.

The *Buchholziæ* belong to the section of the Enchytræidæ with sigmoidally-curved setæ. They possess no dorsal pores, but have a head-pore, which is situated between the head-lobe and the cephalic ring. The lymph-corpuscles are present in both the known species in two forms (fig. 4 b), namely small, limpid, navicelliform, and without a recognizable nucleus, and larger, finely granulated, flat-ovate, with a distinct nucleus. They are the only Enchytræidæ provided with sigmoidally-curved setæ which possess salivary glands. These are very much reduced, stumpy, or at the utmost but little lobed, and they open laterally into the œsophagus, not close behind the pharynx, but further back, in segment IV. The blood is colourless. The dorsal vessel originates in segment VII. from the intestinal blood-sinus, upon a diverticulum produced by growth of the intestinal epithelium. The seminal ducts are long. The oviducts (judging of the whole genus from observations on *B. fallax*) are as I have found them in the other Enchytræidæ. The seminal sacs communicate with the intestine.

Buchholzia appendiculata, Buchholz.

Enchytræus appendiculatus, Buchholz (10).

Enchytræus (*Mesenchytræus*) *appendiculatus*, Vejd. (7 and 8).

Enchytræus (*Mesenchytræus*?) *appendiculatus*, aut. (4).

Buchholzia appendiculata, aut. (9).

The accurate descriptions which have been given of this interesting worm by the above-cited authors render any repetition of them here unnecessary.

I found this species in flower-pots and in garden-mould at Borgfelde, near Hamburg.

Buchholzia fallax, nov. spec.,

is a slender worm, about 10 millim. in length, of a white colour with a slight brownish tinge. The setæ (fig. 4 a) are strongly sigmoidally curved, and there are usually four or five, rarely six, in each tuft. The setæ of the same bundle are of different length, and so arranged that a ventral bundle and the corresponding superjacent lateral one turn the longer setæ towards each other. Head-pore as above described.

Lymph-corpuscles as shown in fig. 4 *b*. The salivary glands are still more reduced than those of *B. appendiculata*, stumpy, about six times as long as broad. The intestinal diverticulum (fig. 4 *c*) differs only in unimportant points from that of *B. appendiculata* (see 9, pp. 299, 300, figs. 7-9). I describe it below. The very narrow œsophagus at its passage into the wide stomachal part is somewhat invaginated in the latter, so that dorsally a broad pouch of no great depth is produced. From the bottom of this pouch proceed thin, sparingly branched, cæcal tubes (I believe I have seen more than two of them), which are brought together into a rounded convolution. The thickness of the tubes is not so uniform as in *B. appendiculata*, nor are they so closely squeezed together as in that worm. The membrane of the intestinal blood-sinus passes on to the intestinal diverticulum, surrounds it, and is continued forward directly into the wall of the dorsal vessel. In *B. fallax* the intestinal diverticulum is firmly attached to the œsophagus, and even half embraces it. A median longitudinal constriction, such as occurs in *B. appendiculata*, is entirely deficient. The cerebrum of our worm is emarginate before and behind, much longer than broad, with the lateral margins anteriorly convergent (fig. 4 *d*). The segmental organs consist of a small stumpy anteseptale and a flat, irregularly oval postseptale, with a rather short efferent duct.

The sexual organs show the arrangement normal in the Enchytræidæ. The seminal funnels are irregularly cylindrical, excentrically perforated, about three times as long as broad, with a widely everted margin. The seminal canals are long, and regularly packed together, very much in the way that ships' cables are laid together. The oviducts are like those of other Enchytræidæ. The seminal pouches are very elegant (fig. 4 *e*). The efferent duct is simple, rather long, with two pyriform glands at the orifice. The main portion is reversed-pyriform (with the broad pole turned towards the aperture), and communicates at the apex with the intestine. By depression and subsequent overgrowth there is produced in the wall of the main portion an annular canal, which is connected with the actual lumen of the part only by narrow fissures. This canal is destined for the reception of the semen; it is homologous with the side-pouches of the seminal sacs of *Enchytræus hegemon* and other Enchytræidæ. I have never found semen in the actual lumen of the main portion.

I will further mention that in one animal I found a connecting duct between two consecutive segmental organs, an abnormality such as Vejdovsky describes (8) in an *Anachæta*

bohémica. The anteseptale of the second segmental organ was much elongated, and passed anteriorly into the postseptale of the first one. The canal traversing the uniting piece showed active vibration. I will also describe another abnormality of pretty frequent occurrence. In some animals I found in segment VI., in another in VII. and VIII., and in others again in IX., in the ventral median line, verruciform hypodermal growths, which, both in optical longitudinal section and in transverse sections, had exactly the aspect of imperforate penes; even a central pit-like depression of the cuticle was recognizable. Their not being paired, indeed, was opposed to the notion that these growths were rudimentary penes; but if it should be proved that this supposition was nevertheless justified, there would be an interesting relation between the abnormal position of the sexual organs in *B. appendiculata* and these at present enigmatic organs.

B. fallax lives in rich, well-manured soil at Steinwärd, near Hamburg.

Classification of the Enchytræidæ.

A. Setæ sigmoidally curved.

* Head-pore large, at the apex of the head-lobe or near it. Salivary glands not present. Blood colourless; dorsal vessel with a cardiac body. Seminal ducts short, not more than eight times the length of the seminal funnel Genus *Mesenchytræus*, Eisen.

† Head-pore small, between the cephalic ring and the head-lobe. Seminal ducts long.

a. No salivary glands. Blood yellow or red. Dorsal vessel with no cardiac body Genus *Pachydrius*, Clap.

b. Short salivary glands opening into the œsophagus. The dorsal vessel originates upon an intestinal diverticulum in segment VII. Genus *Buchholzia*, Mich.

B. Setæ straight, with only a slight curvature at the inner extremity.

Head-pore small, between the cephalic ring and the head-lobe. Blood colourless. Dorsal vessel with no cardiac body. Salivary glands usually strongly developed. Seminal ducts long.

Genus *Enchytræus*, Henle.

C. Setæ aborted.

Head-pore large, at the apex of the head-lobe. Blood colourless. Dorsal vessel without cardiac body. An unpaired salivary gland lies on the intestine. Seminal ducts long, more or less regularly contorted, like a screw. Seminal sacs large, projecting freely into the body-cavity, not united with the intestine.

Genus *Anachæta*, Vejd.

I may be allowed to add to this systematic summary a few words of explanation. This combination of the two published systems was derived directly from the results of the preceding discussions. It differs very considerably from Vejdovsky's (8) former combination. Vejdovsky places the genus *Pachy-*

drilus side by side with the genus *Enchytræus*, and then divides the latter, in accordance with Eisen's principle of division, into the three subgenera *Mesenchytræus*, *Archienchytræus*, and *Neoenchytræus*. (He, however, retains for the different species the name of the principal genus *Enchytræus*.) Against this combination we have the circumstance that the true *Mesenchytræi* (at that time only Eisen's three species), as being Enchytræidæ without salivary glands, and with sigmoidally curved setæ, cannot be arranged under the genus *Enchytræus*; they come much nearer to the *Pachydrili*. As, further, the fourth species which Vejdovsky has placed in this subgenus, namely *Enchytræus* (*Buchholzia*, aut.) *appendiculatus*, Buchh., in my opinion is to be separated from the genus *Enchytræus*, Vejdovsky's subgenus of the species of *Enchytræus* with the cerebrum straightly truncated behind must altogether fall. I might, certainly, have divided the genus *Enchytræus* of my system into the subgenera *Archienchytræus* and *Neoenchytræus*, but I do not think that this would have produced a natural grouping. The genus *Enchytræus* for the present remains a collective genus. I have not yet thoroughly worked through the species of this genus, and I am therefore still without the insight necessary to enable me at present to state by what principles of division their breaking up into natural groups may best be effected. I believe, however, that by the changes which I have made in the classification, I have made a step in the right direction, on the road which will lead us to a satisfactory, natural classification of the interesting family of the Enchytræidæ.

EXPLANATION OF PLATE XVIII.

- Fig. 1.** *Mesenchytræus Beumeri*, aut. *a.* Bundle of setæ. *b.* Lymph-corpuscles. *c.* Cerebrum, seen from above; *c*, commissure; *k.n.*, cephalic nerve; *om*, upper, *um*, lower pair of cerebral muscles. *d.* Segmental organ. *e.* Transverse section of the dorsal vessel with the cardiac body. *f.* Seminal sac.
- Fig. 2.** *Mesenchytræus flavidus*, aut. *a.* Seminal sac. *b.* Cerebrum (references as in fig. 1 *c*). *c.* Segmental organ. *d.* Seminal duct.
- Fig. 3.** *Mesenchytræus mirabilis*, Eisen. *a.* Tangential section through a lobe of the segmental organ. *b.* Transverse section through the dorsal vessel, with the cardiac body.
- Fig. 4.** *Buchholzia fallax*, aut. *a.* Bundle of setæ. *b.* Lymph-corpuscles. *c.* Transverse section through the cesophagus, with the diverticulum (corresponding to the author's figure (9), fig. 8). *d.* Cerebrum (references as in fig. 1 *c*). *e.* Seminal sac.