



Oligochæta

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OLIGOCHÆTA.

BY ROWLAND SOUTHERN.

THE conditions prevailing on Lambay are not very favourable for Oligochæte worms. There is very little cultivated land, and very few trees. Beyond a few wells and boggy patches, there are no suitable places for the aquatic members of the order. Worms are, however, able to exist under very unfavourable conditions, and the collections have yielded a large number of species. Of the 34 species found on Lambay, 15 are new to the Irish fauna, and 10 of these to the Britannic fauna. Of the others, three are new to science.

One of the most striking characteristics of the Lambay Oligochætes is the great variability exhibited by some of the species, and this is especially the case among the Lumbricidæ. As a whole, the forms are of smaller size than on the mainland. For instance, 10 specimens of *Lumbricus rubellus* taken at random had an average length of 74 mm. The average length of an equal number from all parts of Ireland was 92 mm. The Enchytræidæ were also smaller than the corresponding forms on the mainland. The chief variations will be described under the various species.

The only family of Oligochætes which is sufficiently well known in Ireland, to be of any value for comparative purposes, is the Lumbricidæ, or Earthworms proper. No fresh records among these were made, even for Co. Dublin. The chief point of interest was the absence of such common forms as *Helodrilus longus*, *H. Eiseni*, *Lumbricus papillosus*, and *L. festivus*, which all occur on the mainland, close to Lambay. A closer examination, however, would be necessary before inferences could be drawn from the absence of these forms.

All figures (Plates 18, 19) are drawn from living specimens, unless stated otherwise.

List of Species.

Those marked × are new for the whole Britannic area; those marked * are new for Ireland, but are already recorded from Great Britain.

NAIDIDÆ.

Nais elinguis, Müll. Oerst.*

ENCHYTRÆIDÆ.

<i>Henlea ventriculosa</i> (Udek.)*	<i>Fridericia variata</i> , Bret. ×
<i>Dicksoni</i> (Eisen.) ×	<i>striata</i> (Levins.)*
<i>hibernica</i> , n. sp.	<i>Bretscheri</i> , nom. nov. ×
<i>Mesenchytræus setosus</i> , Mchlsn. ×	<i>aurita</i> , Issel. ×
<i>Marionina semifusca</i> (Clap.)*	<i>glandulosa</i> , n. sp.
<i>Enchytræus albidus</i> , Henle.	<i>connata</i> , Bretsch. ×
<i>Bucholzii</i> , Vejd.	<i>Perrieri</i> (Vejd.)*
<i>minimus</i> , Bret. ×	<i>polychæta</i> , Bret. ×
<i>argenteus</i> , Mchlsn.	<i>minuta</i> , Bret. ×
<i>Fridericia bulbosa</i> (Rosa). ×	<i>galba</i> (Hoff.)
	<i>Achæta minima</i> , n. sp.

LUMBRICIDÆ.

<i>Eiseniella tetraedra</i> (Sav.), typica.	<i>Helodrilus</i> (<i>Dendrobæna</i>) <i>rubidus</i>
<i>Eisenia fetida</i> (Sav.)	var. <i>subrubicunda</i> (Eisen.)
<i>rosea</i> (Sav.)	<i>mammalis</i> (Sav.)
<i>Helodrilus</i> (<i>Allolobophora</i>) <i>chloro-</i>	<i>Octolasion lacteum</i> (Orley).
<i>ticus</i> (Sav.)	<i>Lumbricus rubellus</i> , Hoffmstr.
<i>caliginosus</i> (Sav.), typicus.	<i>castaneus</i> (Sav.)
(<i>Dendrobæna</i>) <i>rubidus</i> (Sav.),	<i>terrestris</i> , L.
typicus.	

The arrangement of species is that adopted by Michaelsen in the "Tierreich" *Oligochaeta* (vol. x.), to which reference should be made for the full synonymy.

NAIDIDÆ.***Nais elinguis*, Müll.***

1891. N. E. Benham, *Q.J.M.Sc.*, vol. xxxiii., p. 212.

1900. Michaelsen. "Tierreich," vol. x., p. 25.

Several specimens were obtained from *Sphagnum*, near the Raven's Well. They were very minute, 1-2 mm. long, and consisting of only about 11 segments. No sexually mature forms were found. Numerous spherical corpuscles were observed, floating freely in the coelome. There was practically no difference between the ventral setæ of the anterior and posterior segments.

DISTRIBUTION—England—Oxford (Benham).

Western Europe; North America.

ENCHYTRÆIDÆ.

Special attention was paid to the Enchytræidæ of Lambay. The littoral forms were not of so much importance as those occurring inland, and only one species, *Marionina semifusca*, was collected. Altogether 21 species were obtained. The genus *Fridericia*, as usual, predominated with 11 species.

Henlea ventriculosa (Udek.)*

1896. Friend, *Essex Naturalist*, vol. ix., p. 110.

1900. Michaelsen, "Tierreich," vol. x., p. 69.

I have found this worm in various parts of Ireland.

DISTRIBUTION.—England—Essex (Friend). Common in Europe.

Henlea Dicksoni (Eisen). ×

1900. Michaelsen, "Tierreich," vol. x., p. 68.

Two specimens of this worm were found. They were very small, 4-5 mm. in length. Number of segments, 34. Salivary glands were not observed. Prostate gland very large. The brain is straight behind, not concave, as described. It is concave in front, and the sides diverge backwards. The spermatheca (Pl. 19, fig. 5.) consists of an oval ampulla, with an efferent duct twice as long as the ampulla. The duct leading into the œsophagus is equal in length to the efferent duct.

DISTRIBUTION.—Nova Zembla. Germany. Switzerland.

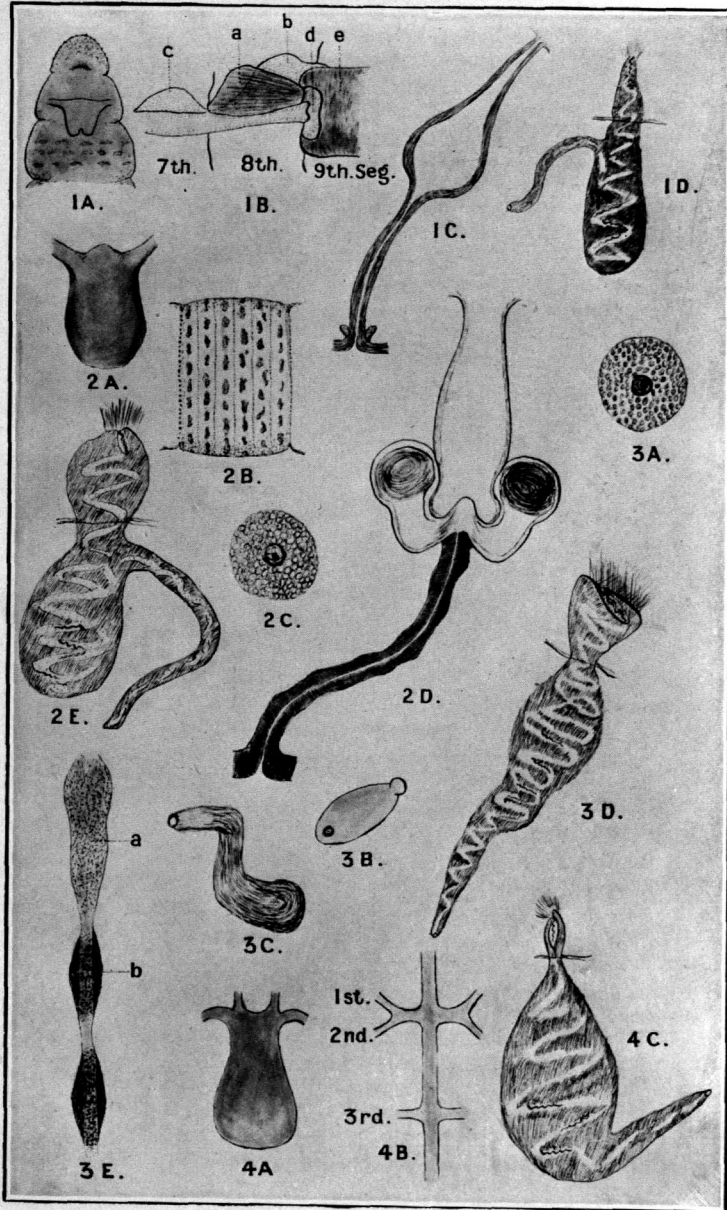
Henlea hibernica, n. sp.

Henlea hibernica is a stout worm of a greyish-white colour. It is very opaque, owing to the glandular epithelium.

Length, 15-20 mm. Number of segments, 60.

The head-pore shows as a large transverse slit, between the prostomium and the first body segment (Pl. 18, fig. 1A.) Ventral setæ 5-9 in a bundle, lateral setæ 5-7. They are slightly curved, and the inner ones are shorter than the outer ones. The clitellum occupies segments $\frac{1}{2}$ 11-13.

The brain (Pl. 18, fig. 1A), is longer than broad. It is slightly convex in front, and emarginate behind. The cœlomic corpuscles are circular discs, granular and nucleated. The salivary glands are long and twisted, lying on the ventral surface of the œsophagus. The œsophagus passes suddenly into the mid-gut at the boundary between the 8th and 9th segments (Pl. 18, fig. 1B). The œsophagus projects into the mid-gut, forming a valve-like structure (*a*). From the front of the mid-gut two œsophageal glands (*a*) project into the 8th segment. They lie dorso-laterally to the œsophagus. The dorsal vessel rises in the 8th-9th segmental groove, and has 3 contractile swellings in the 8th, 7th, and 6th segments (*b, c*). The nephridium (Pl. 18, fig. 1D), consists of a long narrow anteseptal portion, a broad post-septal $1\frac{1}{2}$ -2 times as long as the anteseptal. The duct rises near the septum. The sperm funnel is 3-4 times as long as broad, with parallel sides. The duct is fairly long.



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The spermatheca (Pl. 18, fig. 1C), consists of a pear-shaped ampulla, gradually narrowing till it enters the cesophagus. The duct is sharply defined, and is equal in length to the rest of the spermatheca. It frequently has several small glands at the external opening.

This species is very closely related to *Henlea nasuta* (Eisen). It differs from the latter in the number of setæ, in the shape of the nephridium and sperm funnel, but chiefly in the position of the two cesophageal glands, and the origin of the dorsal vessel, which has three contractile hearts and not two, as Vejdovsky states for *Henlea nasuta* (l., page 56). *Henlea nasuta* has not yet been found in Ireland. I have found *Henlea hibernica* in various places, including Co. Kerry, and the Boyne valley, Co. Meath, and all these specimens agree closely in their characters with each other.

Marlonina semifusca (Clap.)*

1900. Michaelsen, "Tierreich," vol. --, p. 76.

Worms belonging to this species were found under stones between tide marks near the harbour. The species was described by Claparède (l., p. 76), from specimens collected in the Hebrides. It does not seem to have been recorded since.

Mesenchytræus setosus, Mchlsn. x

1900. Michaelsen, "Tierreich," vol. x., p. 85.

1901. *Mesenchytræus megachætus*, Bretscher, *Revue Suisse Zool.*, vol. ix., p. 210.

1904. *M. setosus*, Bretscher, *Rev. Suisse Zool.*, vol. xii., p. 263.

Two specimens of this species were obtained in soil, in November. It appears to be mature in the winter, as immature forms were found in Co. Kerry in June. They agree very well with Michaelsen's description (2, p. 494), except that the brain may be straight, convex, or slightly emarginate behind. The dorsal vessel rises in the 16th segment, and is covered with greenish brown glands. The nephridium (Pl. 19., fig. 6), has a very long and narrow anteseptal; the post-septal consists of two large lobes. The sperm funnel is small, about twice as long as broad, and the duct is very short.

DISTRIBUTION.—Germany. Switzerland.

Enchytræus albidus, Henle.

1900. Michaelsen, "Tierreich," vol. x., p. 89.

1906. Southern, *Irish Naturalist*, vol. xv., p. 184.

This species was found in June with *Fridericia bulbosa*, in soil which had collected in a depression of the rocks, near Saltpan Bay. They were also found mature in November.

DISTRIBUTION.—Ireland, England, common in Europe, New Zealand, Kerguelen Island, &c.

Enchytræus Bucholzii, Vejd.

1900. Michaelsen, "Tierreich," vol. x., p. 90.

1906. Southern, *Irish Naturalist*, vol. xv., p. 184.

One mature specimen was found in November, in soil. Like the last-named species, it appears to be mature all the year round.

DISTRIBUTION.—Ireland, Europe, Patagonia, &c.

Enchytræus argenteus, Mchlsn.

1897. *Enchytræus parvulus*, Friend, *Zoologist*, ser. 4, vol. i., p. 349.

1902. " " " " *Irish Naturalist*, vol. xi., p. 110.

1900. Michaelsen, "Tierreich," vol. x., p. 91.

This species was recorded by Friend as the "Aster Worm." He afterwards recognised it as identical with *E. argenteus*, Mch. The name *Enchytræus parvulus* has since been applied to another species by Bretscher (1, page 18). It is common in soil, and is occasionally injurious to plants.

DISTRIBUTION.—Ireland, England, Germany, Switzerland.

Enchytræus minimus, Bretscher. ×

1899. Bretscher, *Revue Suisse Zool.*, vol. vi., p. 402.

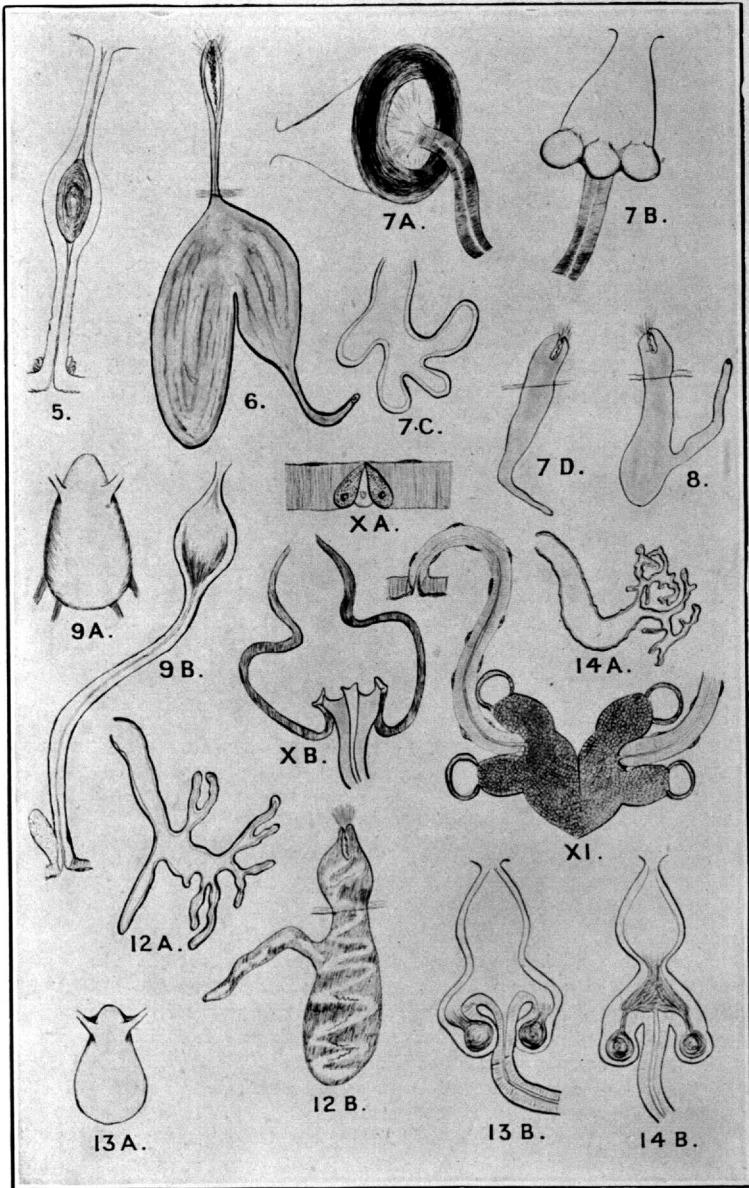
Several specimens were found on Lambay. I also found it in large numbers at Glencar, Co. Kerry. They agreed in all respects with Bretscher's description. Michaelsen (1, p. 93) stated that this species is probably the same as *E. argenteus*. After examining both species, I find there is no ground for this statement, and *E. minimus* must be regarded as a distinct species. Bretscher's paper was not illustrated, so I have given figures of the brain (Pl. 18, fig. 4 A), the nephridium (fig. 4 C), and the front part of the dorsal vessel (fig. 4 B). The two anterior branches of the latter, on each side, have a common origin. The anteseptal of the nephridium consists of the funnel only, a sharp distinction from *E. argenteus*. The specimens were very small, 2.5-3.5 mm. long. The dorsal vessel rises in the 13th segment.

DISTRIBUTION.—Ireland, Switzerland.

Fridericia bulbosa (Rosa). ×

1900. Michaelsen, "Tierreich," vol. x., p. 96.

This was the commonest Enchytræid on Lambay. It showed great variation in some of its characters. Length 10-12 mm. Setæ usually 4, occasionally 6 in a bundle. Brain longer than broad, concave or slightly convex in front; behind concave, convex, or straight. Salivary glands usually unbranched. Occasionally the distal end bifurcates once or twice (Pl. 19, fig. 7, C). The dorsal vessel rises in the 19th-21st segment. The post-septal of the nephridium (fig. 7 D) gradually merges into the duct. The sperm funnel is 3-6 times as long as broad. The spermatheca



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is very characteristic. When mature, the ampulla is very large and cone-shaped (fig. 7 A). At the base of the cone is a large ring-shaped diverticulum, which contains most of the sperm. In several specimens the ring of the spermatheca on one side of the body seemed to be broken up into diverticula-like pouches (fig. 7 B), whilst the spermatheca on the other side was normal. The cœlomic corpuscles are of two sizes, some large, clear, and disc-shaped, others small and spindle-shaped.

DISTRIBUTION.—Germany, Switzerland, Italy, Nova Zembla, Philadelphia.

Fridericia variata, Bretscher. ×

1902. Bretscher, *Rev. Suisse Zool.*, p. 19.

Bretscher described this species as resembling *F. bulbosa* in everything except the nephridia and the position of the spermatheca. In the nephridia (Pl. 19, fig. 8), the duct may rise from any part of the post-septal, whereas in *F. bulbosa* it always rises from the end. The spermatheca are connected with the gut in the dorsal mid-line, instead of laterally, as in *F. bulbosa*. I found specimens on Lambay, which differed from the typical form of *F. bulbosa* in these two points only. As regards the nephridia, the point of origin of the duct is very variable in many species of this genus. The second difference does not seem of much importance. Under these circumstances, and taking into consideration also the fact that the two forms were obtained from the same locality, I am inclined to regard *F. variata* as only a variation of *F. bulbosa*, which is liable to occur in different localities.

DISTRIBUTION.—Switzerland.

Fridericia striata (Levins).*

1898. Friend, *Zoologist*, p. 121.

1900. Michaelsen, "Tierreich," p. 96.

This species is easily recognised by its spermatheca, which have two large glands at the external aperture. It was recorded by Friend from Yorkshire in 1898.

DISTRIBUTION.—England, Denmark, Germany, Switzerland, Chili, Uruguay.

Fridericia Bretscheri. nom. nov. ×

1902 *Fridericia parva*, Bretscher, *Rev. Suisse Zool.*, p. 25 (non *F. parva*, Moore in *Proc. Acad. Phil.* 1895, p. 343.)

The name *F. parva* given to this species by Bretscher, had already been used by Moore, so I have changed it to *F. Bretscheri*, after Professor Bretscher, of Zurich, who first described it.

Numerous specimens were obtained from Lambay. Whilst corresponding well with Bretscher's Swiss species, there are several differences. The setæ are usually four in a bundle, though in one specimen only two were

found. The salivary glands are long sacs, and not branched, as Bretscher states. Length, 6 mm. The epidermis bears several rows of large green glands in each segment. The coelomic corpuscles are large, granular, oval to round. The dorsal vessel rises in the 17th or 18th segment. First dorsal pore in the 7th segment. The brain projects prominently in front (Pl. 19, fig. 9 A). The spermatheca (fig. 9 B) consists of a small oval ampulla, lying dorsally on the oesophagus. The duct is very long, and there is a single large gland at the external aperture.

DISTRIBUTION.—Switzerland.

Fridericia aurita, Issel. ×

1905. Issel, *Zool. Jahrb.*, vol. xxii., p. 468.

This species was found in large numbers. It is easily recognised by the characteristic diverticula of the spermatheca.

Length, 10–18 mm. Setae usually four in a bundle, sometimes not more than three. The oesophagus is covered with large greenish glands. The dorsal vessel rises in the 21st segment. The dorsal pores begin in the 7th segment. They are surrounded by four or five pear-shaped gland cells (Pl. 19, fig. x A). In the anterior segments, the duct of the nephridium rises from the middle of the post-septal. In the posterior segments it rises from the base. The spermatheca consists of a long duct and a pear-shaped ampulla, bearing two ear-shaped diverticula near its base. The ampulla is constricted near the junction with the diverticula. Occasionally small glands are found near the external opening of the duct. The appearance of the spermatheca varies very much, according to its degree of maturity. When filled with sperm, the diverticula appears more cylindrical than ear-shaped. A figure showing the appearance of the ampulla, after the expulsion of the sperm, is given (fig. x B).

DISTRIBUTION.—Piedmont, Italy. (700–1,150 metres).

Fridericia minuta, Bret. ×

1900. *Fridericia minuta*, Bret., *Rev. Suisse Zool.*, p. 33.

1900. *Fridericia auriculata*, Bret., *ib.*, p. 34.

In 1902 Bretscher (1, p. 22) united these two forms, which he had previously regarded as distinct. The Lambay specimens agree very closely with his description. Setae, 6–7 in a bundle. The dorsal vessel rises in the 18th–21st segment. The two anterior branches on each side are given off separately. The salivary glands (Pl. 19, fig. 14 A) divide into several short branches at the distal end. The nephridia vary in form according to their position. There are no glands at the external opening of the spermatheca. The two diverticula are cylindrical, and the ampulla is slightly constricted off from the diverticula at its base (fig. 14 B). Length, 10–15 mm.

DISTRIBUTION.—Switzerland.

Fridericia connata, Bret. ×

1902. Bretscher, *Rev. Suisse Zool.*, p. 20.

Several specimens of this worm were obtained. Bretscher states in his description, that it resembles *F. bisetosa* closely, except as regards the form and disposition of the spermathecae. The remarkable feature about the latter organs, in *F. connata*, is that they lie dorsally on the œsophagus, and the basal parts of the ampulla are fused (Plate 19, fig. 11). The diverticula have long stalks, with hemispherical receptacles for the sperm. The ampulla and stalks are coarsely granular. The duct is long, and dotted with unicellular glands. In *F. bisetosa* the diverticula are globular and almost sessile, the ampulla is small, not granular, and enters the œsophagus laterally. In *F. connata* the epidermis round the spermatheca pore is very glandular. The salivary glands are twisted, but unbranched. The dorsal vessel rises in the 23rd segment. In *F. bisetosa* it rises in the 18th segment. Length, 10–20 mm. Setæ, 2 in a bundle. Brain twice as long as broad, convex behind. Corpuscles large and disc-shaped. The duct of the nephridium rises variously on the post-septal.

DISTRIBUTION.—Switzerland.

Fridericia Perrieri (Vejd.).*

1900. Michaelser, "Tierreich," vol. x, p. 98.

Friend (1, p. 196) recorded this species from England, but gave no details of its structure. The specimens from Lambay, and others from various parts of Ireland, which I refer to this species, show several points of difference from those described by Vejdovsky (1, p. 58). In the first place, the salivary glands (Pl. 19, fig. 12 A) bear only a distant resemblance to the figure given by Vejdovsky, though it is just possible to say that the branches rise in two bundles. Secondly, the anteseptal of the nephridium (fig. 12 B) is oval, not slender, and the duct rises from the front or middle of the post-septal. Vejdovsky does not state the origin of the dorsal vessel. In my specimens it rises in the 22nd segment. The Lambay specimens agree with Vejdovsky's description as regards size, brain, setæ, spermathecae, sperm-funnel, and in the common origin of the two anterior branches of the dorsal vessel. On the whole, the evidence points to the identity of these specimens with *F. Perrieri*.

DISTRIBUTION.—Denmark, Bohemia, Switzerland, Italy, Germany, England (?).

Fridericia polychæta, Bret. ×

1900. Bretscher, *Rev. Suisse Zool.*, p. 450.

This species was obtained in November in soil and moss. In several points the specimens differed from Bretscher's description. They are 15–25 mm. long. The epithelium is somewhat opaque, owing to the presence of

several rows of dark glands in each segment. Ventral setæ, 7-9, occasionally 10; lateral setæ, 5-8. The dorsal pores commence in the front of the 7th segment. The girdle occupies segs. 12- $\frac{1}{2}$ 13. It is very prominent, and composed of closely-set glands. The brain (Pl. 19, fig. 13 A) projects in front. Bretscher describes it as concave. The salivary glands have numerous small, short branches. The dorsal vessel rises in the 22nd segment. The two anterior branches originate separately. The spermatheca (fig. 13 B) has two stalked diverticula, which curve in towards the duct. There are no glands at the external opening of the duct.

DISTRIBUTION.—Switzerland.

***Fridericia glandulosa*, n. sp.**

Only one specimen of this worm, fortunately mature, was obtained in October.

Length, 25 mm. Setæ, 6-8 in a bundle. The worm is very opaque, and the internal organs are difficult to observe. The opacity is due to the large number of dark glands on the epidermis. In each segment (Pl. 18, fig. 2 B) there are about 7 rows of minute dotted glands, alternating with rows of large irregular glands. These glands are very numerous and conspicuous on the 4th and 5th segments, in the vicinity of the openings of the spermathecae. The girdle occupies segments 12- $\frac{1}{2}$ 13. It is covered with a mosaic pattern of granular glands, roughly arranged in rows, with clear intermediate spaces. The brain (fig. 2 A.) is 1 $\frac{1}{2}$ times as long as broad, projecting in front, and convex behind. The coelomic corpuscles are oval to round (fig. 2 C), finely granular. The salivary glands were not observed with certainty, but they appeared to be long and tubular, apparently dividing into two long branches, which stretched into the 6th segment. The nephridia (fig. 2 E) are composed of a large anteseptal portion, and a somewhat larger post-septal. The duct rises near the septum, and is longer than the post-septal. The spermatheca (fig. 2 D) has two large-stalked diverticula swollen at the distal end. They curve round, away from the duct, and lie alongside the ampulla. The latter is long, and not very wide. The duct is dotted with flat, unicellular glands. There are no glands at the opening. The sperm-funnel is several times longer than broad. The sperm-duct ends in a large prostate.

This species resembles *F. polychata* more than any other. It is distinguished from those members of the genus which have two-stalked diverticula, by (1) the number of setæ, (2) glands of the epithelium, (3) salivary glands, (4) form of the spermathecae.

***Fridericia galba* (Hoff.).**

1898. Friend, *Irish Naturalist*, vol. vii., p. 196.

1900. Michaelsen, "Tierreich," p. 101.

This species has already been recorded from Ireland by Friend. It is fairly common here. In all the specimens I have examined, the duct of

the nephridium rises near the front end, or middle of the post-septal. Vejdovsky (I, Pl. vii., fig. 4) figures it as rising near the posterior end. The dorsal vessel rises in the 21st segment. In one specimen there were three diverticula on one spermatheca, four on the other.

DISTRIBUTION.—Ireland. Europe.

***Achæta minima*, n. sp.**

Only one specimen of this new worm was found in soil from Lambay. Fortunately it was fully mature when I found it in June. Owing, however, to its small size and fragile nature, only a brief examination of the living animal was possible. After it was stained and mounted, some of the organs could not be made out clearly, and the description of them must be left over till more material is available. Sufficient was seen to mark it as a distinct species of this remarkable genus.

Achæta minima is a minute, transparent worm, 3 mm. long. Number of segments 22. A large head-pore is present at the tip of the prostomium. Of the internal glands representing the setæ only the dorsal pair are present. These are oval cells with the nucleus at the distal end (Pl. 18, fig. 3 B). The epithelium is faintly dotted with glands. The girdle occupies the 12th segment. Its glands are in transverse rows. The brain is about $1\frac{1}{2}$ times as long as broad. It is convex before and behind. The sides converge to the anterior end, which, in the preserved state, is much narrower than the posterior. The ganglia of the ventral nerve cord are very conspicuous when stained. The ganglia of the first four segments are united into a single large mass (fig. 3 E, a). The edges of the ganglia appear to be curved round to the ventral side (b). The septal glands lie in the 4th, 5th, and 6th segments, those in the 6th being very large. The cœlomic corpuscles (fig. 3 A) are circular discs, nucleated, coarsely granular, and brown in colour. The salivary glands could not be made out with certainty. The alimentary canal is covered with large brown cells. The dorsal vessel rises in the 6th segment, and there are three dilations in the 6th, 5th, and 4th segments, those in the 6th and 5th being very large. The nephridia (Fig. 3 D) commence in the 6/7 septum. The anteseptal is almost semicircular in outline, with a straight anterior border. The post-septal is 4-5 times as long, and is not distinct from the duct. The duct is not dilated, and there are no glands at the external pore. The sperm-funnel is 4-6 times as long as broad. The duct is long and spirally wound, as in *A. Eiseni*, but more loosely. The spermathecæ (fig. 3 C) are simple sacs lying in the 5th segment, and opening ventrally. They lie at the sides of the cesophagus. There is no distinction between ampulla and duct.

This species is most nearly related to *A. bohemica* (Vejl.), which it resembles in only having the dorsal setal glands developed, and also in the vascular system. It is distinguished from it by its small size, cœlomic corpuscles, nephridia, and spermathecæ.

LUMBRICIDÆ.

Eleven species and one variety belonging to this family were collected on Lambay. In the whole Irish fauna, twenty species and three varieties are known. The Lambay Lumbricidæ are of interest, chiefly because of the great variability shown by some of the species. Some forms common on the adjacent mainland were not found at all.

Eiseniella tetraëdra (Sav.), *typica*.

1893. Friend. *Allurus tetraëtrus*, + *A. t.* var. *obscurus* + *A. t.* var. *luteus* + *Allurus amphispæna* + *Allurus flavus*. *Proc. Roy. Ir. Acad.* (3), vol. ii, p. 462.

1900. Michaelsen, "Tierreich," p. 471.

This semi-amphibious Earthworm was found in all places sufficiently damp for it. It is common in Ireland.

DISTRIBUTION.—Common in Europe.

Eisenia foetida (Sav.).

1836 *Lumbricus annularis*, R. Templeton, *Mag. Nat. Hist.*, vol. ix, p. 234.

1900. Michaelsen, "Tierreich," p. 475.

In garden soil, at the castle.

DISTRIBUTION.—Common in Europe, Asia, North America. Introduced into various parts of the world.

Eisenia rosea (Sav.).

1893. *Allolobophora mucosa*, Friend, *Irish Naturalist*, p. 122.

1900. Michaelsen, "Tierreich," p. 478.

1900. ? *Eisenia rosea*, var. *macedonica* (Rosa). Michaelsen, "Tierreich," p. 479.

The Lambay worms referable to this species vary widely in some of their characters. The variety *macedonica* was first separated from the type form by Rosa (l., p. 428), because of the presence of small ventral papillæ on segments 26-33, at the border of the girdle. The Lambay specimens include all intermediate forms, from worms with no papillæ at all, to forms with papillæ on segments 9-12, 24 and 25, and 27-33. The girdle occupies segments 25, 26- $\frac{1}{2}$ 32, 32. Taking these facts into consideration, it does not seem justifiable to regard the form *macedonica* as a distinct variety. The male pores may be small, and confined to the 15th segment, or large, and slightly overstepping it. The tubercula pubertatis are on segments 29-31. In one specimen they only occupied segments 29-30.

DISTRIBUTION.—Common in Europe, Asia, North America.

Helodrilus (Allolobophora) caliginosus, (Sav.) *typicus*.

? 1836. *Lumbricus gordianus* + *Lumbricus lividus*, R. Templeton, *Mag. Nat. Hist.*, vol. ix., p. 135.

1893. *Allolobophora turgida*, Friend, *Irish Naturalist*, p. 122.

1900. Michaelsen, "Tierreich," p. 483.

Common in Ireland.

DISTRIBUTION.—Common in Europe; North America.

Helodrilus (Allolobophora) chloroticus (Sav.).

1865. *Lumbricus viridis*, Johnston, "Cat. Brit. Non-par. Worms," p. 60.

1893. *Allolobophora cambrica*, Friend, *Irish Naturalist*, vol. ii., p. 122.

1893. *Allolobophora chlorotica*, Friend, *loc. cit.*

1900. Michaelsen, "Tierreich," p. 486.

Very common on Lambay. Some of the specimens showed great variation from the type. In one specimen the right side was normal, but on the left the male pore was on the 16th seg., and the tubercula pubertatis consisted of papillæ on segments 31-36 inclusive. Another specimen showed a similar abnormality, except that the male pores were both on the 15th segment. In a third specimen the tubercula on the left side were only on segments 31 and 33.

DISTRIBUTION.—Common in Europe and North America. Introduced species in many parts of the world.

Helodrilus (Dendrobæna) rubidus (Sav.) *typicus*.

1892. *Allolobophora (Dendrobæna) arborea*, Friend, *Journ. Linn. Soc., Zool.*, vol. xxiv., p. 301.

1893. *Dendrobæna arborea*, Friend, *Irish Naturalist*, vol. ii., p. 239.

1900. Michaelsen, "Tierreich," p. 490.

One specimen of this rare form was found on Lambay. There were no papillæ on the 16th segment. The girdle occupies segments 26-31. The tubercula pubertatis are on segments 29 and 30.

DISTRIBUTION.—British Isles (rare), Germany, France, Switzerland, Siberia.

Helodrilus (Dendrobæna) rubidus, var. *subrubicunda* (Eisen.).

1836. ? *Lumbricus xanthurus*, R. Templeton, *Mag. Nat. Hist.*, vol. ix., p. 235.

1893. *Allolobophora subrubicunda*, Friend, *Irish Naturalist*, p. 238.

1900. Michaelsen, "Tierreich," p. 490.

This worm is very common in Ireland. The Lambay specimens were very variable. One was remarkable for the number and size of the papillæ on which the ventral setæ were placed. These papillæ

occurred on segments 16, 17, 23-34. They were especially large on segments 33 and 34, occupying the whole ventral surface, and fairly large on segments 24 and 30. The girdle of this specimen occupied segments 25-32. The tubercula pubertatis were also very variable. In some cases they were divided by the intersegmental furrows, in others they were continuous.

DISTRIBUTION.—Europe, North America.

Helodrilus (Dendrobæna) mammals (Sav.).

1893. *Allolobophora (Dendrobæna) celtica* (Rosa). Friend, *Irish Naturalist*, p. 219.

1893. *Allolobophora celtica*, var. *rosea*, Friend, *Irish Naturalist*, p. 220.

1900. Michaelsen, "Tierreich," p. 493.

This worm is very common in Ireland.

DISTRIBUTION.—British Isles, France.

Octolasion lacteum, Orley.

1893. *Allolobophora profuga*, Rosa. Friend, *Irish Naturalist*, vol. ii, p. 121.

1900. Michaelsen, "Tierreich," p. 506.

This species seems to be fairly common in the British Isles.

DISTRIBUTION.—Central and South Europe, North Africa, &c.

Lumbricus rubellus, Hoff.

1893. Friend, *Irish Naturalist*, vol. ii, p. 8.

1900. Michaelsen, "Tierreich," vol. x., p. 509.

This is the commonest Earthworm in Ireland.

DISTRIBUTION.—Europe, Asia, North America.

Lumbricus castaneus (Sav.).

1893. *Lumbricus purpureus* (Eisen). Friend, *Irish Naturalist*, vol. ii, p. 8.

1900. Michaelsen, "Tierreich," vol. x., p. 510.

Very common in Ireland.

DISTRIBUTION.—Europe, North America.

Lumbricus terrestris, L.

1856. Thompson, "Nat. Hist. of Ireland," vol. iv., p. 428.

1900. Michaelsen, "Tierreich," p. 511.

This species, though known as the "Common Earthworm," is not by any means so common as many others. Two specimens were obtained on Lambay. One of these had large ventral papillæ on segments 31-38.

DISTRIBUTION.—Europe, North America.

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DESCRIPTION OF PLATES.

PLATE 18.

- Fig. 1. A.—Anterior region of *Henlea hibernica*, n. sp., showing head-pore, brain, and glands on epidermis.
B.—*a*, Oesophageal glands of *H. hibernica*; *b*, *c*, dilations of the dorsal vessel; *d*, projection of oesophagus into mid-gut; *e*, mid-gut.
C.—Spermatheca of *H. hibernica*.
D.—Nephridium of *H. hibernica*.
- Fig. 2. A.—Brain of *Fridericia glandulosa*, n. sp.
B.—Segment of *F. glandulosa*, showing glands.
C.—Cœlomic corpuscle of *F. glandulosa*.
D.—Spermatheca of *F. glandulosa*.
E.—Nephridium of *F. glandulosa*.
- Fig. 3. A.—Cœlomic corpuscle of *Achaeta minima*, n. sp.
B.—Setal gland of *A. minima*.
C.—Spermatheca of *A. minima*.
D.—Nephridium of *A. minima*.
E.—Anterior region of ventral nerve-cord of *A. minima*—*a*, massed ganglia of 1-4 segments; *b*, folded border of the ganglion.
- Fig. 4. A.—Brain of *Enchytraeus minimus*, Bret.
B.—Anterior region of dorsal vessel of *E. minimus*, showing common origin of 1st and 2nd branches.
C.—Nephridium of *E. minutus*.

PLATE 19.

- Fig. 5. Spermatheca of *Henlea Dicksoni* (Eisen).
Fig. 6. Nephridium of *Mesenchytræus setosus*, Mchlsn

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- Fig. 7. A.—Spermatheca of *Fridericia bulbosa* (Rosa).
 B.—Spermatheca of *F. bulbosa* (Rosa), showing the lobed appearance of the ampulla.
 C.—Termination of salivary gland of *F. bulbosa*.
 D.—Nephridium of *F. bulbosa*.
- Fig. 8. Nephridium of *Fridericia variata*, Bret.
- Fig. 9. A.—Brain of *Fridericia Bretscheri*, nom. nov.
 B.—Spermatheca of *F. Bretscheri*.
- Fig. x. A.—Dorsal pore of *Fridericia aurita*, Issel, showing the gland-cells surrounding it.
 B.—Spermatheca of *F. aurita*, after expulsion of the sperm.
- Fig. xi. Spermatheca of *Fridericia connata*, Bret.
- Fig. 12. A.—Salivary gland of *Fridericia Perrieri* (Vejd.).
 B.—Nephridium of *F. Perrieri*.
- Fig. 13. A.—Brain of *Fridericia polychata*, Bret.
 B.—Spermatheca of *F. polychata*.
- Fig. 14. A.—Salivary gland of *Fridericia minuta*, Bret.
 B.—Spermatheca of *F. minuta*.

POLYZOA.

BY A. R. NICHOLS, M.A., M.R.I.A.

The following Polyzoa were obtained during three days' shore collecting at Lambay, Easter, 1906 :—

- Eucratea chelata** (L.)—A specimen on *Sertularia operculata* from Talbot's Bay.
- Gemellaria lorleata** (L.)—Common on shore north of harbour.
- Scrupocellaria scruposa** (L.)—A specimen.
- S. reptans** (L.)—Very common, especially on *Flustra foliacea*.
- Bugula avicularia** (L.)—A specimen.
- Cellaria fistulosa** (L.)—Common.
- Flustra foliacea** (L.)—Very common on shore north of harbour.
- F. papyracea** (E. & S.)—A specimen on shore north of harbour.
- Membranipora pilosa** (L.)—Common everywhere.
- M. membranacea** (L.)—Very common on fronds of *Laminaria*.
- M. lineata** (L.)—On a stone from low-water mark near Carrickdorrish.
- Cribrilina punctata** (Hassall).—On stones, common.
- Microporella ciliata** (Pallas).—A specimen.
- M. impressa** (Audouin).—On valves of *Mytilus edulis* from Talbot's Bay.