

OLIGOCHAETA.

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PLATE I.

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INTRODUCTION.

THE Oligochaeta previously recorded from Co. Mayo consist of the following five species of earthworms, which were obtained some years ago on Clare Island:—

- Helodrilus (? Allolobophora) relictus *Southern*.
- H. (Dendrobaena) rubidus, *var. subrubicunda* (*Eisen*).
- H. (Dendrobaena) octaedrus (*Savigny*).
- Lumbrius rubellus (*Hoffmeister*).
- L. festivus (*Savigny*).

In connexion with the present Survey, a few days were devoted in May, 1909, to collecting the land and freshwater species on Clare Island. No similar collections were made on the mainland, with the exception of a few Enchytraeids collected on the Mullet near Blacksod, where a few littoral species were also obtained. A few earthworms were also collected at various points on the mainland, by other workers.

Clare Island itself is a very unfavourable locality for Oligochaetes, owing to the absence of trees; and consequently the large number of species which are usually found under the bark of decaying and fallen trees are absent. The greater part of the surface soil is also liable to severe desiccation during spells of fine weather, and earthworms can then only be found in the cultivated patches. Such conditions prevailed during my visit in May, 1909. The pools lie mostly in boggy ground, and contain very few species of Oligochaetes.

The present paper must be regarded as very incomplete in all groups. Only 34 species were obtained, as against 102 for the whole of Ireland. Very large additions to the list would have been made if the adjacent mainland had been searched, especially in the groups usually associated with trees and fresh water. The fauna of Clare Island itself is, however, almost certainly very poor.

The following is a list of the species obtained, those not previously recorded from Ireland being marked with an asterisk:—

- NAIDIDAE.— Chaetogaster diastrophus (*Grwith.*)
 *Nais communis *Piguet.*
- TUBIFICIDAE.— Clitellio arenarius (*Müller.*)
 Tubifex Benedeni (*Udekem.*)
- LUMBRICULIDAE.— Lumbriculus variegatus (*Müller.*)
- ENCHYTRÆIDAE.— Henlea ventriculosa (*Udekem.*)
 Marionina sphagnetorum (*Vejd.*)
 M. semifusca (*Claparède.*)
 Lumbricillus verrucosus (*Claparède.*)
 *L. profugus (*Eisen.*)
 L. Evansi *Southern.*
 Enchytraeus albidus *Henle.*
 E. Bucholzii *Vejd.*
 E. cliarensis *sp. n.*
 Grania maricola *gen. et sp. nov.*
 Fridericia bulbosa (*Rosa.*)
 F. bisetosa (*Levinsen.*)
 F. minuta *Bretscher.*
 Achaeta bohemica (*Vejd.*)
 *A. Cameranoi *Cognetti.*
- LUMBRICIDAE.— Eiseniella tetraedra (*Savigny*), *typ.*
 Eisenia rosea (*Savigny.*)
 Helodrilus (Allolobophora) caliginosus (*Savigny typ.*)
 H. (? Allolobophora) relictus *Southern.*
 H. (A.) chloroticus (*Savigny.*)
 H. (Dendrobaena) rubidus, *var. subrubicunda (Eisen).*
 H. (D.) mammalis (*Savigny.*)
 H. (D.) octaedrus (*Savigny.*)
 H. (Bimastus) Eiseni (*Levinsen.*)
 Octolasion lacteum (*Örley.*)
 Lumbricus rubellus *Hoff.*
 L. castaneus (*Savigny.*)
 L. terrestris *L.*
 L. festivus (*Savigny.*)

In addition to the two new species described, *Nais communis* Piguet, and *Lumbricillus profugus* (Eisen), have not previously been recorded from the British Isles. The latter species has not been found since it was described by Eisen in 1879, in material collected in Greenland; see p. 5.

FAUNISTIC NOTES.

The following species were found between tide-marks, usually under stones, in muddy gravel, or in weeds from rock-pools:—

Clitellio arenarius.	Lumbricillus profugus.
Tubifex Benedeni.	L. Evansi.
Marionina semifusca.	Enchytraeus albidus.
Lumbricillus verrucosus.	E. cliarensis.

Apparently no species belonging to the order Oligochaeta has yet been recorded from below low-water mark. Considerable interest therefore is attached to the discovery of the remarkable form *Grania maricola*, described in the present paper. Its unique characters have necessitated the creation of a new genus, belonging to the family Enchytraeidae. It was dredged on a bottom of sand and shells in 24 fathoms in Clew Bay. The same species has since been found at a depth of 20 fathoms on a bottom of fine gravel and sand in Dingle Bay, whilst an immature specimen probably belonging to this species was found between tide-marks in the sand of a *Zostera* bed in Blacksod Bay. A second species belonging to the genus *Enchytraeus*, unfortunately immature, was dredged in 9-11 fathoms in Clew Bay. I have found an immature specimen belonging to the family Tubificidae living at a depth of 40 fathoms in the middle of the Irish Sea, whilst mature individuals belonging to the same family were dredged in 3 fathoms in Crookhaven Harbour. It is obvious, then, that our present conceptions of the distribution of Oligochaetes as limited by low-water mark must be considerably modified. They are regarded as being recent immigrants from land and fresh water into the littoral region, but in view of the isolated position and remarkable structure of *Grania maricola*, this theory will have to be reconsidered when our knowledge of the marine species has been sufficiently enlarged. Ehlers' records fragments of Oligochaetes from very great depths (725 fathoms); but it seems highly probable from the description of the fragmentary and immature specimens that they belong to the order Polychaeta.

The fresh-water group is small, comprising only the three species *Chaetogaster diastrophus*, *Nais communis*, and *Lumbriculus variegatus*, the two former occurring in weeds from the stream flowing from Lough Avullin,

¹ EHLERS, E. : "Beiträge zur Kenntniss der Verticalverbreitung der Borstenwürmer im Meere," Zeitsch. f. wissen. Zoologie, Bd. xxv, 1875, p. 13.

whilst the last-named is extremely abundant in the Sphagnum pools on the bogs.

The remaining species were found in soil. The occurrence of *Enchytraeus albidus* in old gulls' nests on the Bills is noteworthy.

The nomenclature and distribution are given only of those species which were not recorded in my former paper,¹ to which reference may be made for further particulars.

There is nothing distinctive of the Oligochaete fauna of Clare Island except its poverty.

SYSTEMATIC PART.

Family NAIDIDAE.

Nais communis Piguët.

1906. *Nais communis* Piguët. Revue Suisse de Zoologie, t. xiv, p. 247.

In some weeds received from a stream on Clare Island I found this species in large numbers. They lived in a small aquarium for some weeks, and became genitally mature in June and July, thus agreeing with Piguët's observations. All the specimens were actively budding, a chain usually consisting of three zooids. This species is able to swim actively through the water. The shape of the head and nephridia, and the structure of the setae, and especially of the genital setae, agree closely with the description and figures given by Piguët. Brown pigment was plentiful on the anterior segments.

This species has not previously been recorded from the British Isles.

Habitat.—In weeds from stream on Clare Island, April, 1909.

Distribution.—Widely spread in Switzerland. Two varieties of this species described by Stephenson² from Travancore and the Punjab.

Chaetogaster diastrophus (Gruith).

Habitat.—In weeds from stream on Clare Island, April, 1909.

Family TUBIFICIDAE.

Clitellio arenarius (Müller).

Habitat.—Achill Sound, near high-water mark. Common under stones between tide-marks in Blacksod Bay.

¹ SOUTHERN, R.: "Contributions towards a Monograph of the British and Irish Oligochaeta." Proc. Roy. Irish Academy, vol. xxvii, 1909, p. 119.

² STEPHENSON, J.: Records of the Indian Museum, vol. v, part iv.

Tubifex Benedeni (Udekem).

Habitat.—Clare Island, between tide-marks. Blacksod Bay, common under stones and in muddy gravel throughout the year.

Family **LUMBRICULIDAE**.**Lumbriculus variegatus** (Müller).

Habitat.—Extremely common in lakes and bog-pools on Clare Island. In drains at Achill Sound.

Family **ENCHYTRAEIDAE**.**Henlea ventriculosa** (Udekem).

Habitat.—Under stones on the shore of a slightly brackish pond on the Mullet near Blacksod.

Marionina sphagnetorum Vejdovsky.

Habitat.—In moss from Clare Island, March, 1910.
Belclare Wood.

Marionina semifusca (Claparède).

Habitat.—Blacksod Bay, common under stones between tide-marks.

Lumbricillus profugus (Eisen).

1879. *Archienchytraeus profugus*, Eisen. Svenska Ak. Handl., n. ser., vol. xv, no. 7, p. 22.

Specimens agreeing closely with the description by Eisen of *L. profugus* were found on the shore of Clare Island. The only differences were in the relative proportions of the sperm-funnel and the spermatheca, which in the Clare Island specimens were much slenderer and longer in proportion. However, Eisen's description was drawn from preserved material which would certainly be strongly contracted. The sperm-funnel is 3-6 times as long as broad, and the duct of the spermatheca is about twice as long as the ampulla. This species was recorded with some hesitation by Ferronière from the west coast of France.¹ His specimens differ from the type in many points, especially in the structure of the spermathecae and the numbers of setae in each bundle, and probably belong to another species.

Habitat.—Clare Island, in weeds from the shore.

Distribution.—Greenland (Godhavn, under weeds on the shore).

¹FERRONIERE, G.: Bull. Soc. sc. nat. Ouest, t. ix, fasc. iii, 1899, p. 267.

Lumbricillus verrucosus (Claparède).

Habitat.—Frequently found on the east shore of the Mullet, Co. Mayo. Also on the Atlantic shore of the same peninsula under rotting seaweed.

Lumbricillus Evansi Southern.

Habitat.—Clare Island, between tide-marks. Atlantic shore of the Mullet under rotting seaweed.

Enchytraeus albidus Henle.

Habitat.—Clare Island, common between tide-marks. Near high-water mark, Achill Sound. Large numbers were present in the material from old gulls' nests on the Bills, June, 1910, this being the only terrestrial worm found on the Bills, which are small storm-swept rocks about 9 miles north-west of Clare Island. Atlantic shores of the Mullet, under rotting seaweed.

Enchytraeus Bucholzii Vejdovsky.

Habitat.—Under stones on the shore of a slightly brackish pond on the Mullet.

Enchytraeus cliarensis sp. n.

A few specimens of this species were found in weeds from rock-pools on Clare Island, in April, 1909. Unfortunately the description drawn up from these specimens was very short, as I fully expected to obtain more material, which, however, was not forthcoming. The description is sufficiently full to diagnose the species definitely. The worms are 4 mm. long, and the body consists of twenty-eight segments. The epidermis bears transverse rows of small granular glands. The clitellum was only faintly indicated by inconspicuous glands; but this character may be due to comparative immaturity. The brain is concave in front, and its sides diverge to the posterior margin, which may be rounded or indented.

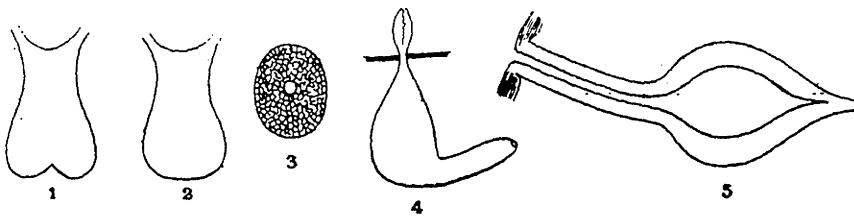


FIG. 1.

Fig. 1, 1, 2, were drawn at different times from the same specimen: and the

shape of the posterior margin evidently depends on the amount of tension exerted by the muscles which attach it to the body-wall.

The coelomic corpuscles (fig. 1, 3) are large circular thin discs, nucleated and granular. The intestine is covered with yellow cells. No salivary glands are present.

The dorsal vessel rises in the thirteenth segment, and is normally formed. The blood is colourless.

The nephridia (fig. 1, 4) have an anteseptal portion formed by the rather large funnel, which is constricted at the septum. The duct is broad, and rises from the posterior end of the post-septal portion, and is equal to the latter in length. The anterior part of the post-septal is of a deep yellow colour.

The sperm-funnel is long and slender, about six times as long as broad, and the sperm-duct is short.

The spermatheca (fig. 1, 5) consists of an almost globular ampulla attached to the oesophagus, and an equally long, slender duct which is free from glands.

This species is distinguished from *E. albidus* by its smaller size, quite different appearance, by the absence of salivary glands, etc. It appears to have the greatest affinities with *E. litteratus* Hesse,¹ found on the shore at Naples. Unfortunately Hesse gives no information as to the number of setae in each bundle. The two species agree in the structure of the corpuscles, absence of salivary glands, and origin of the dorsal vessel, but differ in the shape and proportions of the nephridia, sperm-funnel and spermatheca, whilst the dorsal vessel, which is normal in the present species, in *E. litteratus* divides into two branches some distance before the anterior end.

Habitat.—In weeds from rock-pools, Clare Island, May, 1909.

***Enchytraeus* sp.**

It is generally advisable to ignore immature specimens belonging to the family Enchytraeidae, but the habitat of the present species warrants a note on its occurrence.

It was found in the roots of *Laminaria* dredged in 9–11 fathoms east of Clare Island.

The specimen was 2 mm. long, and consisted of sixteen segments.

There are two setae in each bundle, except in the last, which has three dorsally and ventrally. The setae show a slight double curvature and are distinctly larger in the posterior segments, especially in the last segment. There are three pairs of septal glands, one pair in the fifth segment, and

¹ 1893. *Parenchytraeus litteratus*, Hesse. Zeit. f. wissen. Zoologie, vol. lvii, p. 2.

apparently two pairs in the sixth segment. The specimen is probably quite young, and the adult will differ considerably.

Habitat.—Clew Bay. Dredged in 9-11 fathoms.

***Grania maricola* gen. et sp. nov.**

(PLATE I.)

Two immature specimens of a remarkable Oligochaete were found on a bottom of sand and shells in 24 fathoms in Clew Bay, together with a rich and peculiar micro-fauna, consisting of an association of species, many of them new to science or very rare, not found elsewhere in the district. A very small specimen, probably belonging to the same species, was also found in the sand of a *Zostera* bed between tide-marks in Blacksod Bay. Some time afterwards, when dredging in Dingle Bay, a number of mature specimens were found in two different localities on a bottom of fine gravel, associated with the same fauna. The peculiar nature of this fauna will be dealt with in another place (Part 67 of this series).

One specimen was examined alive and roughly sketched; but the greater part of the description has been drawn up from material stained and mounted in canada balsam.

Longitudinal sections were also made, but, owing to the slenderness of the worm and to imperfect fixation, they did not yield much information.

The worms are long and slender, and resemble Nematodes in appearance. Mature individuals are from 14-20 mm. in length, and consist of 62-64 segments. The diameter of the body is .21-.28 mm.

No head-pore could be seen, and dorsal pores are absent. The epidermis is marked by numerous fine transverse rings, between which are rows of small, flat, irregular glands. These are specially noticeable in the anterior region of the body. The prostomium and buccal segment especially are covered with small, irregular glands. Behind the spermathecal segment these glands are inconspicuous.

The prostomium is rounded, and the mouth forms a broad transverse slit on the ventral surface. The anus is situated on the ventral surface of the anal segment, and, like the buccal cavity, is richly ciliated.

The clitellum stretches from the middle of the eleventh to the middle of the thirteenth segment. It is rather inconspicuous, and is formed by a regular mosaic of square cells.

The most remarkable feature of this species is the arrangement of the setae. From the anterior region of the body they are quite absent. On the segment behind that containing the spermathecae (fig. 1) the first pair of

setae appear, representing the ventral bundles. This segment is probably the sixth. About eighteen segments are thus furnished each with a single pair of ventral setae, which are, however, quite absent from the segment bearing the male pores (the twelfth). On the twenty-fourth segment an additional pair, representing the dorsal bundles, appears, and thus four setae occur in the posterior forty segments. The setae are very large and thick, .14 mm. in length. The inner end is wide and funnel-shaped, and the distal end tapers to a bluntly rounded point. The muscular bands controlling the setae are large and conspicuous, and almost stretch across the body-cavity (fig. 5). In the posterior region where four setae occur in each segment, the pair on each side cross (fig. 6). Only the point of the setae projects beyond the epidermis.

But in addition to the normally formed functional setae, almost every specimen shows large numbers of setae of various sizes scattered about in the body-wall (fig. 4). These setae usually occur in parallel bunches, but may be scattered about quite irregularly. They lie in the inner layer of the body-wall parallel to the surface, and do not pierce the epidermis. In shape they resemble the functional setae. The occurrence of this phenomenon in a species where the functional setae are so exceptional is of great interest. In the Chaetopoda each seta is normally formed by a single epidermal cell occurring in an epidermal invagination which forms the seta sac. In order to explain the observed phenomena it is therefore necessary to suppose that the seta-producing tissue has undergone a process of proliferation and spread from the region of the normal setae over the inner surface of the body-wall. This tissue appears to be in a state of unstable equilibrium in this species.

The brain (figs. 1, 3, 7) is concave in front, deeply indented behind, and the sides diverge from the narrow anterior end to the broad posterior region. It is attached to the body-wall by two broad muscular bands. The nerve commissures give off in front two branches on each side, which pass to the walls of the prostomium and buccal segment. The anterior end of the nerve cord is thick and broad, with irregular outline; but behind the 4th segment it is uniform in thickness, without ganglionic swellings. No copulatory glands could be seen. Sections of the brain (fig. 7) show in the peripheral tissue large deeply staining nuclei, and similar nuclei are present in the ventral part of the nerve-cord.

The blood is pale-yellow in colour. The dorsal vessel was traced backwards in preserved specimens to the back of the 15th or 16th segment, where it emerges from the intestinal plexus. It runs to the front of the brain (fig. 2), where it divides into two branches. These pass backwards on the ventral side, and join at the posterior end of the 4th segment. Three pairs of com-

missural vessels join the dorsal to the ventral vessels. The anterior pair run for some distance forward, the second pair pass directly to the ventral commissures, and the third pair join the ventral vessel just behind the junction of the ventral commissures. No trace of a cardiac body ("hertzkörper") could be seen in the dorsal vessel.

The corpuscles are large oval or round flat granular discs.

The cavity of the prostomium is cut off from the body-cavity by a delicate septum (fig. 3).

The pharynx lies in the dorsal part of the buccal cavity (figs. 1, 7). Its walls are very thick and muscular, and it is controlled by powerful muscles attached to the dorsal body-wall. The oesophagus is wide at its anterior end, and again near the septum dividing the 5th and 6th segments.

A pair of long thick unbranched salivary glands are attached to the anterior end of the oesophagus (fig. 1).

The septal glands vary considerably in size and position in different individuals and at different stages of maturity. In the sexually mature specimens (fig. 1) there is a small dorsal pair on the posterior margin of the 4th segment. In the 5th segment there are two pairs attached respectively to the anterior and posterior septa. In the 6th segment there is a large pair occupying the whole lateral region of the segment, and attached at the anterior end.

The nephridia are long and slender, with no distinct duct (fig. 8). They were only seen in preserved specimens, and probably the figure does not represent their appearance in life. The first pair of nephridia are in the 7th and 8th segments.

The spermathecae (figs. 2, 10) are very large. Each consists of a globular ampulla, from the outer margin of which rises a sharply defined muscular duct, without glands. The duct opens to the exterior at the dorso-lateral region of the anterior part of the segment, and not in the intersegmental area, as is usual in the Enchytraeidae. In optical section (fig. 2) it is seen that the spermathecae communicate with the oesophagus, which is slightly widened at this point. In the surface view (fig. 10) the posterior part of the spermathecae and the adjacent part of the oesophagus are covered with large glandular cells.

The sperm-funnels are very long and slender (fig. 9), and pass gradually into the ducts, which are long and convoluted, running backwards to the 14th segment, where they are thrown into a spiral coil. The penial bulb, if present, is very small and inconspicuous.

Mature specimens were found in August and November.

Owing to the absence of setae in the anterior part of the body, the

systematic position of this species is rather uncertain, as the segments on which the genital pores open to the exterior cannot be definitely ascertained. I have very little doubt, however, that it belongs to the family Enchytraeidae. The first septum is in front of the segment containing the spermathecae. If this region is assumed by analogy to consist of 4 segments, then the segment containing the spermathecae is the 5th. Then follow six segments with setae, after which comes the segment with the male pores. If the first presumption is correct, the arrangement of the reproductive organs agrees exactly with that found in the Enchytraeidae. Again, the structure and position of the vascular system, nervous system, septal and salivary glands, agree very closely with those found in the Enchytraeidae.

Michaelsen¹ has described an Enchytraeid which he calls *Enchytraeus monochaetus*, found on the shore of South Georgia, an island in the South Pacific. It agrees with the present species in the arrangement of the setae, and, whilst differing considerably in detail, seems undoubtedly to be closely related to *Grania maricola*. Setae are absent from the anterior 4 or 5 segments. Then follow a number of segments with only a ventral pair, afterwards joined by a dorsal pair. The setae on the anterior segments are small and thin; those behind increase in size. They are sharply pointed, almost straight, and with a short bend on the inner end. In shape these setae differ considerably from those of *Grania maricola*, and resemble more the usual type found in the genus *Enchytraeus*. Salivary glands are absent, a dorsal head-pore is present, and the spermathecae differ greatly from those of *Grania maricola*. As regards the structure of the nephridia, septal glands, origin of the dorsal vessel, etc., there is a general agreement between the two species.

The peculiar arrangement of the setae is alone sufficiently remarkable to warrant the separation of these two species from the genus *Enchytraeus*, and the creation of a new genus.

The occurrence of these two remarkable but evidently closely allied forms, in two such widely distant localities, is of great interest, and probably indicates the great age of the generic type. The resemblance in the arrangement of the setae is too striking to be explained on the theory of convergence or parallel development.

The new genus may be defined as follows:—

Grania² gen. nov.

Setae straight and thick, wide at the inner end, absent from the anterior region, a single ventral pair in the middle region, joined in the posterior region by a

¹ MICHAELSEN, W.: Die Oligochaeten von Süd-Georgien. Jahrbuch der Hamburg. wissenschaft. Anstalten, V, 1888.

² Named after the famous chieftainess of Clare Island in the sixteenth century.

dorsal pair. Dorsal pores absent. Dorsal vessel rising behind the clitellum. Cardiac body absent. Spermathecae communicating with the oesophagus. Pharynx dorsal. Habitat marine.

In the arrangement of the setae this genus is quite distinct from any other genus of the Enchytraeidae. In other respects, such as the structure of the salivary glands, septal glands, spermathecae, etc., it appears to have greater affinities with the genus *Enchytraeus* than with any other. This is the first Oligochaete which has been found below low-water mark; hence the specific name "*maricola*."

Habitat.—Clew Bay. Dredged on a bottom of sand and shells in 24 fathoms, south-west of Clare Island.

Blacksod Bay. One specimen in sand of a *Zostera* bed on the south shore of Elly Bay.

Also dredged on two occasions in 19–20 fathoms on a bottom of fine gravel and sand, in Dingle Bay.

Fridericia bulbosa (Rosa).

Habitat.—In soil from Clare Island, May, 1909.

Fridericia bisetosa (Levinsen).

This species has recently been recorded from Ireland by Friend,¹ who found it in soil from Poyntzpass.

The Clare Island specimens agree closely with previous descriptions, except that the dorsal vessel rises in the 22nd segment, and not the 18th. This character is subject to considerable variation.

Habitat.—Clare Island, in soil.

Fridericia minuta Bretscher.

Habitat.—In moss from Clare Island, August, 1911.

Achaeta bohemica (Vejd.).

Habitat.—In soil from Clare Island, May, 1909.

Achaeta Cameranoi Cognetti.

1899. *Anachaeta Cameranoi*, Cognetti. Boll. Mus. Torino, vol. xiv, nr. 354, p. 2.

This species has not previously been found in Ireland. Friend has recently found it in England.² The specimens from Clare Island differ in certain features from those described by Cognetti. The salivary glands are

¹ Friend, Rev. H. *Irish Naturalist*, vol. xxi, 1912, p. 172.

² Friend, Rev. H. *Naturalist*, 1911, p. 413.

fairly long, stretching dorsally from the pharynx to the 7th segment, and swelling to a bulb behind. The sperm-duct is coiled in a spiral, and is many times longer than the sperm-funnel. In other respects there is a general agreement; and these differences hardly warrant the creation of a new species at present.

Habitat.—Clare Island, in soil, May, 1909.

Distribution.—England; Italy.

Family Lumbricidae.

Eiseniella tetraedra (Sav.) typicus.

Habitat.—Clare Island, in weeds from stream, and in damp soil. Achill Sound, near quay. Louisburgh.

Eisenia rosea (Sav.):

Habitat.—Clare Island, in soil.

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

Habitat.—Achill Sound, near quay. Clare Island, in soil

Helodrilus (*Allolobophora*) *chloroticus* (Sav.).

Habitat.—Clare Island, in soil. Achill Sound. Louisburgh.

Helodrilus (*Allolobophora*?) *relictus* Southern.

This remarkable species, which was described (Southern, *loc. cit.*) from a single specimen found on Clare Island, has unfortunately not been again found in the course of the Survey. During my visit to the island in May, 1909, the ground was very dry, owing to the prolonged drought, and earthworms were practically impossible to obtain, except in the gardens near the village.

Helodrilus (*Dendrobaena*) *mammalis* (Sav.).

Habitat.—Clare Island, in soil. Achill Sound, near quay.

Helodrilus (*D.*) *rubidus* var. *subrubicunda* (Eisen).

Habitat.—Clare Island. Achill Sound. Louisburgh.

Helodrilus (*D.*) *octaedrus* (Sav.).

Three specimens from the summit of Croaghpatrick had the clitellum on segments 29–33½–34. Normally, Irish specimens have it on segments 29–33.

Habitat.—Clare Island, in soil, and on the summit of Croaghmore (1520 feet). Summit of Croaghpatrick (2510 feet).

Helodrilus (Bimastus) Eiseni (Levinsen).

Habitat.—Glendarary Wood, Achill Island. Between Roonagh and Louisburgh.

Octolasion lacteum (Orley).

Habitat.—Clare Island, in soil.

Lumbricus rubellus (Hoffm.).

Habitat.—Clare Island, common in soil; also on the summit of Croaghmore (1520 feet). Glendarary, Achill Sound, Louisburgh.

Lumbricus castaneus (Sav.).

Habitat.—Clare Island, in soil. Achill Sound.

Lumbricus terrestris L.

Habitat.—Clare Island, in soil.

Lumbricus festivus (Sav.).

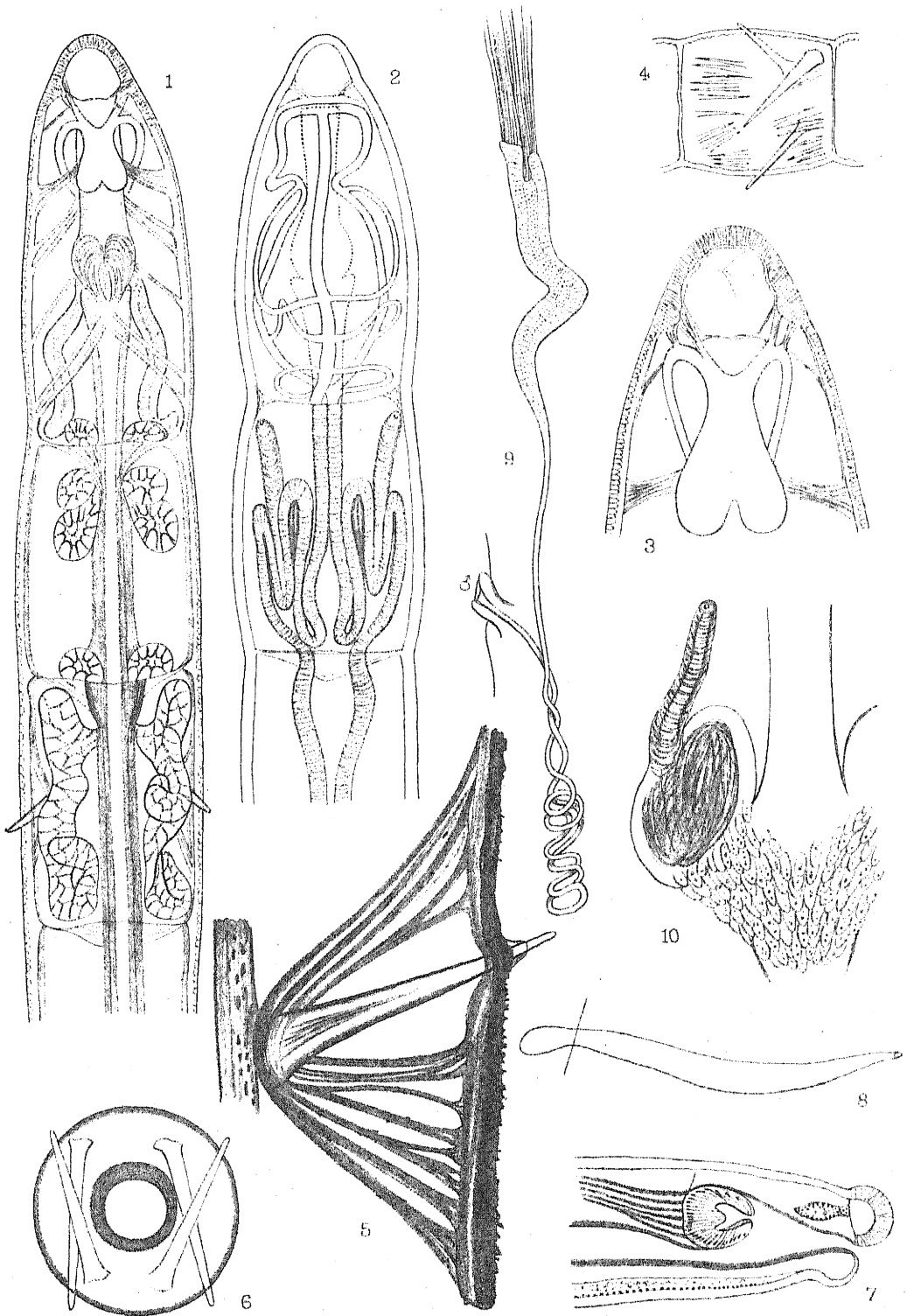
Habitat.—Clare Island, in soil. Achill Sound.

DESCRIPTION OF PLATE I.

GRANIA MARICOLA, GEN. ET SP. NOV.

FIG.

1. Anterior end, dorsal view, showing alimentary canal, septal and salivary glands, etc. $\times 100$.
2. Anterior end, dorsal view. Vascular system shown in front, spermathecae and oesophagus in optical section behind. $\times 100$.
3. Anterior end, showing brain.
4. Lateral view of a posterior segment, showing normal and abnormal setae.
5. Longitudinal section, showing seta and controlling muscles.
6. Diagram of transverse section of a posterior segment, showing arrangement of setae.
7. Longitudinal section of anterior end, showing structure of pharynx.
8. Nephridium, from preserved specimen.
9. Sperm-funnel and duct.
10. Spermatheca in surface view.



West, Newman lith.

Grania maricola gen. et sp. nov.

CLARE ISLAND SURVEY - SOUTHERN: OLIGOCHAETA