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SOME EAST SUSSEX OLIGOCHÆTS.

By the Rev. Hilderic Friend, F.R.M.S.

While treating of the distribution of British Annelids (1) * in this Journal, I gave in April, 1913 (vol. xvii., ser. 4, pp. 151–2), a list of the *Lumbricidæ* of Sussex. In the same volume I also described some new species of *Henlea* (pp. 81–91), while in other articles in the 'Zoologist' and the 'Journal of the Royal Microscopical Society' I had added still further to our knowledge of the subject. Up till the present, however, no attempt has been made to bring under review our knowledge of the entire order of Oligochæts. As I have, so far as I am aware, been the only naturalist to study the subject, the following records are entirely based on my own observations in the county.

It will be necessary, for the sake of completeness, to recapitulate some of my earlier statements (7). My researches commenced in November, 1890, and were continued in March, 1892 (2). The *Lumbricidæ* collected on these occasions numbered fifteen species. In addition, a number of *Tubificidæ* and *Enchytræidæ* were examined, but many of these have not as yet been reported on.

In 1897 I compiled a list of Sussex Earthworms (3) so far as then known, and enumerated sixteen species; *Octolasium profugum* being the latest addition to the county records. For many years, owing to my residence at a distance and my other researches, no further progress was made, but in 1911 *Helodrilus*

* The numbers in brackets refer to the Bibliography.

oculatus was discovered. In December of that year I had to visit Hastings, and was fortunate enough to discover many interesting things. The number was increased during a stay of some days in Sussex in July, 1912, while a visit to Sedlescombe in August, 1913, enabled me to make yet other discoveries. Practically all of those which were new to science have already been described in this or other journals; but there are a few species which are at present unknown in any other part of the kingdom, to which attention must be drawn before a list of all known species is drawn up. Hastings itself has proved to be peculiarly rich in Enchytræids and Tubificids; but, owing to the paucity of lakes, ponds, and streams, there seem to be very few *Naididæ* or allied forms, though these abound around London.

Of the Henleas which I described in this Journal (1913, pp. 81–91) a considerable number have been found in Sussex, and in several instances the descriptions were based upon material collected at Hastings in December, 1911. My most successful hunting-ground on that occasion was a bit of waste land between the sea and the Bexhill road near the Bopeep Station. One or two bridges are found here under which the streamlets flow into the sea, and it was found that Enchytræids delighted in the moist, cool situations provided by the wall on the one side and the earth, frequently enriched by decaying seaweed and other vegetable matter, on the other. Here I found many specimens of *Henlea marina*, *H. curiosa*, *H. arenicola*, *H. heterotropa*, and others new to science.

Alexandra Park also proved to be a very valuable hunting-ground. The decaying leaf-mould usually harbours a number of interesting Lumbricids, such forms as *Dendrobæna subrubicunda*, *D. arborea*, *Eisenia fœtida*, *Lumbricus rubellus*, and *L. castaneus* being the most frequent. In a manure-heap I found, in addition to many Brandlings and *Enchytræus albidus*, a form of *Eisenia* which is uncommon. Unfortunately the material in this case was immature, and I have not hitherto been able to obtain a fresh supply for its determination. The matter is, however, worthy of mention, as showing that the possibilities of further discoveries are not yet exhausted.

The mud on the margin of the pool in the park proved to be

very rich in material, and both here and in the runnels which lead to it I have found material which has not up till the present occurred in any other locality. One or two of the species merit special notice.

Ilyodrilus meganymphus, Friend (1912, J. R. M. S., p. 289); the locality unfortunately not then recorded), belongs to the Tubificids. Its specific name is due to the large spherical cœlomic corpuscles (nymphus = lymphus, whence our term lymphatic). In this respect the creature resembles *Rhyacodrilus*, which is a link between the *Tubificidæ* and the *Naididæ* (4). The chloragogen cells begin in segment 4, which is in advance of the usual position. Curiously enough, while it simulates *Rhyacodrilus* in the matter of cœlomic corpuscles, it closely resembles the red-blooded Enchytræids in the vascular system. This is of peculiar interest, seeing that the blood-vessels in the *Tubificidæ* are usually much more profuse and the system much more complex than is the case with the Enchytræids. It is the discovery of such unusual forms as these which at once makes systematic lists and definitions a problem, and yet throws such a flood of light on the evolution of species.

Haplotaxis gordioides (G. L. H.). In 1896 I gave an account (5) of a worm which had been sent to me by a medical man in Essex. It was new to science, and was named *Dichæta curvisetosa*, Friend. The name was changed in 1899 to *Phreoryctes dichætus*, Friend. Up till the present no further specimens have been found. Michaelsen (10) in 1899 published an account of *P. gordioides*, and included the Essex species, in spite of the great differences between it and the type. In 1900 (9) he issued his valuable monograph on Oligochæts, and called the worm *Haplotaxis gordioides*, and still persisted in including the Essex form. On December 21st, 1911, I had the good fortune to find the worm which bears this name in Alexandra Park, Hastings, and was able instantly to recognize it and to see how greatly it differs from *P. dichætus*. Thus, at the present time we have two species of *Haplotaxidæ* in England; in addition to a third well worm found in East Anglia but not yet described.

Tubifex heuscheri, Bret., was also collected near the park. It has not been found elsewhere in Great Britain up till the present time; making the third unique species.

It should be noted that my observations are limited to a triangle, the base of which extends from Hastings to Pevensey, and the two sides joining those places with Robertsbridge.

On the occasion of my last visit to Sussex in August, 1913, I spent an hour in examining the Annelid fauna under moss and liverwort by a bridge over the little stream which flows through the meadows or "brooks," as they are locally called in the picturesque village of Sedlescombe, and here I found some species of Enchytræids which had not previously been recorded for Sussex. It may be of interest to note that one of these was *Chamædrilus chlorophilus*, Friend (6). Though first described from material collected in Derbyshire, I found, on looking up my notes, that I had already found it in Sussex, but had not been able to identify it, and so had put my description aside to await fuller light. Thus it happens that Sussex has the honour of giving us one of the first reliable records for this hitherto unknown Annelid.

These preliminary observations must suffice to prepare the way for the systematic list. The families and genera are for convenience of reference arranged in the order adopted by Prof. Michaelsen (9). Unfortunately there has, up till the present, been no reliable record for either the family *Æolosomatidæ* or *Naididæ*. These contain many species of microscopic worms which inhabit the mud or vegetation of fresh or brackish waters. We begin, therefore, with the *Tubificidæ*, another family of freshwater worms, but of larger dimensions.

Tubificidæ.

Setæ of various kinds; male pore on eleventh or twelfth segment, with spermathecal pore on adjoining segment. Upwards of a dozen known genera. Michaelsen (9), pp. 36 *seq.*, 522 *seq.* The Sussex genera at present on record are limited to three, *viz.* *Limnodrilus*, *Ilyodrilus*, *Tubifex*. I believe *Sænuris*, *Clitellio*, and *Psammoryctes* might be found if carefully sought. *Rhyacodrilus* also, which I have shown (4) to be more nearly related to the *Tubificidæ* than the *Naididæ*, is found in Essex, and should occur under similar conditions in Sussex.

1. *Limnodrilus hoffmeisteri*, Clap.—Michaelsen (9), p. 43. Alexandra Park, Hastings, June, 1912. Not uncommon in the county by streams and in pools.

2. *L. udekemianus*, Clap.—Michaelsen (9), p. 45. Alexandra Park, Hastings, June, 1912, and elsewhere. First collected for certain at Amberstone Grange, August 30th, and at Battle and Sedlescombe, August 31st, 1911.

3. *L. papillosus*, Friend.—1912, Friend (6), pp. 276–7. "First found at Kew, August, 1911, and since discovered in gleanings from the neighbourhood of Battle and Hurstmonceaux, Sussex." Hastings, June 20th, 1912.

4. *L. aurantiacus*, Friend.—1911, Friend (8), p. 414. "My notes show that this species is widely distributed in the South of England, from Derbyshire to Kew and Sussex." Friend (6), p. 275.

5. *Ilyodrilus meganymphus*, Friend.—1912, Friend (6), p. 289. Described from specimens found in runnel in Alexandra Park, below the Bohemia entrance. Found December 21st, 1911.

Other species of *Ilyodrilus* occur in Sussex, but the *Tubificidæ* of Great Britain are under careful revision, and until my work is somewhat more advanced, it would only result in confusion to give further records here.

6. *Tubifex tubifex* (Müller).—Michaelsen (9), p. 48. Friend (6), pp. 291–2. *Tubifex* is common in Sussex as in most parts of England, but hitherto several different species, and even genera, have been confused under this name. I have taken different forms in Alexandra Park, at Battle, Dallington, Hurstmonceaux, and elsewhere. The same observation is true of *Tubifex* which is made of *Ilyodrilus*. I have notes made many years ago which suggest that *Psammoryctes* was at least once collected by me in Sussex. The muddy banks of rivers, as at Shoreham, would be prolific hunting-grounds, but have never yet been worked. *Heterochæta costata*, Clap., and other very interesting Annelids are sure to abound there, as they do in similar localities on the Thames estuary.

6*a*. *T. heuscheri*, Bret.—Near Kite's Nest, Hastings, June, 1912; only British record.

Lumbriculidæ.

Sigmoid setæ either forked or pointed, four pairs on each segment. Girdle in a very advanced position (segments 3–7). Ten or a dozen known genera, of which only about one half are

as yet known in Great Britain. *Rhynchelmis limosella*, Hoffm., which was found in Hants in 1913 is almost sure to occur, and one or two species of *Stylodrilus* must also be indigenous. Hitherto, however, only one genus, and but one species of that, is on record.

7. *Lumbriculus variegatus* (Müller).—Michaelsen (9), p. 58. First found by me in Pevensey Marsh in 1892. Taken in Alexandra Park, Hastings, June 20th, 1912. Not uncommon among water-weeds in streams and ponds or lakes.

Enchytræidæ.

Setæ present, except in *Achæta*, straight, sigmoid, or bent near the internal extremity. Girdle usually on segment 12; but sometimes advanced three or four segments (as in *Chamædrilus* and *Buchholzia*). Spermathecæ opening between segments 4 and 5; either free within the cœlom or more frequently attached to the intestine. Dorsal pores in one genus (*Fridericia*). Blood usually red in the Pachydrylid section, otherwise colourless or yellowish. A very large and interesting family, concerning which I have written much during the past three years, especially in the 'Journal of the Royal Microscopical Society' and in these pages (1). One new genus (*Chamædrilus*, Friend) is at present known only in Britain, where, however, it is widely distributed. To the genus *Henlea*, as well as to *Fridericia*, I have recently added many new species. So far as our present knowledge goes, England has more Enchytræids than any other country. I give the Henleas alphabetically.

8. *Henlea arenicola*, Friend.—1912 (6), p. 586. Found at Bopeep, Hastings, December 21st, 1911, and first described from the material there collected.

9. *H. curiosa*, Friend.—1912 (6), p. 588. Same locality and date as foregoing.

10. *H. fragilis*, Friend.—1912 (6), p. 588. Same locality and date.

11. *H. fridericioides*, Friend.—1912 (6), p. 587. Same locality and date.

12. *H. heterotropa*, Friend.—1912 (6), p. 589. Same locality and date.

13. *H. hibernica*, Southern.—1907, 'Irish Naturalist,' vol. 16,

pp. 70–1, with plate. First Sussex record, Sedlescombe "brooks," August, 1913.

14. *H. lampas*, Eisen.—Michaelsen (9), p. 70. Friend (1), 1911, p. 465; (8), p. 321; (6), p. 584. The species as emended found at Hastings, December 21st, 1911.

15. *H. marina*, Friend.—1912 (6), pp. 589–591, with illustrations. Bopeep, December 21st, 1911.

16. *H. rhætica*, Bretscher. — 1912, Friend (6), pp. 593–5. Hastings as before, and again November 25th, 1912.

17. *H. triloba*, Friend.—1912 (6), p. 596. From the Bopeep station, December 21st, 1911.

18. *Buchholzia appendiculata* (Buch.).—Michaelsen (9), p. 72. Hastings, June, 1912; Sedlescombe "brooks," August, 1913.

19. *B. focala*, Friend. — 1914, J. R. M. S. (now being published). Hastings, December 21st, 1911.

20. *B. tenuissima*, Friend. -- 1914, J. R. M. S. (see 19). Collected June 12th, 1912, Alexandra Park, Hastings.

I have recently revised and extended our records for this genus, adding some new British species; but am at present unable to decide whether or not a further species is to be added to the Sussex list. My Sedlescombe material is as instructive and interesting as it is perplexing, and must receive further study.

21. *Marionina* sp.—Not adult; Hastings, December 21st, 1911. This group of red-blooded Enchytræids is very extensive, and it is no exaggeration to say that, if the coast and estuaries of Sussex were to be carefully examined, a score of species at least could be collected. The genus, with its ally *Lumbricillus*, is under revision.

22. *Enchytræus albidus*, Henle.—The commonest species of this genus. Found everywhere in well-rotted manure. Very abundant in old manure-heap, Hastings, December 21st, 1911. See Friend (3) for earlier record.

23. *E. buchholzi*, Vejd. Sedlescombe, 1897. See last note.

24. *E. minimus*, Bret.—Michaelsen (9), p. 92. Hastings, December 21st, 1911.

25. *E. nigrinus*, Bret.—Hastings, December 21st, 1911. This is one of several species which have been discovered since Michaelsen's Monograph (9) was published. Other species await determination.

26. *Fridericia michaelseni*, Bret.—Michaelsen (9), p. 100. One of the most widely distributed species of this genus. Hastings, December 21st, 1911.

27. *F. bulbosa*, Rosa, and a variety or allied form at the same place and time. Also Sedlescombe, August, 1913.

28. *F. variata*, Bret. Hastings, same time and place as foregoing.

29. *Fridericia* sp.—One of the bisetose forms, not yet sufficiently diagnosed. Sedlescombe "brooks," August 16th, 1913.

This list of species belonging to the genus *Fridericia* leaves much to be desired. Nearly one hundred species are known to science, about half of which are British, and forty or fifty species ought easily to be found in Sussex. The genus *Achæta* is at present unknown in this county.

30. *Chamædrilus chlorophilus*, Friend. —1912, Friend (6), pp. 257 *seq.* This interesting Annelid appears at present to be unknown outside the British Isles. Hastings, June, 1912; Sedlescombe "brooks," August 16th, 1913.

Haplotaxidæ.

31. *Haplotaxis gordioides* (G. L. H.).—Michaelsen (9), p. 108. Quite distinct from *H.* (*Dichæta*) *curvisetosa*, Friend ('Essex Nat.' vol. 9, p. 110), with which Michaelsen confuses it. I found the genuine *H. gordioides* at Hastings, December 21st, 1911; a day memorable for the many discoveries made during a couple of hours spent between Bopeep and Alexandra Park.

Lumbriculidæ.

32. *Allurus* (*Eiseniella*) *tetrædrus*, Sav. — Michaelsen (9), p. 471. Not known in November, 1890. Friend (7), p. 22. First record for Sussex, 1892. Friend (2), p. 123. Since found in many parts of the county.

33. *Eisenia fœtida*, Sav.—Michaelsen (9), p. 475. First Sussex record, 1891. Friend (7), p. 21. Found everywhere in manure. In the Gensing Gardens I once found a variety which was peculiar, but I cannot at present put hands on my memoranda.

34. *E. rosea*, Sav. (=*A. mucosa*, Eisen). First Sussex record, March, 1892. Friend (2), p. 124. In May, 1892, my mother

collected for me at Dallington, the consignment consisting of seven species (*Allurus tetrædrus*, *Eisenia rosea*, *A. chlorotica*, *A. caliginosa*, *B. constrictus*, *L. rubellus*, and *L. castaneus*), the specimens of *E. rosea* being marked, "very typical."

35. *Allolobophora longa*, Ude. Friend (2), p. 123. First found at Dallington, March, 1892, and frequently since. More abundant in many places than the true Earthworm, with which it is often confused.

36. *A. caliginosa*, Sav. (forma *turgida*, Eisen). Friend (2), p. 124. Forma *trapezoides*, Hurstmonceaux, July 23rd, 1889.

37. *Aporrectodea chlorotica*, Sav.—With many aliases, some of which accompany the first record for Sussex, November, 1890. Friend (7), p. 21. Very common and widely distributed. Inside Pevensey Castle.

38. *Dendrobæna subrubicunda*, Eisen (= *rubida*, Sav.).—Friend (2), pp. 123–4. Very abundant, as a rule, in old manure and among leaf-mould. Alexandra Park, December 21st, 1911.

39. *D. arborea*, Eisen.—First found in Sussex, March, 1892. Friend (2), p. 123. Not common, but found again December 21st, 1911, in an old log on the shore at Bopeep.

40. *D. mammalis*, Sav. (=*celtica*, Rosa).—In tree-stump with the last at Dallington, March, 1892. Friend (2), p. 124. Rare; but found most frequently in road-scrapings which have "ripened."

41. *Helodrilus oculatus*, Hoffm.—A worm of peculiar interest. By the side of dykes at Boreham Bridge, by the Fish Market, Hastings, and on the way to Kite's Nest Farm; apparently generally distributed in Sussex.

42. *Bimastus eiseni*, Lev.—Apparently rare in Sussex. First record, March, 1892. Friend (2), pp. 123–4.

43. *B. constrictus*, Rosa.—The Sussex record for March, 1892 (Friend (2), p. 123), was the first for Great Britain. June, 1912, I found one specimen in a gutter beyond the Fish Market, Hastings, with *H. oculatus*, *L. rubellus*, and *A. chlorotica*.

44. *Octolasium profugum* (= *lacteum*, Oerley).—*Supra*, p. 81. Dallington; first and only Sussex record.

45. *Lumbricus rubellus*, Hoffm.—Friend (2), p. 123. Generally distributed.

46. *L. castaneus*, Sav. (= *purpureus*).—March, 1892. Friend (2), p. 123. First record, November, 1890. Friend (7), p. 21.

47. *L. festivus*, Sav. (= *rubescens*, Friend).—Near fir plantation between Brightling and Dallington, March, 1892. (2), p. 123. Not common in Sussex.

48. *L. terrestris*, L.—Friend (7), p. 20. Dallington, Hurstmonceaux, and elsewhere.

In addition to the foregoing, I have to record the occurrence of a small tender worm at Ecclesbourne. It was found in July, 1912, but died before I could examine it alive. A second collection was made and preserved. No single example was adult, but it seemed undoubtedly to belong to the genus *Allurus*. Pending an opportunity of seeking for it again, I have named it *Allurus mollis*.

When we remember that a county like Nottingham, without a seaboard or estuary, and with hardly any hills, already records nearly a hundred Annelids, we cannot repress the suspicion that many new species await discovery in Sussex; and if two hours' work could in December, 1911, yield such rich results, what might we not expect if a steady and systematic search were carried out? I shall be glad of any assistance in this most important branch of research. Gleaning should be placed in tin boxes and addressed Pocklington, York.

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