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REPORT ON THE TOWNETTINGS:
FAUNISTIC NOTES.

BY

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REPORT ON THE TOW-NETTINGS.

By ANDREW SCOTT.

During the year 1905 three hundred and sixty-five tow-nettings have been examined. These collections were made in various parts of the Irish Sea, extending from Luce Bay in the North to Fishguard Bay in the South. Of this number, two hundred and ninety-seven were taken by the steamer, forty-one by the Welsh officers at Carnarvon, Pwllheli and New Quay, and twenty-seven by Mr. Chadwick at Port Erin. A continuous series from any particular area can scarcely be expected under the present system. The primary work of the steamer is to patrol the whole coast line of Lancashire and Wales, from Haverigg Point to Kemmaes Head, and occasionally visit the Isle of Man and Milford Haven Districts. The Fishery Officers have their particular sections to supervise, and Mr. Chadwick has many duties to perform. The tow-nettings can, therefore, only be taken when time permits, or in conjunction with other work such as collecting trawling statistics, and are liable to be interrupted through pressure of work or stress of weather. At some future period a more regular system of collecting may be attained by the provision of a special scientific steamer. Meanwhile we make the most of the material we get, and are very grateful for the opportunities afforded us. The information derived from these tow-nettings is gradually extending our knowledge of the periodic occurrence and distribution of the pelagic organisms in our area.

It is proposed in this report to deal specially with the result of the examination of the collections from Cardigan Bay, as it is the only area from which we have a series representing every month in the year.

The collections from other areas such as Blackpool, North Wales, and Port Erin have been interrupted from the causes already mentioned, but the information gained from these, as to distribution, &c., will be given where it appears useful. A report on the distribution of the organisms from year to year may be given at a future date, and will contain further details. The report given last year was only intended as a record of the monthly occurrences of groups of organisms without mentioning the genera and species, and was primarily prepared for use in the fishermen's classes.

The present report is the first, so far as we know, that deals with the organisms present each month of the year in the waters of Cardigan Bay. Sixty-six collections from this area have been examined. Of that number thirty-one were taken by the steamer in various parts of the bay, twenty-two by D. Pritchard, Fishery Officer at Pwllheli, and fourteen by E. Williams, Fishery Officer at New Quay. The following lists give the occurrence from month to month of the organisms identified in the Cardigan Bay tow-nettings.

January.

Autolytus prolifer, *Sagitta bipunctata*, "Mitraria," *Meganyetiphanes norvegica*, *Calanus helgolandicus*, *Pseudocalanus elongatus*, *Paracalanus parvus*, *Centropages hamatus*, *Anomalocera patersoni*, *Acartia clausi*, *Oithona similis*, Fish eggs (Plaice).

February.

Biddulphia, *Coscinodiscus*, Medusoid gonophores, *Autolytus prolifer*, *Sagitta bipunctata*, "Mitraria," "Mysis stage" of *Crangon*, *Calanus helgolandicus*, *Pseudocalanus elongatus*, *Paracalanus parvus*, *Centropages hamatus*, *Temora longicornis*, *Anomalocera*

patersoni, *Acartia clausi* and *A. discaudata*, *Oithona similis*, *Cyclopina littoralis*, *Canuella perplexa*, *Euterpina acutifrons*, *Alteutha interrupta*, Copepod nauplii, Nauplii of Barnacles, *Oikopleura*, Fish eggs (Plaice, Dab, Flounder, Haddock, Coal Fish, Bib, Rockling).

March.

Biddulphia, *Coscinodiscus*, *Pleurobrachia pileus*, *Autolytus prolifer*, *Sagitta bipunctata*, "Mitraria," *Pseudocalanus elongatus*, *Paracalanus parvus*, *Centropages hamatus*, *Temora longicornis*, *Acartia clausi* and *A. discaudata*, *Oithona similis*, *Cyclopina littoralis*, Copepod nauplii, Nauplii and Ostracod stages of Barnacle, Ascidian eggs, Fish eggs (Plaice, Flounder, Dab, Cod, Rockling).

April.

Biddulphia, *Coscinodiscus*, *Pleurobrachia pileus*, *Sagitta bipunctata*, "Mitraria," Crab zoea, "Mysis stage" of Crangon, *Paracalanus parvus*, *Centropages hamatus* and *C. typicus*, *Temora longicornis*, *Acartia clausi*, and *A. discaudata*, Copepod nauplii, Nauplii of Barnacles, Ostracod stage of Barnacles, Ascidian eggs, *Oikopleura*, Fish eggs (Plaice, Brill, Coal Fish, Sprat, Rockling, Common Dragonet). Post larval pleuronectids.

May.

Coscinodiscus, *Pluteus* larvæ of Starfish, *Pleurobrachia pileus*, Medusoid gonophores, *Sagitta bipunctata*, larval Polychæta, "Mitraria," "Mysis stage" of Crangon, Crab zoea, *Calanus helgolandicus*, *Pseudocalanus elongatus*, *Paracalanus parvus*, *Centropages hamatus*, and *C. typicus*, *Temora longicornis*, *Acartia clausi* and *A. discaudata*, *Oithona similis*, Copepod nauplii, Nauplii and Ostracod stages of Barnacles, Podon

intermedium, Ascidian eggs, Oikopleura, Fish eggs (Brill, Solenette, Sprat, Rockling). Post larval pleuronectids and gadoids, young rockling.

June.

Biddulphia, Rhizosolenia, Gelatinous algæ, Pluteus of Echinus, Pluteus of brittle starfish, Pleurobrachia pileus, Medusoid gonophores, young Aurelia, Sagitta bipunctata, larval Polychæta, "Mitraria," "Mysis stage" of Crangon, Zoea and Megalopa of Crabs, Idotea marina, Paracalanus parvus, Centropages hamatus and *C. typicus*, Temora longicornis, Acartia clausi, and *A. discaudata*, Copepod nauplii, Podon intermedium, Oikopleura, Fish eggs (Brill, Turbot, Solenette, Weever), one young Sole 7.5 mm. long, young Rockling.

July.

Rhizosolenia, Ceratium tripos, *C. fusus*, and *C. furca*, Pleurobrachia pileus, Medusoid gonophores, young Aurelia, Sagitta bipunctata, "Mitraria," "Mysis stage" of Crangon, Zoea and Megalopa of Crabs, Trachelifer stage of Jaxea nocturna, Erichtheus stage of Squilla, Pelagic stage of common lobster, Paracalanus parvus, Centropages hamatus, and *C. typicus*, Temora longicornis, Isias clavipes, Anomalocera patersoni, Labidocera wollastoni, Pontella lobiancoi, Acartia clausi, and *A. discaudata*, Oithona similis, Canuella perplexa, Monstrilla anglica, Podon intermedium and *P. leuckartii*, Evadne nordmanni, Oikopleura, Fish eggs (Weever), young Weevers, young Rocklings, young Garfish.

August.

Noctiluca, Sagitta bipunctata, Autolytus prolifer, "Mitraria," "Mysis stage" of Crangon, Zoea and

Megalopa of Crabs, Trachelifer stage of *Jaxea nocturna*, *Erichtheus* stage of *squilla*, *Paracalanus parvus*, *Centropages hamatus* and *C. typicus*, *Temora longicornis*, *Isias clavipes*, *Anomalocera patersoni*, *Labidocera wollastoni*, *Pontella lobiancoi*, *Acartia clausi*, and *A. discaudata*, *Oithona similis*, *Euterpina acutifrons*, *Podon intermedium* and *P. leuckartii*, *Ascidian eggs*, *Oikopleura*.

September.

Biddulphia, *Coscinodiscus*, *Chætoceros*, *Ceratum tripos*, *C. fusus* and *C. furca*, *Pleurobrachia pileus*, *Medusoid gonophores*, *Sagitta bipunctata*, larval *Polychæta*, "Mitraria," "Mysis stage" of *Crangon*, *Paracalanus parvus*, *Centropages hamatus*, *Temora longicornis*, *Acartia clausi*, *Oithona similis*, *Canuella perplexa*, *Euterpina acutifrons*, *Podon intermedium* and *P. leuckartii*, Larvæ of *Gasteropods*, Larvæ of *Lamelli-branchs*, *Oikopleura*.

October.

Chætoceros, *Bellerochea*, *Ceratum fusus*, *Pleurobrachia pileus*, *Sagitta bipunctata*, Larval *Polychæta*, *Pseudocalanus elongatus*, *Paracalanus parvus*, *Centropages hamatus*, *Temora longicornis*, *Acartia clausi*, *Oithona similis*, *Euterpina acutifrons*, *Oikopleura*.

November.

Coscinodiscus, *Noctiluca*, *Sagitta bipunctata*, *Tomopteris onisciformis*, "Mysis stage" of *Crangon*, *Megalopa* of Crabs, *Calanus helgolandicus*, *Paracalanus parvus*, *Centropages hamatus*, *Temora longicornis*, *Anomalocera patersoni*, *Acartia clausi*, *Oithona similis*, *Euterpina acutifrons*, *Oikopleura*.

December.

Biddulphia, Coseimodiscus, Ceratium fusus, and C. furca, Noctiluca, Pleurobrachia pileus, Sagitta bipunctata, Autolytus prolifer, Tomopteris onisciformis, larval Polychæta, "Mitraria," "Mysis stage" of Crangon, Meganyctiphanes norvegica, Calanus helgolandicus, Pseudocalanus elongatus, Paracalanus parvus, Centropages hamatus, Temora longicornis, Anomalocera patersoni, Acartia clausii, Oithona similis, Euterpina acutifrons, Oikopleura, Fish eggs (Plaice).

Remarks on the Occurrence and
Distribution of Organisms.

Taking the months in order, we find from collections which could only be secured during the second half of January that twelve different organisms were present, and the bulk of these were copepoda. *Pseudocalanus*, *Paracalanus*, *Centropages* and *Acartia* were the most conspicuous, only a few of the remaining three were noted. *Calanus* and the schizopod *Meganyctiphanes* were limited to bottom gatherings. *Sagitta*, though present in immense numbers at the bottom, were comparatively scarce near the surface. Observations elsewhere were rather limited in January owing to uncertainty of the weather, and only four inshore areas were dealt with, but these practically take in the coast line from Blackpool to New Quay Head. It is therefore noteworthy that though Diatoms were absent in the coastal waters, representatives of three genera occurred at Port Erin.

During January arrangements were completed for the Fishery Officers at Pwllheli and New Quay to take tow-nettings in their divisions at least once a fortnight, in addition to the collections made by the steamer when circumstances permitted. The extra gatherings were

begun in February and continued throughout the year. The tow-nettings for February comprised eight surface and five bottom samples. Copepoda, so far as number of species go, reached the maximum point in this month, when fourteen forms were noted, but only four of these (the same as in January) were at all common. *Sagitta* was again abundant near the bottom. Copepod nauplii and the nauplii of barnacles made their appearance in February. Seven species of fish eggs were noted and two species of diatoms. Five other coastal areas were examined, one off-shore station and Port Erin. Diatoms appeared to be scarce in distribution throughout the Irish Sea. Three genera were represented at Port Erin, two in Cardigan Bay and one in Fishguard Bay. Altogether thirty distinct organisms were detected in Cardigan Bay. Port Erin, with fourteen, was the next richest area.

In March owing to pressure of other work the steamer was unable to investigate Cardigan Bay, but the Fishery Officers sent in five samples, which were representative of the whole month. Twenty-three organisms were noted, including eight species of Copepoda and five species of fish eggs. The ostracod stage of barnacles and the eggs of species of Ascidians appeared for the first time in 1905 in this month. Five coastal areas were investigated, also four stations in the central portion of the Irish Sea, but Port Erin was not represented. Diatoms were apparently present throughout the whole of the Irish Sea in March, and were represented by the genera *Biddulphia* and *Coscinodiscus*.

The steamer was again engaged in other work in April, and the collections sent by the Fishery Officers contained the only material available. These were taken on the 12th, 18th (two tow-nettings) and 29th. The organisms numbered twenty-five, and included six

species of Copepoda and six species of fish eggs. The Zoea stage of crabs and the post larval stage of Pleuronectids, probably plaice, began to make their appearance amongst the plankton. Five coastal areas were examined, also three off-shore stations and Port Erin Bay. The distribution of many of the organisms had now become fairly uniform. Diatoms were present in every area except Carnarvon Bay, and were represented by *Coscinodiscus* and *Biddulphia*. *Chaetoceros* and *Rhizosolenia* occurred at Port Erin in addition to the two others mentioned, but nowhere else. Twenty-nine organisms, including the eggs of ten species of fish, were noted from Port Erin in April.

The tow-nettings taken in May numbered ten, and comprised four collections from the Fishery Officers, and three surface and three bottom gatherings made by the steamer. The organisms represented in the material, including the eggs of four species of fish, reached a total of thirty-one. Nine species of Copepoda were noted. Of these, *Centropages hamatus*, *C. typicus*, *Acartia clausi* and *A. discaudata* were the most abundant; the last two in some cases forming the bulk of the material collected. Post larval pleuronectids were less numerous than in April, and young gadoids made their appearance for the first time. The presence of gelatinous algæ interfered to some extent with the working of the tow-nets in three of the other coastal areas investigated, and probably had some connection with the abnormal results. At Blackpool only *Pleurobrachia* and this alga were noted. The collection from Port Erin on May 11th was also rather remarkable. It was practically a gathering of *Chaetoceros*.

In June twelve collections were made, of which four were from near the bottom. Gelatinous algæ had by this

time become very abundant along the Welsh coast extending to Fishguard Bay, but apparently did not come very close to the land. None of the tow-nettings taken by the steamer produced a single copepod, while those taken off Tremadoc, Aberaron and Kilan Head, yielded six species. Out of a total of thirty organisms only eight occurred between two and three miles from the land. The alga was entirely absent from the tow-nettings taken by the Fishery Officers. The collection from Port Erin showed a great change from the previous month, and twenty organisms were noted. *Chaetoceros* had entirely vanished, its place being taken by a swarm of *Rhizosolenia* which was represented by a few individuals in May.

The organisms in Cardigan Bay plankton attained their highest number in July. Eleven collections were taken and thirty-six different forms, with a fairly uniform distribution, were found to be present in the area. No other portion of the Irish Sea, at any time during 1905 contained plankton so varied as occurred in this bay in the months of May, June, July and August. Various unusual forms appeared in July such as the larvæ of the crustaceans *Jaxea*, *Squilla*, and lobsters, also the rare copepods *Pontella lobiancoi* and *Monstrilla anglica*. The gelatinous alga was gradually disappearing from the water. The only areas that contained any were Carnarvon Bay and Bahama Bank off the Isle of Man. Diatoms were practically absent in all the regions investigated, a very few *Rhizosolenia* were noted at Port Erin and in Cardigan Bay, and *Coscinodiscus* at Port Erin only.

The tow-nettings taken during August numbered fourteen. Ten of these were collected by the steamer, and the remaining four by the Fishery Officers. A con-

considerable reduction in the number of organisms apparently set in early in the month; Diatoms, Ceratium and Coelenterata were entirely absent. The young lobsters had also gone from this area, but a few occurred in Carnarvon Bay and one in Llane Deep. The Protozoan *Noctiluca* made its first appearance in this bay during August, and was also diffused throughout the Irish Sea at that time. Young *Jarea*, young *Squilla* and *Pontella lobatirostris* continued to be represented. Fish eggs and young fishes had disappeared from all the coastal waters. At Port Erin one or two eggs of the Norway topknot still remained. Diatoms became more plentiful in other areas. Representatives of four genera were noted between Red Wharf Bay and Rhyll, one in the Ribble and two at Port Erin. In September five gatherings were taken. The number of organisms remained practically the same as in August, but a great change had taken place in the constituents of the plankton, not only here but all over the area. The larvae of Crabs, *Jarea* and *Squilla* had gone, and also some of the copepods, including the species of *Pontella*, *Anomalocera*, *Labidocera*, and a few others. Twelve species of copepoda were present in August and only seven in September. Diatoms, Ceratium and Coelenterata re-appeared, and small swarms of gasteropod and lamellibranch larvae were met with. Diatoms had become well diffused throughout the Irish Sea. Three genera were represented in Cardigan Bay, four along the North Wales coast, one at the mouth of the Ribble, Blackpool and Port Erin. Three species of Ceratium were present in every one of the areas examined, excepting Port Erin. Coelenterata were uniformly distributed. A few zoeta of crabs (*Porcellana* sp.), and late megalopa stages of other species were found along the North Wales coast and off the Ribble.

Only one collection could be made in October and so far as it goes it shows that the plankton had become almost as poor in constituents as we found during January. Practically only copepods remained, along with a few individuals belonging to other five groups. From the other areas examined we find that Diatoms were prevalent all over. Port Erin and Luce Bay were especially rich in species, no less than five being common to both. *Ceratium* was uniformly distributed in the northern division and *Noctiluca* extended from the coastal waters to the centre of the Irish Sea.

In November five collections were taken, and the plankton was very similar to that of October. Slight changes had occurred. *Chatoceros* was displaced by *Coscinodiscus*, and *Ceratium* by *Noctiluca*. Amongst the Copepoda *Anomalocera* had returned and *Calanus* took the place of *Pseudocalanus*. The Plankton in the other areas remained practically the same as in the previous month. *Acanthometra* appeared at Port Erin for the first time in the year.

The weather during December was unsettled, and the work in consequence was restricted to fewer areas. Eleven tow-nettings were taken in Cardigan Bay and revealed a considerable development in the plankton. The constituents numbered twenty-four. *Coscinodiscus*, *Ceratium*, Cœlenterata, and *Pseudocalanus* re-appeared. A single specimen of a developing egg of the plaice was found in a bottom collection on the 15th which makes the earliest record for the Irish Sea.

The year 1905 was remarkable for the huge swarms of single organisms that made their appearance from time to time throughout the whole of the territorial waters between the Duddon and Fishguard Bay. We do not remember any previous occasion on which these invasions

were so marked. In some cases these visits were strictly local, and in others diffused over a wide area. The following are the most striking instances, giving the date and locality of the occurrence, and also the name of the organism:—

- Jan. 26. Patches Buoy, Aberystwyth. *Sagitta*.
 „ 27. Off Llanon, Cardigan Bay. „
 Feb. 21. Tremadoc Bay. Diatoms (*Coscinodiscus*).
 Mar. 28. Off the mouth of the Duddon. *Sagitta*.
 April 4. Carnarvon Bay. Ostracod stage of Barnacles.
 „ 18. Tremadoc Bay. Copepods (*Temora longicoruis*).
 „ 29. Off New Quay Head. „ „ „
 May 11. Port Erin. Diatoms (*Chatoceros*).
 June 11. Red Wharf Bay. Diatoms (*Coscinodiscus* and
Biddulphia).
 „ 15. New Quay Head. Copepods (*Centropages* and
Acartia).
 „ 19. Port Erin. Diatoms (*Rhizosolenia*).
 „ 23. Fishguard Bay. Crustacea (Megalopa of Crabs).
 „ 27. Llandudno Bay. *Noctiluca*.
 „ 28. Off Puffin Island. „
 „ 29. Entrance to Mersey. „
 „ 30. Blackpool. „
 July 5. Red Wharf Bay. „
 „ 5. Beaumaris Bay. „
 „ 7. Off St. Tudwall Islands. *Porcellana zoea*.
 „ 7. Off Nelson Buoy, Ribble. *Noctiluca*.
 „ 13. „ „ „ „
 „ 14. Off Ynys Fach, Cardigan Bay. Megalopa of
 Crabs.
 „ 17. Tremadoc Bay. Copepods, *Temora* and *Acartia*.
 „ 18. Off Nelson Buoy, Ribble. Cladocera (2 species
 of *Podon*).

- July 20. Carnarvon Bay. *Noctiluca*.
 „ 21. Tremadoc Bay. Copepods (*Acartia discaudata*).
 „ 21. Patches Buoy, Aberystwyth. *Rhizosolenia* and
Ceratium.
 „ 22. Off Llanon, Cardigan Bay. *Rhizosolenia* and
Ceratium.
 „ 25. Off the mouth of the Duddon. Crab *Megalopa*.
 „ 31. New Quay Head. Copepods *Temora* and *Acartia*.
 „ 31. Tremadoc Bay. *Porcellana* zoea.
 Aug. 1. Llandudno Bay. *Noctiluca*.
 „ 3. Entrance to Mersey. „
 „ 7. Off Nelson Buoy, Ribble. *Noctiluca*.
 „ 8. Tremadoc Bay. *Porcellana* zoea.
 „ 9. Off Llanon, Cardigan Bay. 100 *Squilla* larvæ,
 105 *Pontella lobiancoi*.
 „ 10. Carnarvon Bay. Zoea and *Megalopa* of Crabs.
 „ 16. Off Nelson Buoy. „ „ „ „
 „ 16. Llandudno Bay. Diatoms (four genera).
 „ 17. Beaumaris Bay. *Noctiluca*.
 „ 22. Off Nelson Buoy, Ribble. *Noctiluca*.
 „ 26. Blackpool. *Noctiluca*.
 „ 31. Patches Buoy, off Aberystwyth. 30 *Squilla* larvæ.
 Sep. 14. Entrance to Ribble. *Noctiluca*.
 Oct. 10. Off Liverpool N.W. Light Ship. *Noctiluca*.
 „ 24. Entrance to Mersey. *Sagitta*.

The appended table shews the occurrence of pelagic fish eggs during the year.

OCCURRENCE OF PELAGIC FISH EGGS.

The following table shows the distribution, month by month, in four divisions of the Irish Sea, of the species named:—

IN TERRITORIAL WATERS FROM BLACKPOOL TO RED WHARF BAY.

| Months. | Plaice. | Dab. | Flounder. | Brill. | Turbot. | Norwegian Top Knot. | Solenette. | Cod. | Haddock. | Whiting. | Bib. | Coal Fish. | Rockling. | Gurnard. | Common Dragonet. | Spotted Dragonet. | Weever. | Sprat. |
|-------------|---------|------|-----------|--------|---------|------------------------|------------|------|----------|----------|------|------------|-----------|----------|---------------------|----------------------|---------|--------|
| March | | | | | | | | | | + | + | + | + | | | | | |
| April | | | | | | | | + | + | | + | | + | | | | | + |
| May | | | | + | | | | | | | | | | | | | | + |
| June | | | | | | | + | | | | | | | | + | | + | + |
| July | | | | | | | | | | | | | | | + | + | + | |

IN CARDIGAN BAY.

| | | | | | | | | | | | | | | | | | | |
|----------------|---|---|---|---|--|---|---|---|---|--|---|---|---|--|---|--|---|---|
| January | + | | | | | | | | | | | | | | | | | |
| February..... | + | + | + | | | | | | + | | + | + | | | | | | |
| March | + | + | + | | | | | + | | | | | | | | | | |
| April | + | | | + | | | | | | | | + | + | | + | | | + |
| May | | | | + | | | + | | | | | | + | | | | | + |
| June | | | | + | | | + | | | | | | + | | | | + | + |
| July | | | | | | + | | | | | | | | | | | + | |
| December | + | | | | | | | | | | | | | | | | | |

ON OFF-SHORE GROUNDS, N.W. OF PIEL TO LIVERPOOL N.W. LIGHT SHIP.

| Months. | Plaice. | Dab. | Flounder. | Brill. | Turbot. | Norwegian Top Knot. | Solenette. | Cod. | Haddock. | Whiting. | Bib. | Coal Fish. | Rockling. | Gurnard. | Common Dragonet. | Spotted Dragonet. | Weever. | Sprat. |
|---------------|---------|-------|-----------|--------|---------|------------------------|------------|-------|----------|----------|-------|------------|-----------|----------|---------------------|----------------------|---------|--------|
| February..... | + | | | | | | | + | + | + | + | + | + | | | | | |
| March..... | + | + | + | | | | | | + | + | | | + | | | | | |
| April..... | + | | + | | | | | | | | | | | | | | | |
| May..... | | | | | | | | | | | | | | | | | | |
| June..... | | | | | | | | | | | | | | | | | + | |

IN VICINITY OF PORT ERIN.

| | | | | | | | | | | | | | | | | | | | |
|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| April..... | + | + | ..... | + | + | + | ..... | ..... | ..... | + | + | + | ..... | ..... | ..... | ..... | ..... | ..... | + |
| May..... | ..... | ..... | ..... | + | + | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | + |
| June..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| July..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| August..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |

February.

| | Blackpool. | Ribble Estuary. | Mersey Estuary. | Rhyl to Red Wharf Bay. | Carnarvon Bay. | Cardigan Bay. | Fishguard Bay. | Off Shore Stn. No. 1. | Off Shore Stn. No. 2. | Off Shore Stn. No. 3. | Bahama Bank. | Lame Deep. | Port Erin. | Port Erin. | |
|-------------------------------|------------|-----------------|-----------------|------------------------|----------------|---------------|----------------|-----------------------|-----------------------|-----------------------|--------------|------------|------------|------------|---|
| Chaetoceros | | | | | | | | | | | | | | + | |
| Biddulphia | | | | | | + | + | | | | | | | + | |
| Rhizosolenia | | | | | | | | | | | | | | + | |
| Coscinodiscus | | | | | | | | | | | | | | + | |
| Ceratium tripos..... | | | | | | | | | | | | | | + | |
| Ceratium fuscus | | | | | | | | | | | | | | + | |
| Ceratium furca | | | | | | | | | | | | | | + | |
| Sagitta bipunctata | | | | | + | + | + | + | | | + | | | + | |
| Autolytus prolifer..... | + | | | | + | + | | | | | | | | + | |
| Larval Polychaeta | | | | | | + | | | | | | | | | |
| "Mitraria" | | | | | | | | | | | | | | | |
| Pleurobrachia pileus | | | | | | | | | | | | | | | |
| Medusoid gonophores | + | | | | | | | | | | | | | | + |
| Pluteus | | | | | | | | | | | | | | | |
| Mysis stage of Crangon | + | | | | | | | + | | | | | | | |
| Calanus helgolandicus | | | | | | + | + | | | | | | | | |
| Pseudocalanus elongatus | + | | | | | + | + | + | | | | | | | |
| Paracalanus parvus | + | | | | | + | + | + | | | | | | | |
| Temora longicornis | + | | | | | + | + | + | | | | | | | |
| Acartia clausi | + | | | | | + | + | + | | | | | | | |
| Acartia discaudata | | | | | | + | + | + | | | | | | | |
| Centropages hamatus | | | | | | + | + | + | | | | | | | |
| Centropages typicus | | | | | | + | + | + | | | | | | | |
| Anomalocera patersoni | | | | | | + | + | + | | | | | | | |
| Oithona similis | | | | | | + | + | + | | | | | | | |
| Cyclopina littoralis | | | | | | + | + | + | | | | | | | |
| Canuella perplexa | | | | | | + | + | + | | | | | | | |
| Euterpina acutifrons | | | | | | + | + | + | | | | | | | |
| Alteutha interrupta | | | | | | + | + | + | | | | | | | |
| Copepod nauplii | | | | | | + | + | + | | | | | | | |
| Cirriped nauplii..... | | | | | | + | + | + | | | | | | | |
| Oikopleura | | | | | | + | + | + | | | | | | | |
| Fish eggs | | | | | | + | + | + | | | | | | | |
| | 7 | — | — | — | 6 | 25 | 11 | 8 | — | — | 9 | — | 14 | | |

March.

| | Blackpool. | Ribble Estuary. | Mersey Estuary. | Rhyl to Red Wharf Bay. | Carnarvon Bay. | Cardigan Bay. | Fishguard Bay. | Off Shore Stn. No. 1. | Off Shore Stn. No. 2. | Off Shore Stn. No. 3. | Bahama Bank. | Lane Deep. | Port Erin. | Luce Bay. |
|--|------------|-----------------|-----------------|------------------------|----------------|---------------|----------------|-----------------------|-----------------------|-----------------------|--------------|------------|------------|-----------|
| <i>Aldulphia</i> | + | | | + | | + | | + | | + | + | | | |
| <i>Asciodiscus</i> | + | | | + | | + | | + | | + | + | | | |
| <i>Aspratium fusus</i> | | | | | | | | | | | | | | |
| <i>Aspiggitta bipunctata</i> | + | | | + | + | + | | + | | + | | | | |
| <i>Autolytus prolifer</i> | + | | | | | + | | + | | + | | | | |
| <i>Mitraria</i> | | | | | + | + | | + | | | | | | |
| <i>Neurobrachia pileus</i> | | | | | | + | | | | | | | | |
| <i>Podocoid gonophores</i> | + | | | | | | | | | | | | | |
| <i>Asiphea sivado</i> | | | | | | | | | + | | | | | |
| <i>Reganocyphanes norvegica</i> | | | | | | | | | + | + | + | | | |
| <i>Analysis stage of Crangon</i> | + | | | + | | | | + | + | + | | | | |
| <i>Alanus helgolandica</i> | | | | | | | | | + | + | + | | | |
| <i>Pseudocalanus elongatus</i> | + | | | + | + | + | | + | + | + | + | + | | |
| <i>Paracalanus parvus</i> | + | | | + | + | + | | + | + | + | + | + | | |
| <i>Paromera longicornis</i> | | | | + | + | + | | + | + | | + | + | | |
| <i>Parcartia clausi</i> | + | | | + | + | + | | + | + | | + | + | | |
| <i>Parcartia discaudata</i> | | | | | | + | | | | | | | | |
| <i>Parcentropages hamatus</i> | + | | | + | | + | | + | + | | + | | | |
| <i>Parathona similis</i> | | | | | | + | | + | | | + | | | |
| <i>Paracyclops littoralis</i> | | | | | | + | | | | | | | | |
| <i>Parardella thompsoni</i> | | | | | | | | | | | + | | | |
| <i>Parateutha interrupta</i> | + | | | | | | | + | + | + | + | | | |
| <i>Parathalassidra croni</i> | | | | | | | | | + | | | | | |
| <i>Paropepod nauplii</i> | | | | + | | + | | | + | | | | | |
| <i>Parparacalanus nauplii</i> | | | | + | | + | | | | | | | | |
| <i>Parparacalanus ostracod stage</i> | | | | | | + | | | | | | | | |
| <i>Parparab zoea</i> | + | | | + | | | | | + | | + | | | |
| <i>Parparakopleura</i> | | | | | | | | | | | + | | | |
| <i>Parparascidian eggs</i> | | | | | | + | | | + | | | | | |
| <i>Parparash eggs</i> | + | | | + | + | + | | + | + | + | + | | | |
| <i>Parpararvae</i> | | | | + | | | | | | | | | | |
| | 13 | — | — | 14 | 5 | 19 | — | 9 | 21 | 13 | 15 | 3 | — | — |

April.

| | Blackpool. | Ribble Estuary. | Mersey Estuary. | Rhyl to Red Wharf Bay. | Carnarvon Bay. | Cardigan Bay. | Fishguard Bay. | Off Shore Stn. No. 1. | Off Shore Stn. No. 2. | Off Shore Stn. No. 3. | Bahama Bank. | Lane Deep. | Port Erin. |
|---------------------------------|------------|-----------------|-----------------|------------------------|----------------|---------------|----------------|-----------------------|-----------------------|-----------------------|--------------|------------|------------|
| Chaetoceros | + | | + | + | | + | | + | | + | + | | + |
| Biddulphia | | | | | | | | | | | | | |
| Rhizosolenia | | | | | | | | + | | + | + | | + |
| Coscinodiscus | + | | + | + | | + | | | | | | | + |
| Ceratium fusus | | | | | | | | | | | | | |
| Pleurobrachia pileus | + | | + | | | + | | | | | | | |
| Medusoid gonophores | + | | + | | + | | | | | | | | |
| Alcyonium eggs | + | | + | + | | + | | | | + | | | |
| Sagitta bipunctata | + | | + | + | | + | | | | + | + | | |
| Autolytus prolifer. | + | | | + | | | | + | | + | + | | |
| Larval Polychæta | | | | + | | | | | | + | | | |
| "Mitraria" | | | | | | + | | | | | | | |
| Pasiphaea sivado | | | | + | | | | + | | | | | |
| Meganyctiphanes norvegica. | | | + | | | + | | | | + | | | |
| Mysis stage of Crangon | | | + | + | | | | + | | + | | | |
| Calanus helgolandicus | | | | + | | | | + | | + | | | |
| Pseudocalanus clongatus | + | | + | + | | + | | + | | | | | + |
| Paracalanus parvus | + | | + | + | + | + | | + | | | | | + |
| Temora longicornis | + | | + | + | | + | | + | | | | | + |
| Acartia clausi | + | | + | | | + | | + | | | | | + |
| Acartia discaudata | | | | + | | + | | + | | | | | + |
| Centropages hamatus | + | | + | + | | + | | + | | | | | + |
| Centropages typicus | | | | | | + | | | | | | | + |
| Anomalocera patersoni | | | | | | | | | | | | | + |
| Oithona similis | + | | | | | | | | | | | | + |
| Alteutha interrupta | | | | | | | | + | | | | | + |
| Copepod nauplii | + | | + | + | | + | | + | | | | | + |
| Barnacle nauplii | + | | + | + | + | + | | + | | + | | | + |
| Barnacle ostracod stage | | | | + | + | + | | | | | | | + |
| Crab zoea | + | | | + | | + | | + | | + | | | + |
| Podon intermedium | | | | | | | | | | | | | + |
| Podon leuckartii | | | | | | + | | | | | | | + |
| Oikopleura | | | | + | | + | | + | | | | | + |
| Ascidian eggs | | | + | + | | + | | + | | + | | | + |
| Fish eggs | + | | + | + | + | + | | + | | + | | | + |
| Fish larvæ | | | + | + | | + | | + | | + | | | + |
| Eurydice | + | | + | | + | | | | | | | | |
| Idotea linearis | + | | + | | | | | | | | | | |
| Idotea marina | + | | + | | | | | | | | | | |
| | 20 | — | 19 | 19 | 6 | 20 | — | 17 | — | 13 | 2 | — | 20 |

May.

| | Blackpool. | Ribble Estuary. | Mersey Estuary. | Rhyl to Red Wharf Bay. | Carnarvon Bay. | Cardigan Bay. | Fishguard Bay. | Off Shore Stn. No. 1. | Off Shore Stn. No. 2. | Off Shore Stn. No. 3. | Bahama Bank. | Lune Deep. | Port Erin. | Luce Bay. |
|-------------------------------|------------|-----------------|-----------------|------------------------|----------------|---------------|----------------|-----------------------|-----------------------|-----------------------|--------------|------------|------------|-----------|
| Chaetoceros | | | | | | | | | | | | | + | |
| Biddulphia | | | | + | | | | | | | | | + | |
| Coscinodiscus | | | | + | | + | | | | | | | + | |
| Rhizosolenia | | | | | | | | | | | | | + | |
| Gelatinous algae | + | | | + | + | | | | | | | | | |
| Ceratium tripos | | | | | | | | | | | | | + | |
| Ceratium furca | | | | | | | | | | | | | + | |
| Pleurobrachia pileus | + | | | | + | + | | | | + | | | | |
| Medusoid gonophores | | | | | + | + | | | | | | | | |
| Pluteus | | | | | | + | | | | | | | | |
| Sagitta bipunctata | | | | + | | + | | | | | | | | |
| Autolytus prolifer. | | | | | + | | | | | | | | | |
| Larval Polychæta | | | | | | + | | | | | | | | |
| "Mitraria" | | | | | | + | | | | | | | | |
| Mysis stage of Crangon | | | | | + | + | | | | + | | | | |
| Eurydice | | | | | + | | | | | | | | | |
| Zoea of Crabs | | | | | + | + | | | | + | | | | |
| Calanus helgolandicus | | | | | | + | | | | | | | | |
| Pseudocalanus elongatus | | | | | | + | | | | + | | | | |
| Paracalanus parvus | | | | | | + | | | | + | | | | |
| Temora longicornis | | | | + | | + | | | | + | | | | |
| Acartia clausi | | | | | | + | | | | + | | | | |
| Acartia discaudata | | | | | | + | | | | + | | | | |
| Centropages hamatus | | | | + | | + | | | | + | | | | |
| Centropages typicus | | | | | | + | | | | | | | | |
| Anomalocera patersoni | | | | | | | | | | + | | | | |
| Oithona similis | | | | | | + | | | | | | | + | |
| Copepod nauplii | | | | | | + | | | | + | | | | |
| Barnacle nauplii | | | | + | | + | | | | + | | | | |
| Barnacle ostracod stage | | | | + | + | + | | | | | | | | |
| Podon intermedium | | | | | | + | | | | | | | | |
| Oikopleura | | | | | | + | | | | | | | + | |
| Ascidian eggs | | | | | + | + | | | | | | | | |
| Fish eggs | | | | + | + | + | | | | + | | | + | |
| Fish larvae | | | | + | + | + | | | | + | | | | |
| | 2 | — | — | 10 | 11 | 26 | — | — | — | 13 | — | — | 9 | — |

June.

| | Blackpool. | Ribble Estuary. | Mersey Estuary. | Rhyl to Red Wharf Bay. | Carnarvon Bay. | Cardigan Bay. | Fishguard Bay. | Off Shore Stn. No. 1. | Off Shore Stn. No. 2. | Off Shore Stn. No. 3. | Bahama Bank. | Lune Deep. | Port Erin. | Luce Bay. |
|--------------------------------|------------|-----------------|-----------------|------------------------|----------------|---------------|----------------|-----------------------|-----------------------|-----------------------|--------------|------------|------------|-----------|
| Biddulphia | | | | | | + | | | | | | | + | |
| Rhizosolenia | | | | | | + | + | | | | | | + | |
| Coscinodiscus | | | | | | + | + | | | | | | + | |
| Gelatinous algae | | | | + | | | | | | | | | + | |
| Ceratium tripos..... | | | | + | | | | | | | | | + | |
| Noctiluca | + | | + | + | | | + | | | | | | + | |
| Pluteus | | | | | | + | | | | | | | | |
| Echinus pluteus | | | | | | + | | | | | | | | |
| Spatangus pluteus | | | | | | | | | | | | | + | |
| Pleurobrachia pileus | | + | + | + | | + | + | | | + | | | + | |
| Medusoid gonophores | | | | + | | | | | | | | | | |
| Young Aurelia | | | | + | | + | | | | | | | | |
| Sagitta bipunctata | | | | + | | + | + | | | | | | + | |
| Autolytus prolifer..... | | | | + | | | | | | | | | | |
| Larval polychaeta | | | | + | | + | | | | | | | | |
| "Mitraria" | | | + | | | + | | | | | | | | |
| Meganyctiphanes norvegica..... | | | | | | + | + | | | | | | | |
| Idotea marina | | | | | | + | | | | | | | | |
| Mysis stage of Crangon | | + | | | | + | | | + | | | | | |
| Crab zoea | + | | + | + | | + | + | | | + | | | + | |
| Crab Megalopa | | | + | + | | + | | | | + | | | | |
| Calanus helgolandicus | | | + | + | | | | | | | | | | |
| Pseudocalanus elongatus | | | | + | | | | | | + | | | + | |
| Paracalanus parvus | | | + | + | | + | | | | + | | | | |
| Temora longicornis | | | + | + | | + | + | | | + | | | + | |
| Acartia clausi | | | + | + | | + | | | | + | | | + | |
| Acartia discaudata | | | | + | | + | | | | | | | | |
| Centropages hamatus | | | + | + | | + | | | | | | | | |
| Centropages typicus | | | | | | + | | | | | | | | |
| Labidocera wollastoni | | | + | | | | | | | | | | | |
| Oithona similis | | | | + | | | | | | | | | + | |
| Copepod nauplii | + | | | | | + | | | | | | | + | |
| Barnacle ostracod stage | | | | + | | | | | | | | | + | |
| Podon intermedium | | | | | | + | | | | | | | + | |
| Evadne nordmani..... | | | | | | | | | | | | | + | |
| Oikopleura | | | + | + | | + | | | | + | | | + | |
| Ascidian eggs | | | | | | | + | | | | | | | |
| Fish eggs | | | + | + | | + | | | | | | | + | |
| Fish larvæ | | | | + | | + | | | | + | | | | |
| | 3 | 2 | 13 | 20 | — | 26 | 11 | — | — | 11 | — | — | 19 | |

July.

| | Blackpool. | Ribble Estuary. | Mersey Estuary. | Rhyl to Red Wharf Bay. | Carnarvon Bay. | Cardigan Bay. | Fishguard Bay. | Off Shore Stn. No. 1. | Off Shore Stn. No. 2. | Off Shore Stn. No. 3. | Bahama Bank. | Lane Deep. | Port Erin. | Luce Bay. |
|----------------------------|------------|-----------------|-----------------|------------------------|----------------|---------------|----------------|-----------------------|-----------------------|-----------------------|--------------|------------|------------|-----------|
| Adulphia | | | | | | | | | | | | | + | |
| Azozolenia | | | | | | + | | | | | | | + | |
| Latinous algae | | | | | + | | | | | | + | | + | |
| Aratum tripos | | + | + | | | + | | | | | + | | + | |
| Aratum fusus | | | | | | + | | | | | | | | |
| Aratum furca | | | | | | + | | | | | | | | |
| Actiluca | | + | + | + | + | | | | | | | | | |
| Chinus pluteus | | | | | | | | | | | + | | | |
| Eurobrachia pileus | + | + | | + | + | + | | | | | | | + | |
| Eudusoid gonophores | | + | | + | + | + | | | | | | | + | |
| Young Aurelia | | | | | | + | | | | | | | + | |
| Gemma bipunctata | + | + | | + | + | + | | | | | + | + | + | |
| Antolytus prolifer | | | | | | | | + | | | | | | |
| Amphoteris onisciformis | | | | | | | | + | | | + | + | + | |
| Arval Polychaeta | | + | | | | | | | | | | | | |
| Mittraria | | + | | | | + | | | | | | | | |
| Cystic stage of Crangon | | + | | + | + | + | | | | | + | | + | |
| Sea of crabs | + | + | + | + | + | + | | | + | | | + | | |
| Algalopa of crabs | + | + | | + | + | + | | | + | | | + | + | |
| Ichtheus stage of Squilla | | | | | | + | | | + | | | | | |
| Chelifer stage of Jaxea | | | | | | + | | | | | | | | |
| Plagic stage of lobster | | | | | | + | | | | | | | | |
| Antropages hamatus | + | + | + | + | | + | | | | | + | | | |
| Antropages typicus | | | | | | + | | | | | | | | |
| Eudocalanus elongatus | | | | | | | | | + | | + | + | + | |
| Calanus helgolandicus | | | | + | + | | | | + | | + | + | + | |
| Aracalanus parvus | | + | | | | + | | | | | | + | | |
| Memora longicornis | + | + | + | + | + | + | | | | | + | | + | |
| Parthia clausi | + | + | + | + | + | + | | | | | + | | + | |
| Parthia discaudata | | | | | | + | | | | | | | | |
| Parthia clavipes | | + | | | | + | | | | | + | | | |
| Parthia malocera patersoni | | + | | | | + | | | | | | + | | |
| Parthia wollastoni | + | + | + | | | + | | | | | | | | |
| Parthia lobiancoi | | | | | | + | | | | | | | | |
| Parthia similis | | | | | | + | | | | | | + | + | |
| Parthia perplexa | | | | | | + | | | + | | | | | |
| Parthia acutifrons | | | | | | + | | | | | | | | |
| Parthia interrupta | | + | | | | | | | | | | | | |
| Parthia anglica | | | | | | + | | | | | | | | |
| Parthia intermedium | | + | | | | + | | | | | | | + | |
| Parthia leuckartii | | + | | | | + | | | | | | | + | |
| Parthia nordmanni | | + | | | | + | | | | | | | | |
| Parthia nauplii | | | | | | | | | | | | | + | |
| Parthia stage of barnacle | | + | | | | | | | | | | | | |
| Parthia opleura | | + | | | | + | | | | | + | + | + | |
| Parthia eggs | | + | | | | | | | + | | | | | |
| Parthia eggs | + | + | + | + | | + | | | | | + | + | + | |
| Parthia larvæ | | | | | | + | | | | | | | | |
| Parthia stage Loligo | | | | + | | | | | | | | | | |
| | 10 | 25 | 8 | 13 | 11 | 34 | — | — | 8 | — | 14 | 11 | 20 | — |

August.

| | Blackpool. | Ribble Estuary. | Mersey Estuary. | Rhyl to Red Wharf Bay. | Carnarvon Bay. | Cardigan Bay. | Fishguard Bay. | Off Shore Stn. No. 1. | Off Shore Stn. No. 2. | Off Shore Stn. No. 3. | Bahama Bank. | Lame Deep. | Port Erin. |
|-----------------------------------|------------|-----------------|-----------------|------------------------|----------------|---------------|----------------|-----------------------|-----------------------|-----------------------|--------------|------------|------------|
| Biddulphia | | | | + | | | | | | | | | + |
| Rhizosolenia | | | | + | | | | | | | | | + |
| Coscinodiscus | | + | | + | | | | | | | | | + |
| Chaetoceros | | | | + | | | | | | | | | + |
| Gelatinous algae | | | | | | | | | | | | | + |
| Ceratium tripos..... | | + | | + | | | | | | | | + | + |
| Ceratium fusus | | + | | + | | | | | | | | + | + |
| Ceratium furca | | + | | + | | | | | | | | + | + |
| Noctiluca | + | + | + | + | | + | | | | | | + | |
| Pleurobrachia pileus | + | | | | | | | | | | | | |
| Medusoid gonophores | + | | | | | | | | | | | | |
| Sagitta bipunctata | + | + | | + | | + | | | | | | | + |
| Autolytus prolifer..... | | | | + | | + | | | | | | | |
| Larval Polychæta | | | | + | | | + | | | | | | |
| " Mitraria " | | + | | + | | + | + | | | | | | |
| Mysis stage of Crangon | | + | | + | | + | | | | | | + | |
| Zoea of Crabs..... | | + | + | + | + | + | | | | | | + | + |
| Megalopa of Crabs | | + | + | + | + | + | | | | | | + | + |
| Erichtheus stage of Squilla | | | | | | + | | | | | | + | |
| Trachelifer stage of Jaxea | | | | | | + | | | | | | + | |
| Pelagic stage of Lobster | | | | | | + | | | | | | + | |
| Calanus helgolandicus | | | | | | | + | | | | | | |
| Pseudocalanus elongatus | | | | | | | | | | | | | + |
| Paracalanus parvus | + | | | + | | + | + | | | | | + | |
| Temora longicornis | | + | | + | | + | + | | | | | + | + |
| Acartia clausi | | + | + | + | + | + | + | | | | | + | + |
| Acartia discaudata | | + | | | | + | | | | | | | |
| Centropages hamatus | + | | + | + | + | + | + | | | | | + | |
| Centropages typicus | | | | | | + | + | | | | | | |
| Isias clavipes | | | | | | + | + | | | | | | |
| Anomalocera patersoni | | + | | | + | + | + | | | | | | |
| Labidocera wollastoni | | | | | | + | | | | | | | |
| Pontella lobiancoi | | | | | | + | | | | | | | |
| Parapontella brevicornis | | | | | | | + | | | | | | + |
| Oithona similis | | | | | | | + | + | | | | | |
| Euterpina acutifrons | | | | + | | + | | | | | | | |
| Alteutha interrupta | | | | | | | + | | | | | | |
| Hersiliodes littoralis | | | | | | | | | | | | | |
| Copepod nauplii | | | | | | | | | | | | | + |
| Podon intermedium | | + | | | | + | + | | | | | | + |
| Podon leuckartii | | + | | | | + | + | | | | | | + |
| Eurydice | | + | | | | | | | | | | | + |
| Idotea marina | | | | | | | | | | | | + | |
| Oikopleura | | + | | | | + | | | | | | | + |
| Ascidian eggs | | + | | | | + | | | | | | | |
| Fish eggs | | | | | | | | | | | | | + |
| | 6 | 19 | 5 | 20 | 6 | 25 | 15 | — | — | — | — | 18 | 17 |

September.

| | Blackpool. | Ribble Estuary. | Mersey Estuary. | Rhyl to Red Wharf Bay. | Carnarvon Bay. | Cardigan Bay. | Fishguard Bay. | Off Shore Stn. No. 1. | Off Shore Stn. No. 2. | Off Shore Stn. No. 3. | Bahama Bank. | Lune Deep. | Port Erin. | Luce Bay. |
|--|------------|-----------------|-----------------|------------------------|----------------|---------------|----------------|-----------------------|-----------------------|-----------------------|--------------|------------|------------|-----------|
| <i>Biddulphia</i> | | | | + | | + | | | | | | | | |
| <i>Rhizosolenia</i> | + | | | + | | | | | | | | + | + | |
| <i>Coscinodiscus</i> | | + | | + | | + | | | | | | + | | |
| <i>Chaetoceros</i> | | | | + | | + | | | | | | | | |
| <i>Ceratium tripos</i> | + | + | | + | | + | | | | | | + | | |
| <i>Ceratium fusus</i> | + | + | | + | | + | | | | | | + | | |
| <i>Ceratium furca</i> | + | + | | + | | + | | | | | | + | | |
| <i>Noctiluca</i> | + | + | | + | | | | | | | | + | | |
| <i>Spatangus pluteus</i> | | | | + | | | | | | | | | | |
| <i>Pleurobrachia pileus</i> | + | + | | + | | + | | | | | | | + | |
| <i>Medusoid gonophores</i> | | + | | | | + | | | | | | | + | |
| <i>Sagitta bipunctata</i> | + | + | | + | | + | | | | | | + | + | |
| <i>Tomopteris onisciformis</i> | | | | + | | | | | | | | | + | |
| <i>Larval Polychæta</i> | + | + | | | | + | | | | | | + | | |
| " <i>Mitraria</i> " | | | | + | | + | | | | | | | | |
| <i>Mysis</i> stage of <i>Crangon</i> | + | + | | + | | + | | | | | | + | | |
| <i>Zoea</i> of Crabs | | + | | + | | | | | | | | | | |
| <i>Megalopa</i> of Crabs | | + | | + | | | | | | | | | | |
| <i>Calanus helgolandicus</i> | | | | | | | | | | | | | + | |
| <i>Pseudocalanus elongatus</i> | | | | | | | | | | | | | + | |
| <i>Paracalanus parvus</i> | + | + | | + | | + | | | | | | + | + | |
| <i>Temora longicornis</i> | + | + | | + | | + | | | | | | + | | |
| <i>Acartia clausi</i> | + | + | | + | | + | | | | | | | | |
| <i>Centropages hamatus</i> | + | + | | + | | + | | | | | | + | | |
| <i>Anomalocera patersoni</i> | | + | | + | | | | | | | | + | | |
| <i>Labidocera wollastoni</i> | | + | | + | | | | | | | | | | |
| <i>Oithona similis</i> | + | + | | + | | + | | | | | | + | + | |
| <i>Canuella perplexa</i> | | | | | | + | | | | | | | | |
| <i>Euterpina acutifrons</i> | | | | + | | + | | | | | | | | |
| <i>Hersiliodes littoralis</i> | | | | + | | | | | | | | | | |
| Copepod nauplii | | | | | | | | | | | | | + | |
| <i>Podon intermedium</i> | | | | | | + | | | | | | | + | |
| <i>Podon leuckartii</i> | | | | | | + | | | | | | | + | |
| <i>Eurydice</i> | + | + | | | | | | | | | | | | |
| <i>Idotea linearis</i> | + | | | | | | | | | | | + | | |
| <i>Idotea marina</i> | + | + | | | | | | | | | | + | | |
| <i>Oikopleura</i> | | + | | + | | + | | | | | | + | + | |
| Ascidian eggs | | + | | | | + | | | | | | + | | |
| Young gasteropods | | | | | | + | | | | | | | | |
| Young lamellibranchs | | | | | | + | | | | | | | | |
| | 17 | 23 | — | 26 | — | 25 | — | — | — | — | — | 18 | 13 | — |

October.

| | Blackpool. | Ribble Estuary. | Mersey Estuary. | Rhyl to Red Wharf Bay. | Carnarvon Bay. | Cardigan Bay. | Fishguard Bay. | Off Shore Stn. No. 1. | Off Shore Stn. No. 2. | Off Shore Stn. No. 3. | Bahama Bank. | Lane Deep. | Port Erin. | Luce Bay. |
|--|------------|-----------------|-----------------|------------------------|----------------|---------------|----------------|-----------------------|-----------------------|-----------------------|--------------|------------|------------|-----------|
| <i>Biddulphia</i> | + | | | | | | | | | | | | + | + |
| <i>Rhizosolenia</i> | | | | + | | | | | | | | | + | + |
| <i>Chaetoceros</i> | | | | | | + | | | | | | | + | + |
| <i>Coscinodiscus</i> | + | + | + | + | | | | | + | + | | | + | + |
| <i>Bacteriastrium</i> | | | | | | | | | | | | | + | + |
| <i>Bellerophon</i> | + | | | | | + | | | | | | | | |
| <i>Dietylium</i> | | | | | | | | | | | | | | + |
| <i>Thalassiothrix</i> | | | | | | | | | | | | | | + |
| <i>Ceratium tripos</i> | + | | + | | | | | | + | | | | + | + |
| <i>Ceratium fusus</i> | + | | + | | | + | | | + | | | | + | + |
| <i>Ceratium furca</i> | + | | + | | | | | | + | | | | + | + |
| <i>Noctiluca</i> | + | + | + | | | | | | + | + | | | + | + |
| Starfish pluteus | | | + | | | | | | | | | | + | + |
| <i>Pleurobrachia pileus</i> | + | | | | | + | | | + | | | | + | + |
| Medusoid gonophores | + | | | | | | | | | + | | | + | + |
| <i>Sagitta bipunctata</i> | + | + | + | + | | + | | | + | | | | + | + |
| <i>Autolytus prolifer</i> | + | | | | | | | | | | | | + | + |
| Larval Polychaeta | + | | | | | | | | | | | | + | + |
| "Mitraria" | | | | | | + | | | | | | | + | + |
| Mysis stage of Crangon | + | | | + | | | | | + | | | | + | + |
| <i>Meganyctiphanes norvegica</i> | | | | | | | | | | | | | | + |
| Megalopa of crabs | | | | + | | | | | + | | | | | + |
| <i>Calanus helgolandicus</i> | | | | + | | | | | | | | | | + |
| <i>Pseudocalanus elongatus</i> | | | | | | | | | | | | | | + |
| <i>Paracalanus parvus</i> | + | | + | + | | + | | | | | | | + | + |
| <i>Temora longicornis</i> | + | | + | + | | + | | | | | | | + | + |
| <i>Acartia clausi</i> | + | | + | + | | + | | | + | + | | | + | + |
| <i>Centropages hamatus</i> | + | + | + | + | | + | | | + | + | | | + | + |
| <i>Anomalocera patersoni</i> | | | + | | | | | | | | | | | + |
| <i>Labidocera wollastoni</i> | + | | | + | | | | | | + | | | + | + |
| <i>Oithona similis</i> | + | | | + | | + | | | + | + | | | + | + |
| <i>Euterpina acutifrons</i> | + | | + | + | | + | | | | | | | + | + |
| <i>Hersiliodes littoralis</i> | | | | + | | | | | | | | | + | + |
| Copepod nauplii | | | | | | | | | | | | | + | + |
| <i>Idotea marina</i> | + | | | | | | | | | | | | + | + |
| <i>Oikopleura</i> | | | | + | | + | | | | | | | + | + |
| Ascidian eggs | | | | | | | | | | | | | + | + |
| | 21 | 4 | 12 | 15 | — | 13 | — | — | 12 | 9 | — | — | 19 | 22 |

November.

| | Blackpool. | Ribble Estuary. | Mersey Estuary. | Rhyl to Red Wharf Bay. | Carnarvon Bay. | Cardigan Bay. | Fishguard Bay. | Off Shore Stn. No. 1. | Off Shore Stn. No. 2. | Off Shore Stn. No. 3. | Bahama Bank. | Lane Deep. | Port Erin. | Luce Bay. |
|---|------------|-----------------|-----------------|------------------------|----------------|---------------|----------------|-----------------------|-----------------------|-----------------------|--------------|------------|------------|-----------|
| <i>Apidulphia</i> | | | | + | | | | | | | | | | |
| <i>Chizosolenia</i> | | | | + | | | | | | | | | + | |
| <i>Chaetoceros</i> | | | + | | | | | | | | | | | |
| <i>Coscinodiscus</i> | | | + | + | | + | | | + | + | | | + | |
| <i>Peratium tripos</i> | | | | + | | | | | | | | | + | |
| <i>Peratium fusus</i> | | | | + | | | | | + | | | | + | |
| <i>Peratium furca</i> | | | | + | | | | | | | | | + | |
| <i>Pocilluca</i> | | | | + | | | | | + | | | | + | |
| <i>Panathometra</i> | | | + | + | | + | | | + | + | | | + | |
| <i>Leurobrachia pileus</i> | | | + | + | | | | | | | | | + | |
| <i>Medusoid gonophores</i> | | | | + | | | | | | + | | | | |
| <i>Aggitta bipunctata</i> | | | + | + | | | | | | | | | | |
| <i>Autolytus prolifer</i> | | | | + | | + | + | | + | + | | | + | |
| <i>Comopteris onisciformis</i> | | | | + | | | | | | | | | | |
| <i>Parval polychaeta</i> | | | | | | + | | | | | | | | |
| <i>Mitraria</i> | | | | | | | | | | | | | + | |
| <i>Meganocyrtiphanes norvegica</i> | | | | | | | | | | | | | + | |
| <i>Cystis</i> stage of Crangon | | | | | | | + | | | | | | | |
| <i>Galathea</i> of crabs | | | | + | | + | + | | | | | | | |
| <i>Calanus helgolandicus</i> | | | | | | + | + | | + | | | | | |
| <i>Pseudocalanus elongatus</i> | | | | | | | + | | | | | | | |
| <i>Paracalanus parvus</i> | | | | | | | + | | | | | | + | |
| <i>Diaptomus longicornis</i> | | | | + | | + | + | | + | + | | | + | |
| <i>Parthysa clausi</i> | | | | + | | + | + | | + | + | | | | |
| <i>Centropages hamatus</i> | | | | + | | + | + | | + | + | | | + | |
| <i>Diaptomus clavipes</i> | | | | + | | + | + | | + | + | | | | |
| <i>Thomomys malocera patersoni</i> | | | | | | | | | | | | | | |
| <i>Thomomys bidocera wollastoni</i> | | | | + | | + | | | | | | | + | |
| <i>Thomomys thona similis</i> | | | | + | | + | | | | | | | | |
| <i>Hydropyros terpina acutifrons</i> | | | + | + | | + | | | | + | | | + | |
| <i>Hydropyros persilodes littoralis</i> | | | | | | + | | | | | | | + | |
| <i>Hydropyros cycaeus anglicus</i> | | | | | | | + | | | | | | | |
| <i>Hydropyros don intermedium</i> | | | | + | | | + | | | | | | | |
| <i>Hydropyros kopleura</i> | | | | + | | + | | | + | + | | | + | |
| | — | — | 10 | 20 | — | 15 | 11 | — | 10 | 11 | — | — | 15 | — |

FAUNISTIC NOTES.

By ANDREW SCOTT.

(1) *Acanthometra* sp.—This Radiolarian only occurred at Port Erin in November and December. In 1904 it was noted at Port Erin in February, and off Rhyl in March.

(2) *Noctiluca miliaris*.—A most extensive visitation of this organism took place in 1905, and its movements at the beginning appear to be peculiar. It was first noted in a collection from the Mersey on June 7th, then at Port Erin on the 19th, and at Fishguard Bay on the 23rd. It did not occur in the tow-nettings taken on the North Wales Coast on June 6th, 20th or 21st, nor in twenty-three gatherings from Cardigan Bay, representing the whole of June and July. At the end of June it had become well diffused in the Northern area, and continued to be so for the rest of the year. It turned up in Carnarvon Bay on July 20th and in Cardigan Bay in August. These records seem to point to a southerly drift rather than a northerly, though one naturally expects that the invasion would come from the South with the greater volume of water that enters the area by the South Channel. An earlier collection at Port Erin, in June might have thrown more light on this point. In any case, some time would elapse before the organism reached the Lancashire side after appearing at the Isle of Man if the distribution took place from the North, and *Noctiluca* was not present at Port Erin on May 11th. Some of the tow-nettings taken during June, July and August off the Lancashire coast were pure collections of this protozoan. So far as we know *Noctiluca* has not occurred at Port Erin previous to 1905.

Every opportunity of examining fish for parasites of all kinds is taken full advantage of. Mr. Johnstone is working out the Protozoa and internal worms, the leeches, trematodes and crustacea being left to me. A number of trematodes have already been recorded in a former paper, but the group is by no means worked out.

(3) *Epibdella* sp.—Plate VIII., fig. 1.

Several specimens of a form closely resembling *Epibdella hippoglossi* (Müller) were found on the skin of the common dog-fish (*Scyllium canicula*). The fish were caught in the trawl net when the steamer was at work South of the Calf of Man in June, 1905. The parasites were confined to the head of the fish and were mostly round the gill slits. A single specimen was taken some years ago, but owing to its contracted state could not be worked out. The parasite measures about 2 mm. and the body is of an oval form, thin and flat. The suckers are rather difficult to make out, and so far as can be seen the posterior one has no hooks. Until more specimens are secured it is probably better to merely record its occurrences and leave it unnamed.

(4) *Acanthocotyle* sp.—Plate VIII., figs. 2-4.

A much contracted specimen, about 1.8 mm. long, belonging to this genus, described by Monticelli in 1888, was found when examining washings from trawl refuse brought up in Fishguard Bay in June, 1905. The usual habitat of the members of this genus is on the skin of skates and rays, and as a number of rays were taken in Fishguard Bay it is practically certain that the Trematode had been detached after the fish were captured. The genus is easily recognised by the large posterior sucker armed with numerous rows of teeth, and by the presence of a small secondary sucker or adhesive disk on the margin of the large one. The shape and position of the

adhesive disk is one of the characters by which species are defined. In three species the disk is circular, and in a fourth lingulate. Figure 4 shows the shape and position of the adhesive disk in the specimen from Fishguard Bay. This is the first time we have found the genus in the Irish Sea.

A number of bass (*Labrax*) and mackerel were examined during 1905. The Trematodes already recorded from these fish were again found.

(5) *Microcotyle labracis*, van Ben. and Hesse.—Plate IX., fig. 3,

(6) and *Diplectanum aequans*, Diesing.—Plate IX., fig. 4, are from the bass. The former is a large species, but appears to be rare, while the latter, a very small form, is always plentiful on the gills of the fish taken near Piel.

(7) *Octobothrium alosae*, Hermann.—Plate IX., fig. 1.

A large number of specimens were found on the gills of a shad, *Clupea alosae*, sent to us by Mr. Robert Jones, Fishery Officer at Carnarvon. Not previously recorded for the district.

(8) *Octobothrium scombri* (Kuhn)—Plate IX., fig. 2, is the mackerel trematode. This is a very slender species and easily overlooked.

Two members of the HIRUDINEA were added to our list during 1905.

(9) *Trachelobdella lophii* (van Ben. and Hesse), from the gill chamber of an angler fish (*Lophius piscatorius*) brought to the Piel laboratory by the steamer.

(10) *Platybdella soleae* (van Ben. and Hesse).

This is the little brown thread-like body often seen on the black side of the common sole. A number of the soles caught between Lancashire and the Isle of Man in 1905 were covered with the *Platybdella*.

(11) Larvae of Lobsters.—We have not previously met with these in the tow-nettings, and their occurrence amongst the plankton is worthy of special notice. One was taken off Ynys Fach on July 14th, one off Llanon on the 22nd, twelve in Carnarvon Bay on August 10th, and one in the last pelagic stage in Lune Deep on August 25th.

(12) The *Erichtheus* stage of *Squilla* was recorded for Cardigan Bay in the report published last year. It was found again in the same area in 1905. In July and August these larvae appeared to be fairly uniform in their distribution between Ynys Fach and St. Tudwall Islands, and extended seaward as far as the Patches Buoy off Aberystwyth. Over 100 specimens were found in a tow-netting off Llanon on August 9th.

(13) The *Trachelifer* stage of *Jaxea* has also been previously recorded. It occurred in 1905 in Cardigan Bay during the months of July and August, and in Lune Deep in August. Mackerel caught off Walney early in July were found to be feeding entirely on larval crustaceans, such as Zoea and Megalopa of Crabs, &c. One or two had been feeding exclusively on young *Jaxea*, and their stomachs were well filled.

(14) *Pontella lobiancoi*, Canu.—Plates ^{II} I. and ^{III} II.

A regular invasion of this rare Copepod into Cardigan Bay was noted in July and August. It has not been taken at any time on the British coasts until 1904, so far as we know. Two males and one female were found in a tow-netting taken off Llanon on October 27th of that year. In 1905 we have noted its occurrence on the following occasions:—July 3rd off St. Tudwall Islands, 14th off Ynys Fach, 17th Tremadoc Bay, 21st Tremadoc Bay, 22nd off Llanon, 31st both at New Quay Head and Tremadoc Bay, August 9th off Llanon (105 specimens), 15th New Quay Head. This is one of the *Pontellas* that has a lens

in the rostrum, but I find that the lens is somewhat rudimentary in the female though well developed in the male, as shown by the figures now given.

(15) *Monstrilla anglica*, Lubbock.—Plate IV.

Mention is made on page 46 in last year's Report of the occurrence of a *Monstrilla* in Luce Bay which appeared to be rather different from any of the described species. A number of males of the same form were taken off Llanon on July 22nd. After a careful examination of the appendages, I am inclined to regard it as only a variety of Lubbock's species. The fifth feet of the female are much longer and narrower than in typical specimens, and the male has a peculiar comb-like structure on the inner margin of the last joint of the antennules.

(16) *Corycaeus anglicus*, Lubbock.

Specimens of this rare Copepod were taken in a plankton collection from Fishguard Bay on November 11th, 1905. The late I. C. Thompson found it at Port Erin, but this is the first record of its appearance in the coastal waters of Wales.

(17) *Giardella thompsoni*, n. sp.—Plate ~~III~~

IV

Description of the male: Length, exclusive of furcal hairs, 1.37 mm.; body seen from above, cyclopoid in outline, moderately robust; antennules slender, seven jointed, about as long as the cephalic segment, third joint very short, fourth and seventh joints longer than any of the others; antennae and mouth organs (figs. 3-7) nearly similar to those of *G. callianassae*, Canu; swimming feet also like those of the type; endopodites in every pair longer than the exopodite; fifth feet two-jointed, narrow, and longer than the genital segment, outer margin of second joint furnished with two small spines; apex of the joint with a spine and a hair; abdomen five-jointed, fourth joint much shorter than the others; furca

moderately long and narrow, and equal to the combined lengths of the last three abdominal segments.

One specimen in a surface collection from Bahama Bank, March 7th, 1905.

This new species has a general resemblance to the type *G. callianassae*, but differs in having a more slender fifth foot, which has two marginal spines on the second joint instead of only one as shown by Canu, and by the shorter furca. The furca in Canu's species are nearly as long as the whole abdomen.

The species is dedicated to the memory of my colleague, I. C. Thompson, who studied the Copepods of Liverpool Bay for many years with marked success, as shown by his numerous reports on the subject.

(18) *Caligus scomberi*, Bassett Smith.—Plate VI

This parasite is occasionally found when examining the gill chambers of mackerel, and has already been recorded for the district. C. B. Wilson in Part I. of his work on the North American Parasitic Copepods* is inclined to doubt the validity of this species and the accuracy of the figures given by British authors. It appears desirable, therefore, that figures of the form from the Irish Sea should be given. We have not yet been fortunate enough to find the male, and the illustrations give the characteristic features of the female only. The parasite measures 5.57 mm. in total length, and the abdomen is composed of a single joint. There is a decided contraction near the distal end, but no trace of a division. The fourth feet are similar in structure to other *Caligi*, and have a basiopodite with a three-jointed exopodite. Sternal fork slender, sides rounded and tapering to a

* Proceedings of the United States National Museum, vol. xxviii., pp. 479-672 (reprint No. 1404).

blunt point. The width of each prong is about equal to one-third of the incision.

(19) *Anchorella scomberi*, Bassett Smith.—Plate VII

This species is here recorded for the first time from the Irish Sea, and has been found on the gill rakers of mackerel caught off Walney and in Carnarvon Bay in 1905.

(20) *Anchorella paradoxa*, van Beneden.—Plate VIII

Another Copepod parasite from the mackerel, not previously recorded for the area. It is found on the gill filaments, and thus differs in its habit from *A. scomberi*. This species is quite distinct from all the other British members of the genus, and is probably not an *Anchorella* at all. The male of *A. scomberi* has two pairs of maxillipeds, but I find after a careful examination that the male of *A. paradoxa* has only one pair.

(21) Fish Eggs.—A table showing the distribution from month to month is given on page 33. Two interesting records have been obtained from the examination of the plankton collected in 1905. The first and most important is the occurrence of plaice eggs at an earlier date than any previously known to us. On January 26th a spent female plaice was caught in the steamer's trawl net when at work off Aberystwyth, and two plaice eggs were captured in the surface tow-net. A bottom tow-netting taken on the same ground on December 15th contained one plaice egg in which the developing larvae was clearly visible. From the appearance of the larvae it is concluded that this egg had been spawned ten days earlier than the date on which it was captured. The occurrence of this egg seems to indicate that some of the plaice on the South Wales coast spawn early in December, and about very much the same time as plaice frequenting certain areas of the North Sea. The other point is the finding of the eggs of the spotted

dragonet *Callionymus maculatus*. The fish has already been recorded from the Irish Sea, but the eggs have not been met with in the district. So far we have only found them on two occasions—at Red Wharf Bay on July 5th, and at Port Erin on the 8th. They can only be distinguished from the eggs of the common dragonet by measuring the size of the hexagonal markings. The hexagons are much smaller in the egg of *C. maculatus* than in *C. lyra*.

(22) *Young Fishes*.—A large number of post larval pleuronectids were found amongst the plankton collected in March and April extending from Cardigan Bay to Liverpool Bar Lightship, and also in the neighbourhood of Port Erin. One young sole, 7·5 mm. long, was taken in Tremadoc Bay on June 21st, post larval brill near Puffin Island on June 28th and off Blackpool on July 4th, post larval *Zeugopterus* in Ramsey Bay on July 11th. Post larval stages of gadoids, *Belone*, rockling, weevers and *Liparis* also occurred occasionally in various parts of the district.

EXPLANATION OF PLATES.

PLATE II.

Pontella lobiancoi, Canu.—

- Fig. 1—Female seen from above, n.s. 4 mm. × 18.
 „ 2— „ antennule. × 45.
 „ 3— „ rostrum. × 68.
 „ 4— „ endopodite of first foot. × 143.
 „ 5— „ fifth pair of feet. × 68.
 „ 6— „ abdomen seen from left side. × 45.

PLATE III.

Pontella lobiancoi, Canu.—

- Fig. 1—Male seen from above, n.s. 3.7 mm. × 18.
 „ 2— „ rostrum. × 90.
 „ 3— „ right antennule. × 45.
 „ 4— „ right antennule, hinge joints. × 136.
 „ 5— „ fifth pair of feet. × 68.

PLATE IV.

Giardella thompsoni, n. sp.—

- Fig. 1—Male seen from above, n.s. 1.37 mm. × 68.
 „ 2— „ antennule. × 90.
 „ 3— „ antenna. × 90.
 „ 4— „ mandible. × 293.
 „ 5— „ first maxilla. × 293.
 „ 6— „ second maxilla. × 190.
 „ 7— „ maxilliped. × 136.
 „ 8— „ first foot. × 136.
 „ 9— „ third foot of endopodite, 2nd and 3rd
 joints only. × 136.
 „ 10— „ fourth foot. × 136.

PLATE V.

Monstrilla anglica, Lubbock.—

- Fig. 1—Female seen from above, n.s. 2.4 mm. \times 22.
 „ 2—Male seen from above, n.s. 1.4 mm. \times 45.
 „ 3— „ inner edge of last joint of antennule.
 \times 570.
 „ 4—Female abdomen. \times 102.
 „ 5— „ fifth pair of feet. \times 190.
 „ 6—Male fifth pair of feet. \times 190.

PLATE VI.

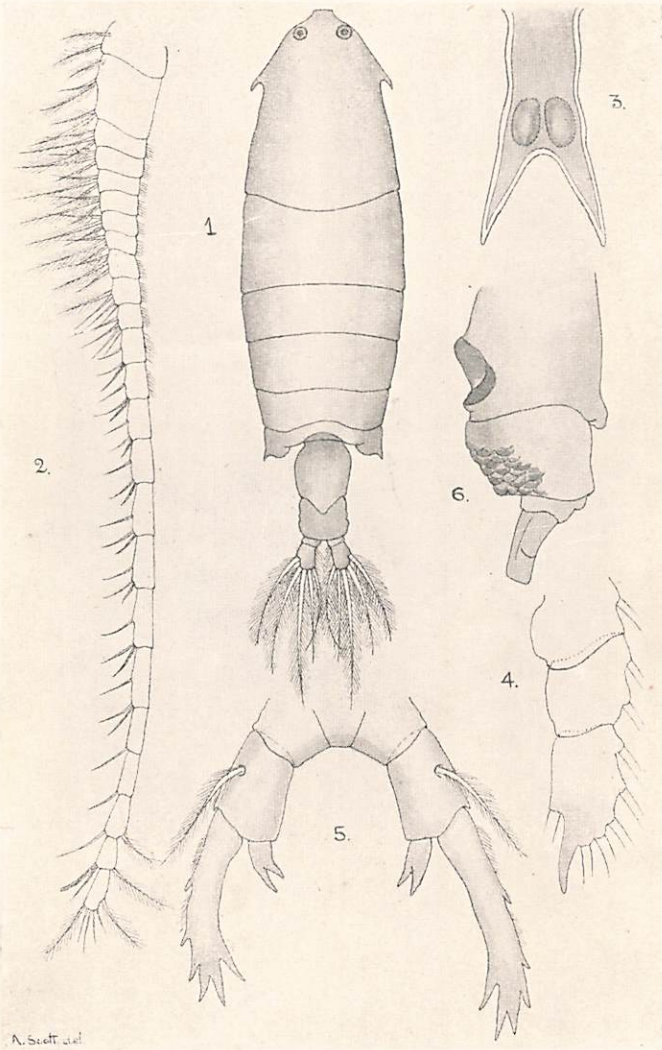
Caligus scomberi, Bassett-Smith.—

- Fig. 1—Female seen from above, n.s. 5.57 mm. \times 18.
 „ 2— „ antennule. \times 136.
 „ 3— „ antenna. \times 90.
 „ 4— „ first maxilliped. \times 90.
 „ 5— „ second maxilliped. \times 90.
 „ 6— „ fourth foot. \times 68.
 „ 7— „ sternal fork. \times 190.

PLATE VII.

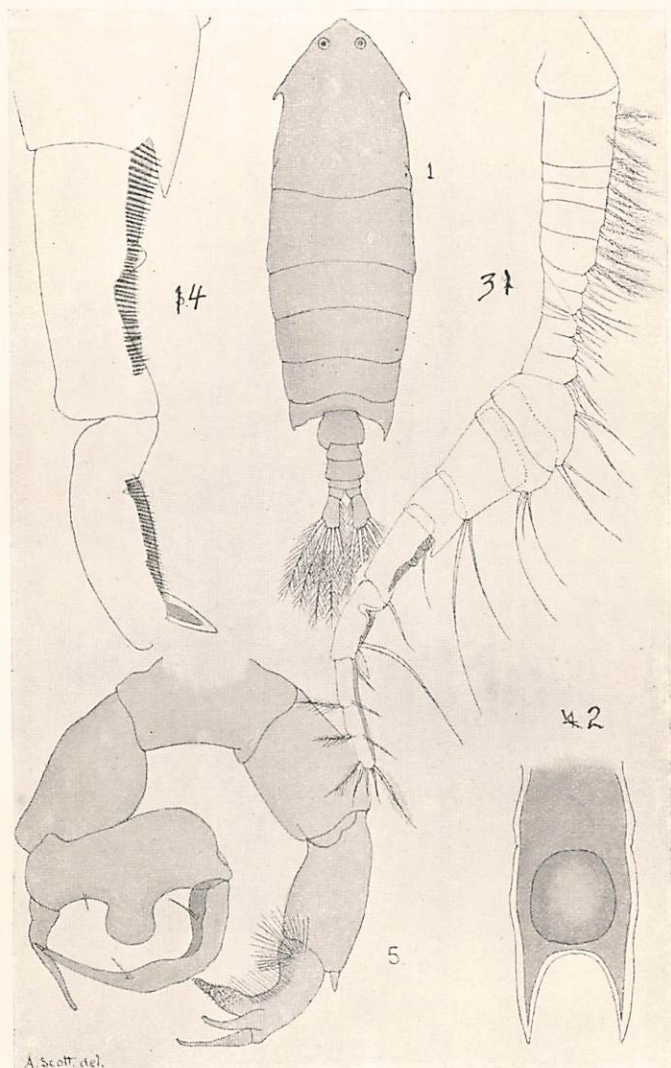
Anchorella scomberi, Bassett-Smith.—

- Fig. 1—Female *in situ*. \times 4.5.
 „ 2—Female. \times 7.5.
 „ 3—Male. \times 45.
 „ 4—Female antennule. \times 293.
 „ 5— „ antenna. \times 293.
 „ 6— „ mandible. \times 586.
 „ 7— „ maxilla. \times 293.
 „ 8— „ maxilliped. \times 190.
 „ 9—Male first maxilliped. \times 293.
 „ 10— „ second maxilliped. \times 293.

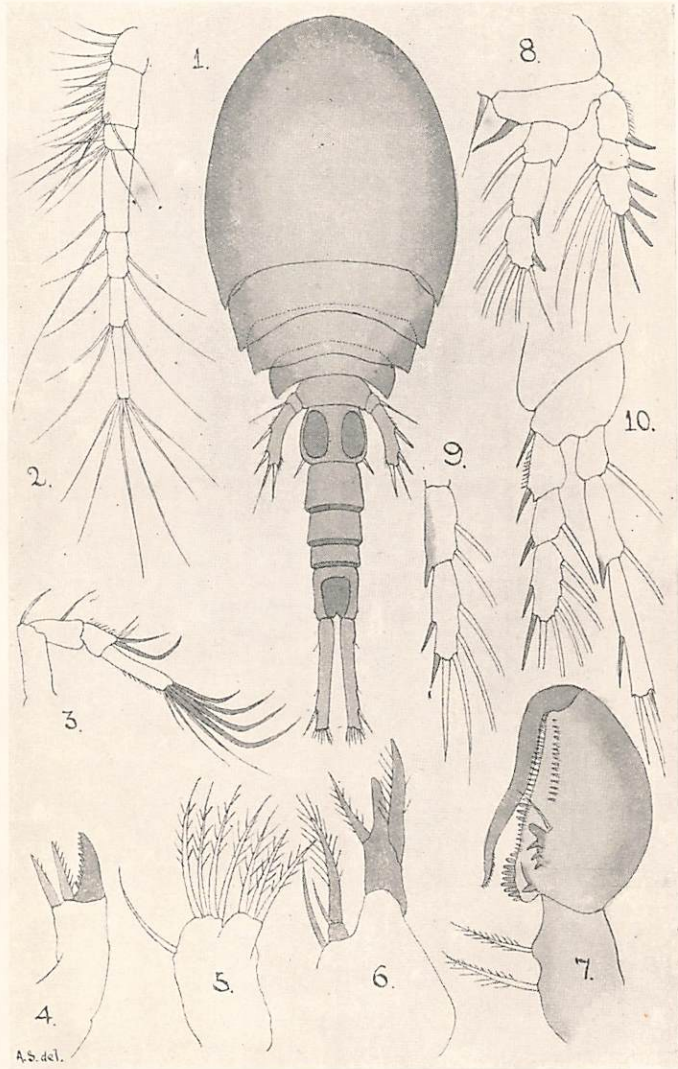


PONTELLA LOBIANCOI, Canu., female.

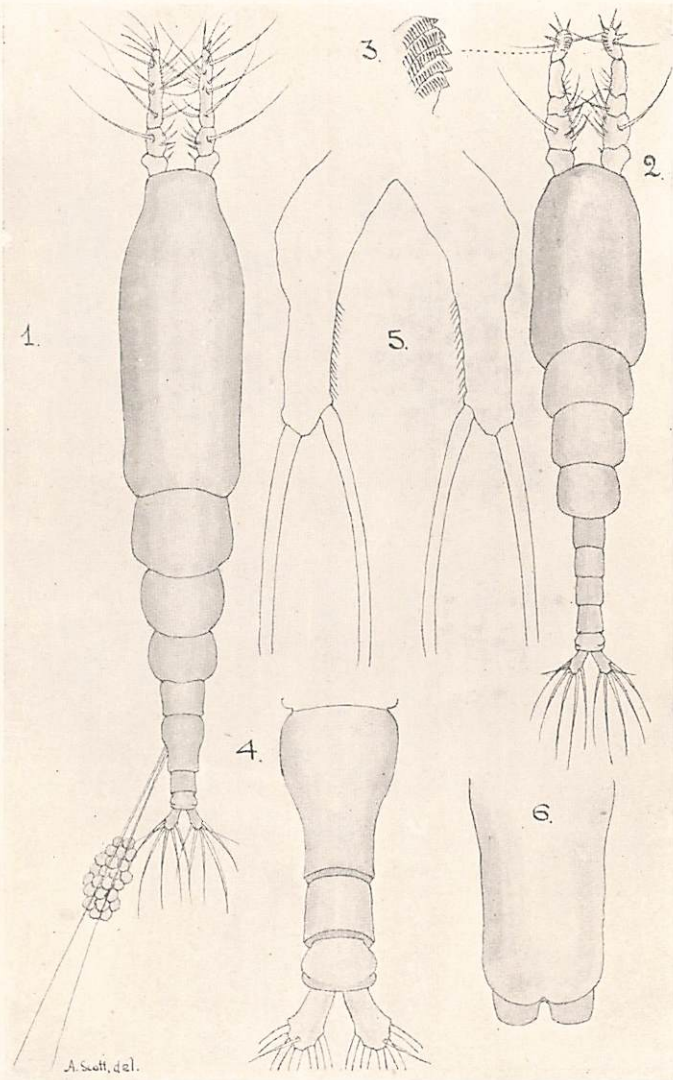




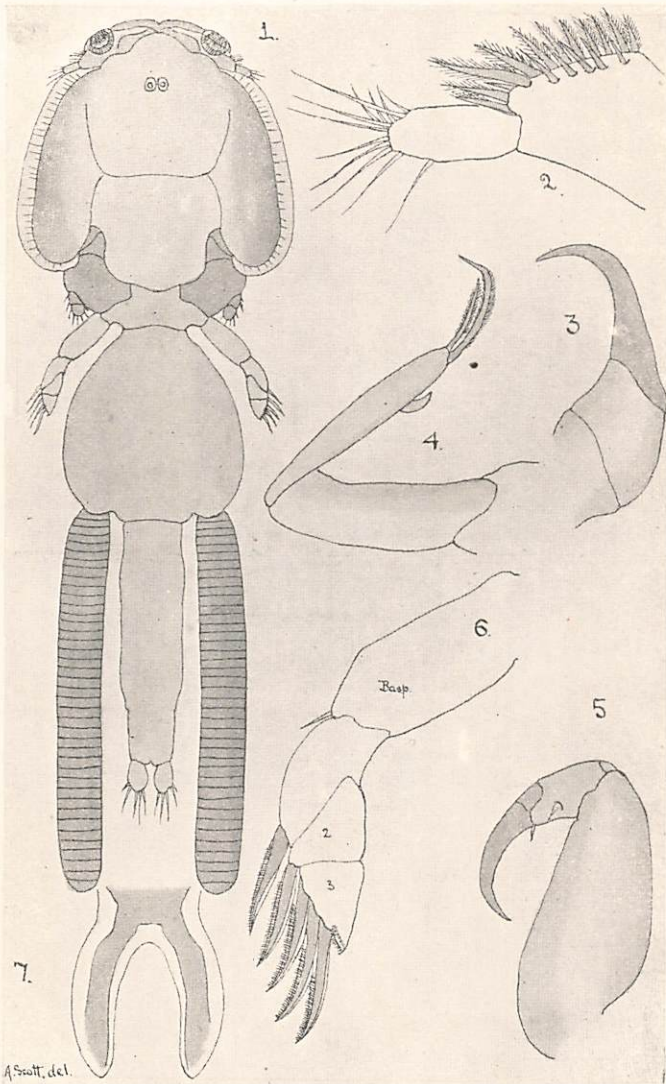
PONTELLA LOBIANCOI, Canu, male.



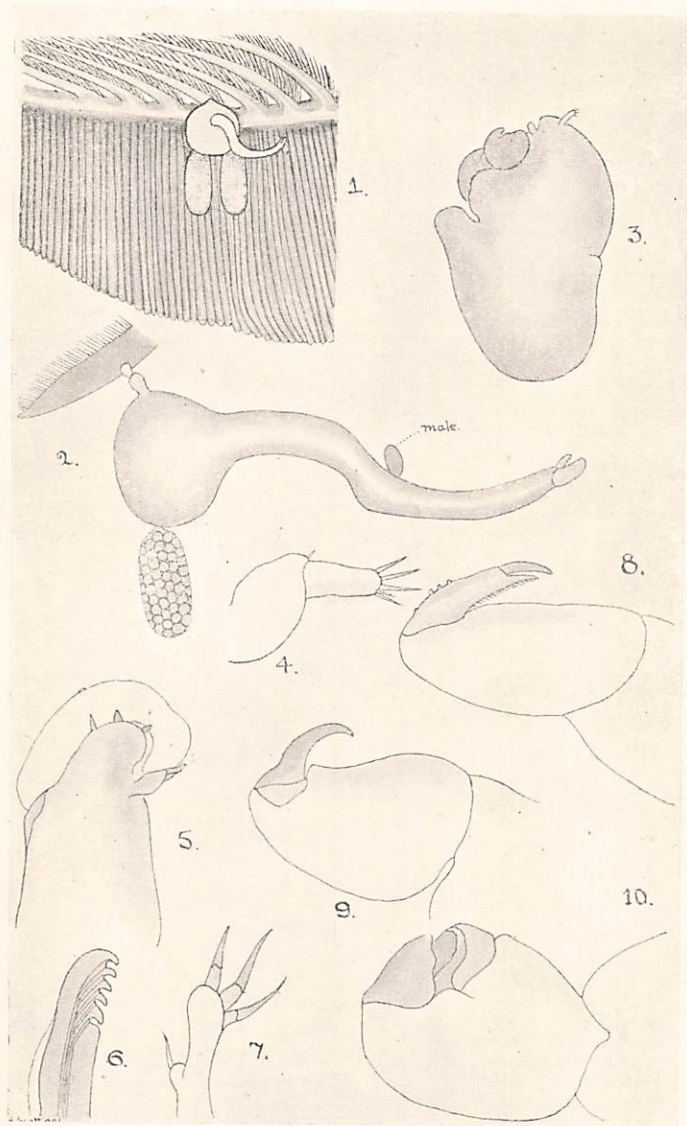
GIARDELLA THOMPSONI, n. sp.



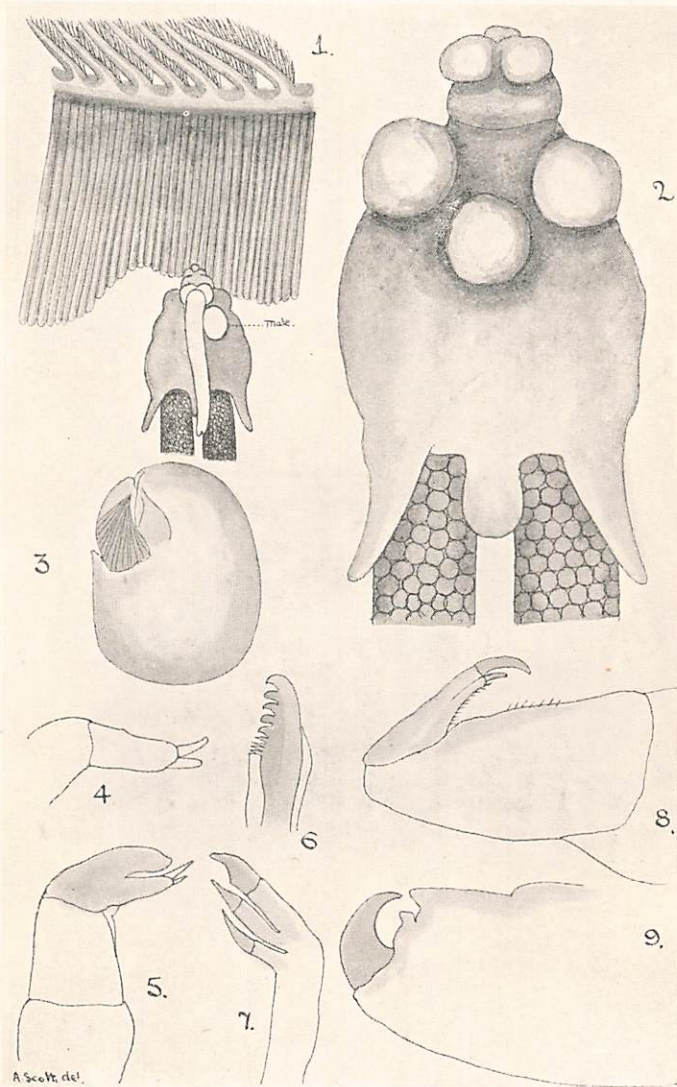
MONSTRILLA ANGLICA, Lubbock.



CALIGUS SCOMBERI, Bassett-Smith.



ANCHORELLA SCOMBERI, Bassett-Smith.



ANCHORELLA PARADOXA, van Beneden.

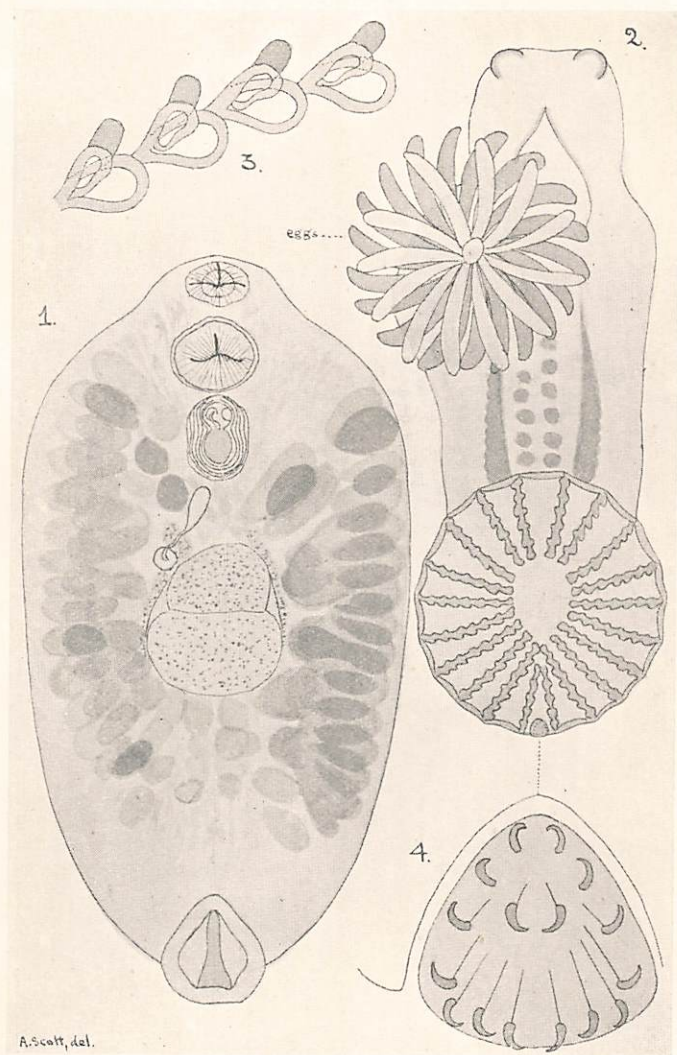
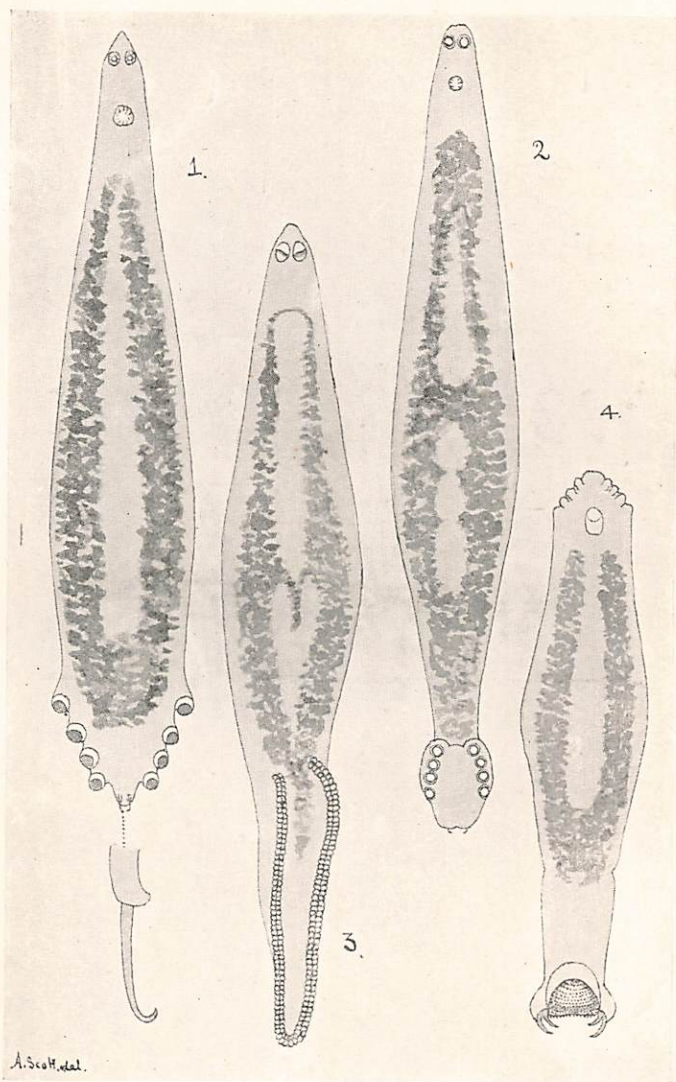


FIG. 1. ? EPIBDELLA, sp.

FIGS. 2-4. ACANTHOTYLE, sp.



- FIG. 1. *OCTOBOTHRUM ALOSAE*, Hermann.
 FIG. 2. ,, *SCOMBERI* (Kuhn).
 FIG. 3. *MICROCOTYLE LABRACIS*, v. Ben. & Hesse.
 FIG. 4. *DIPLECTANUM AEQUANS*, Diesing.

PLATE VIII.

Anchorella paradoxa, van Beneden.—

- Fig. 1—Female *in situ*. × 45.
 ,, 2— ,, (back view). × 18.
 ,, 3—Male. × 24.
 ,, 4—Female antennule. × 293.
 ,, 5— ,, antenna. × 190.
 ,, 6— ,, mandible. × 293.
 ,, 7— ,, maxilla. × 293.
 ,, 8— ,, maxilliped. × 190.
 ,, 9—Male maxilliped. × 136.

PLATE IX.

Epibdella, sp.—

- Fig. 1—Seen from ventral surface. × 45.

Acanthocotyle, sp.—

- Fig. 2—Seen from ventral surface. × 45.
 ,, 3—Teeth of one of the rays. × 353.
 ,, 4—Adhesive disc. × 586.

PLATE X.

- Fig. 1—*Octobothrium alosae*, Hermann, seen from ventral side. × 15.
 ,, 2—*Octobothrium scomberi* (Kuhn), seen from ventral side. × 18.
 ,, 3—*Microcotyle labracis*, van Ben. and Hesse, seen from ventral side. × 14.
 ,, 4—*Diplectanum aequans*, Diesing, seen from ventral side. × 34.

