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[MAY, 1900.]

# STUDIES FROM THE MARINE LABORATORY

OF THE

## ROYAL DUBLIN SOCIETY.

VOL. I.—PART I.:

SURVEY OF FISHING GROUNDS, WEST COAST OF IRELAND, 1890—1891:

X.—REPORT ON THE CRUSTACEA SCHIZOPODA OF IRELAND.

BY

ERNEST W. L. HOLT AND W. I. BEAUMONT, B.A. (CANTAB.)

(WITH ONE PLATE.)

COMMUNICATED BY DR. R. F. SCHARFF.



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I.—SURVEY OF FISHING-GROUNDS, WEST COAST OF IRELAND, 1890-1891.  
 X.—REPORT ON THE CRUSTACEA SCHIZOPODA OF IRELAND. BY  
 ERNEST W. L. HOLT, AND W. I. BEAUMONT, B.A., CANTAB. (PLATE I.)

COMMUNICATED BY DR. R. F. SCHARFF.

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WHEN the Survey terminated in 1891 all the collections, with the exception of certain duplicates otherwise disposed of by the Society, were handed over to the National Museum. A great deal of the material remained still unexamined, or had only been roughly sorted by one of us during the survey. This was especially the case with the smaller Crustacea and other minute forms taken in fine-meshed nets of various descriptions. We have recently been able, by the permission of Dr. R. F. Scharff, to examine a number of bottles containing such gatherings, and now present the results of our observations in so far as concerns the Schizopoda.

At the same time, since the energies of the Society are once more directed to the marine zoology of the country, we have endeavoured to compile as complete a list of Irish members of the group as can be obtained from all the material in the national collection, and from the meagre literature of the subject. Such a list, imperfect as it certainly is, cannot fail to be useful as a basis for future observations. It has been brought as far as possible up to date, while in press, by observations made at the Society's Marine Laboratory during the present year, and by the examination of the "Oceana" Collection.

Though in themselves of no commercial value, the Schizopoda form a most important item in the food of fishes, while the observed conditions of their distribution, and the pelagic or partially pelagic habit of at least some of the species appear likely to yield results of interest, were the subject adequately studied.

Norman's admirably useful synopsis of the British members† is sufficiently recent to enable us to confine our introductory remarks to a brief comparison of

† "British Schizopoda of the families Lophogastridæ and Euphausidæ." *Ann. Mag. Nat. Hist.*, S. 6, ix., 1892, p. 454, and "British Mysidæ," *ibid.*, x., 1892, p. 143.

the Irish fauna, as we at present know it, with that of the British Isles generally. Norman's list contains one species of Lophogastridæ, seven of Euphausidæ, and thirty-three of Mysidæ. Of the Euphausidæ, *Boreophausia inermis* (Kröyer), *B. Raschii* (M. Sars), *Thysanoessa longicaudata* (Kröyer), and *Nematoscelis megalops*, G. O. Sars, have not yet been taken in Irish waters. *Nematodactylus bööpis*, Calman, a recent addition to the family from deep water off the S.W. of Ireland, cannot yet be included in the British fauna, since it has only been taken at 1020 fathoms, or 20 fathoms below the line of soundings which constitutes Norman's western boundary of our zoological dominions. The same remark applies to *Eucopeia australis*; and these species will probably be met, as predicted by Norman in the case of *Euphausia pellucida*, Dana, within the British area.

Recent observations have altered Norman's list of British species of Mysidæ in personnel, but not in number, *Siriella frontalis*, M.-Edw., having been expunged from the list, while *Dasymysis (Acanthomysis) longicornis*, M.-Edw., has been added thereto.

We can find no record of the following species from Irish waters, nor are they represented in our material:—

- Siriella norvegica*, G. O. Sars.
- S. jaltensis*, Czern.
- S. Brooki*, Norman.
- Erythrops Goëssi*, G. O. Sars.
- E. elegans*, G. O. Sars.
- Schistomysis Helleri* (G. O. Sars).
- S. Parkeri*, Norman.

As some set-off to these deficiencies, we are able to add two species to the British list, viz. *Parerythrops obesa*, G. O. Sars, and *Mysidella typica*, G. O. Sars.

Two species, *S. norvegica* and *E. elegans*, have been recorded by Walker from the Irish Sea.† It seems improbable that they are absent from the coast of county Down, and, in fact, the observed differences in the British and Irish lists are unlikely to survive a proper investigation of the Irish area. The Society's surveying expeditions were concerned with the fishing-grounds, at that time in many cases unexplored. These grounds are mostly at considerable depths,

appear in the collection. The bulk of the survey material was taken in bags of mosquito-netting suspended inside the large beam trawl. This is, apparently, a most efficacious method of collecting Schizopods, but has the disadvantage of injuring the specimens on account of the strain against the meshes resulting from the comparatively high speed at which the trawl is hauled, and the frequent irruption of large fish, crabs, sand, and other injurious matters. Mosquito-netting is, moreover, rather coarse for such small creatures as *Erythrope elegans*, &c., and this must be borne in mind in considering the evidence afforded by our record of the numbers of different species taken in the several hauls.

In the systematic list it will be understood that we adopt Norman's classification and synonymy, unless the contrary is expressly stated. Further, in the brief account which we have given of the distribution, it has seemed to us desirable to condense the references by ascribing to Norman (A. M. N.\*) those records, whether original or compiled, which appear in his paper. In some cases we have condensed the record still further, as by substituting "E. and W. Scotland" for various localities on both coasts. Professor Sars' work is too well known to need mention here; while Norman has himself acknowledged the assistance of Mr. Thomas Scott† and others in the communication of British forms. The most important paper, after Norman's, dealing with Irish Schizopoda, is that of Mr. A. O. Walker.‡ Records other than Irish, which have appeared subsequent to Canon Norman's, are indicated by the author's name or initials. Mr. Walker's records from the Irish Sea, which are of importance on account of the propinquity of the localities to the Irish area and of the absence of any records from the adjacent parts of the Irish coast, are to be found in the Transactions of the Liverpool Biological Society. Where a locality is followed by a colon or full stop without the citation of an authority, it must be taken that we are ourselves responsible, while a note of exclamation indicates the confirmation by ourselves of the record of a previous observer.

Sub-order.—SCHIZOPODA.

Family.—LOPHOGASTRIDÆ.

Genus *Lophogaster*, M. Sars.

*Lophogaster typicus*, M. Sars.

*Not in the Survey Collection.*

*Museum, Dublin.*—50 miles W.  $\frac{1}{2}$  S. of Dursey head, 214 fathoms. July 15th, 1886.

† Mr. Scott's recent records are indicated below by the initials T. S.

‡ Trans. Liverpool Biol. Soc., xii., 1893, p. 164 (A. O. W.\*).

*Previous Irish Records.*—Off S.W. of Ireland, 90 (and 1630) fathoms (A. M. N.\*); off Co. Kerry, 40 fathoms (A. O. W.\*).

*Distribution.*—East of Shetland (A.M.N.\*).

Norway; Bay of Biscay; south of Cape of Good Hope (A. M. N.\*): Mediterranean (Caullery, Pruvot).

Family.—EUPHAUSIDÆ.†

Genus *Nyctiphanes*, G. O. Sars.

*Nyctiphanes norvegica* (M. Sars).

*Survey.*—Station 115, off the Skelligs, 62 to 52 fathoms, mud and sand. August 20th, 1890.

Station 165, 28 miles N.W. of Achill Head, 154 fathoms, sand, April 20th, 1891 (a number of specimens in the stomach of a black-mouthed dog-fish, *Pristiurus melanostoma*: they were bright blue before preservation).

*Marine Laboratory.*—8 miles off Achill Head, 13th April, 1899 (many specimens in stomach of mackerel from surface drift-net).

*Museum, Dublin.*—No. 114, 1896. Whitepool Bay, Co. Antrim, per Mr. R. Welch. A number of specimens cast up on the beach.

*Previous Irish Records.*—Off Valentia (A. M. N.\*): Valentia Harbour (A. O. W.\*): off N. of Ireland (Herdman).

*Distribution.*—East and west coasts of Scotland (A. M. N.\*): Irish Sea and North Channel (Herdman).

Norway, Faroë Channel, &c.; N.E. America (A. M. N.\*): Bay of Biscay (Caullery): N.E. America (Herdman).

The presence of these Schizopods in the stomach of a ground-fish like *Pristiurus* affords fairly conclusive proof that they are not at all times pelagic in habit. The specimens from off the Skelligs may have been taken either at the bottom or during the ascent of the net, and the same remark would seem to apply to creatures taken in any ordinary net which cannot be opened and closed at given depths. Professor Herdman obtained his material entirely at the surface by means of the pumps of an Atlantic liner (Trans. Liverpool Biol. Soc., xii., 1898, p. 33); and it is noteworthy that the species was only met with off the coasts of the European and American continents, and not in the central part of the Atlantic.

† *Euphausia pellucida*, Dana; *Stylocheiron* sp. See Note added in Press, p. 30.

**Nyctiphanes Couchii** (Bell).

Plate I. [xvi.], fig. 1; and fig. I., p. 6.

*Thysanopoda Couchii*, Bell, "British Stalk-eyed Crustacea," 1853, p. 346.

Bell's figure, the only drawing of the species with which we are acquainted, is on a very small scale, and not wholly satisfactory. By the kindness of Mr. C. Green, B.A. (T.C.D.), we are able to give a more detailed illustration of the whole animal, the subject in this case being a male from Valentia Harbour. We are indebted to Mr. M. F. Woodward for a dissection and drawing of the branchial apparatus of the same specimen, and of the copulatory processes of the first pleopods of this and the preceding species. We take the subjoined diagnosis, with slight verbal alteration, from Norman.

*Carapace* without lateral spines, its lobes not produced over the eyes. *Rostrum* broadly and bluntly triangular, concealing the base of the eye-stalks. A spine over the base of the *telson* and a small simple ventral preanal spine. In the male the *antennules*, in addition to the usual reflexed membranous leaflet at the end of the first joint, have another reflexed membranous leaflet at the end of the second joint of the peduncle, the distal portion of the leaflet being cut into digitated processes.

The copulatory apparatus of the inner plate of the first pleopod (fig. I., p. 226, 8) in a specimen of 12 mm. is not unlike that of *N. australis*, G. O. Sars (*cf.* Sars, Challenger Report, XIII., Pl. xxi., fig. 6). It is much less complicated than in full-grown *N. norvegica* (*cf.* fig. I., 9). We have had no opportunity of examining males of the last-named species at sizes corresponding to what appears to be the fully-developed condition of *N. Couchii*. (See Note added in Press, p. 30.)

*Not in the Survey Collection.*

Valentia Harbour, surface, September 30th, 1898, per Miss C. Delap.

*Previous Irish Record.*—Off Valentia (A. M. N.\*).

*Distribution.*—Banff; coast of Cornwall (A. M. N.\*): off Penlee Point, and in Cawsand Bay, Plymouth: Firth of Tay (per W. T. Calman).

Genus *Thysanoessa*, F. Brandt.

*Thysanoessa neglecta* (Kröyer).

*Survey.*—Station 130, Kenmare river, off Sneem, 24 fathoms, mud. March 30th, 1891 (in net attached to trawl, day-time).

Station 144, west of Inishmore, Aran Islands, about 45 fathoms, April 7th, 1891 (in large tow-net, near surface, midnight).

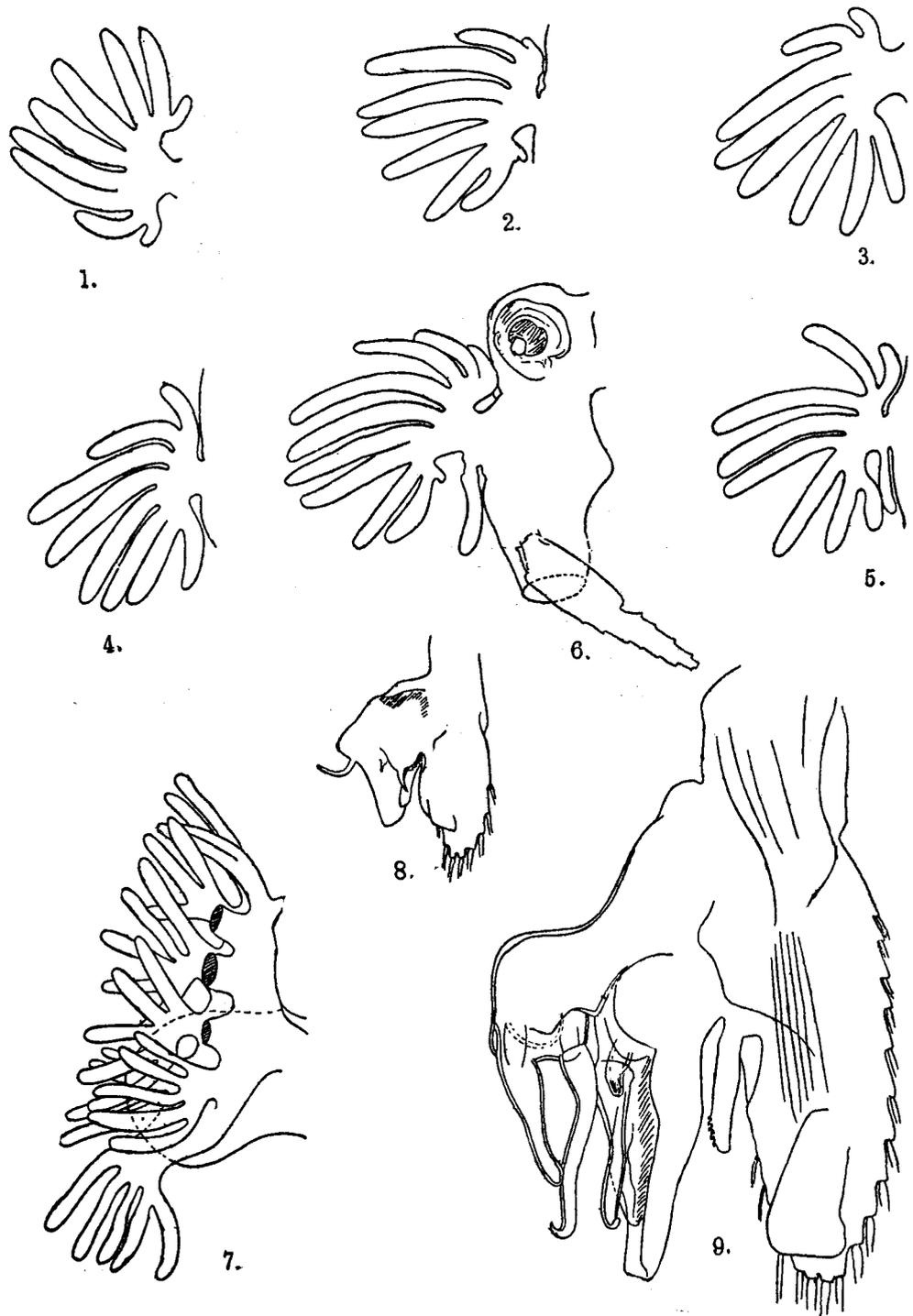


FIG. I.

FIGS.

- 1-5. The five anterior gills of the right side of *Nyctiphanes Couchii*, ♂, 12 mm., arranged in the natural order.
6. The sixth gill, with luminous organ and exopodite, of the same specimen.
7. The seventh thoracic appendage of the same specimen. Three of the external gill-plumes have been cut off.

FIGS.

8. Inner plate of the first pleopod of the same specimen.
9. Inner plate of the first pleopod of *Nyctiphanes norvegica*, ♂, 35 mm., from Upper Loch Fyne.

All figures drawn to the same scale with camera lucida.

The numerous specimens of St. 144 were taken while the S.S. "Harlequin" was tending on some local boats engaged in experimental mackerel-fishing. Some mackerel were caught, but their food was not examined.

*Marine Laboratory.*—4 miles west of High Island, Co. Galway, surface and bottom tow-nets at night, 16th June, 1899, and very common in stomachs of mackerel from surface drift-nets about the Bofin islands during the same month.

*No Previous Irish Record.*

*Distribution.*—Aberdeen; Firth of Forth; Loch Seaforth (A. M. N.\*): off Hebrides; mouth of English Channel (Ortmann).

Norway; Finmark; Siberia; N.E. America (A. M. N.\*): Bay of Biscay (Caullery).

Genus—**NEMATODACTYLUS**, Calman.

**Nematodactylus bööpis**, Calman.

CALMAN, Trans. R. I. Acad., xxxi., 1896, p. 17, Pl. II.

Off S.W. of Ireland, 1020 fathoms (Calman).

The species is not definitely British, as Norman's limit is the 1000 fathoms line. It is mentioned here for purposes of convenience.

Genus—**EUCOPIA**, Dana.

**Eucopia australis**, Dana.

CALMAN, Trans. R. I. Acad., xxxi., 1896, p. 15.

Off S.W. of Ireland, 1020 fathoms (Calman).

This is a cosmopolitan species from the deep water of the oceans; Calman considers that its occurrence at or near the surface must be regarded as exceptional. It has not yet been taken actually within the limits of the British area.

Family.—**MYSIDÆ**.

Sub-family.—**SIRIELLINÆ**.

Genus **Siriella**, Dana.

**Siriella Clausii**, G. O. Sars.

*Not in the Survey Collection.*

*Marine Laboratory.*—Blacksod Bay, 29th March, 1899, 6–8 fathoms; Inisbofin Harbour, 4th to 18th August, 1899, very common in surface and midwater nets at night, but not found, perhaps on account of abundance of drift-weed, during the day.

*Previous Irish Record.*—S.E. of Ferry pier, Valentia Harbour (A. O. W.\*)

*Distribution.*—Loch Fyne (A. M. N.\*): off Plymouth.†  
Mediterranean (A. M. N.\*).

† A *Siriella* of rather abnormal character, from Start Bay, is also probably referable to this species.

*Siriella armata* (Milne-Edwards).

*Siriella intermedia*, Gourret, Ann. Mus. Hist. Nat. Mars., iii., 1889, Mem. v., p. 183, Pls. xvii, xviii.

*Survey*.—Blacksod Bay, August 6th, 1890.

Station 145, Killeany Bay, Aran, April 8th, 1891.

Killeany Bay, July 26th, 1890.

*Marine Laboratory*.—Mouth of Killeany Bay, 25th March, 1899; Blacksod Bay, 29th March, 1899; Ballynakill Harbour, 15th May, 1899; Bofin Harbour, August, 1899 (common among weeds, but only one young example in tow-net with *S. Clausii*).

*Museum, Dublin*.—No. 195, 1895. Roundstone.

*Previous Irish Record*.—Valentia Harbour (A. O. W.\*).

*Distribution*.—E. and W. Scotland; Isle of Man; S. and S.W. England (A. M. N.\*): Irish Sea (A. O. W.).

Trieste, Goletta (A. M. N.\*): Marseilles (Gourret): Brittany; Gulf of Lyons (Pruvot): off Vlieland, North Sea (Ehrenbaum). Jersey (A. M. N.\*).

We have recently shown (*Ann. Mag. Nat. Hist.*, s. 7, March, 1899, p. 151) that British records of *S. frontalis* refer in reality to *S. armata*, there being no evidence of the occurrence of the former within the British area. The variability of certain characters, noted in Plymouth examples of *S. armata*, is equally present in Irish specimens.

We believe that *S. intermedia*, Gourret, from Marseilles, is separated by its discoverer from *S. armata* on quite insufficient grounds. The least unimportant distinction that we can discover in the text is the relative shortness of the rostrum; but this disappears in the light of Gourret's own remark (*op. cit.*, p. 182) that Marseilles examples of *S. armata* have a shorter rostrum than is figured by Sars.

Pruvot, who enumerates in his list both *S. armata* and *Mysis Griffithsiae*, Bell, may intend thereby to convey the intimation that he rejects Norman's view of the identity of these species with each other. On the other hand the entry may be no more than evidence of carelessness of compilation.

Sub-family.—GASTROSACCINÆ.

Genus *Gastrosaccus*, Norman.

*Gastrosaccus spinifer* (Goës).

*Survey*.—Station 223, Loughrosmore Bay, 9 to 4 fathoms, sand. May 21st, 1891.

*Marine Laboratory*.—Blacksod Bay, 29th March, 1899.

*Museum, Dublin.*—No. 195, 1895. Roundstone.

*Previous Irish Records.*—Port Magee entrance, Valentia Harbour (A. O. W.\*): at surface, off N. and N.E. Ireland (Herdman).

*Distribution.*—E. and W. Scotland; Whitby; Starcross (A. M. N.\*): Dogger Bank (T. S.): Irish Sea (A. O. W.).

Sweden; Denmark; mouth of the Seine (A. M. N.\*): Heligoland, coasts of Germany and S. Norway (Ehrenbaum): Channel Islands (Walker and Hornell).

**Gastrosaccus sanctus** (Van Beneden).

*Survey.*—Station 145, Killeany Bay, Aran. April 8th, 1891.

*Marine Laboratory.*—Mouth of Killeany Harbour, 25th March, 1899; off Bofin Harbour, 17 fathoms, 17th July, 1899; Bofin Harbour, 4th and 5th August, 1899, common in surface tow-nets at night, but only one specimen found, in a bottom net, during the day time.

*No Previous Irish Record.*

*Distribution.*—Irish Sea (A. O. W.): Plymouth (W. Garstang!): Jersey (A. M. N.\*).

Belgium; Boulogne; Naples; Goletta (A. M. N.\*): Black Sea; Sea of Azov (Sowinski, 1894, 1895).

Most of the specimens from Bofin have practically no trace of the upturned processes of the hind margin of the carapace, though agreeing in other respects with the type. The same peculiarity has been observed in material from Plymouth, and appears to require further attention.

Genus **Haplostylus**, Kossmann.

This genus is distinguished from *Gastrosaccus* by the rudimentary condition of the inner branch of the third pleopod of the male. Forwardly directed lobes of the posterior margin of the carapace are invariably absent.†

**Haplostylus Normani** (G. O. Sars).

*Gastrosaccus Normani*, G. O. Sars, *et auct.*

*Not in the Survey Collection.*

*Irish Record.*—Off Valentia (A. M. N.\*).

*Distribution.*—Rockall (A. M. N.\*). Plymouth.  
Mediterranean (A. M. N.\*).

† We are indebted to Mr. W. T. Calman for the reference on which our diagnosis is founded.

Genus **Anchialus**, G. O. Sars.

**Anchialus agilis**, G. O. Sars.

*Survey.*—Station 118, Ballinskelligs Bay, 32 to 28 fathoms, soft mud. August 21st, 1890.

Station 121a, off Ballycottin, 41 fathoms, sand. August 28th, 1890.

*No Previous Irish Record.*

*Distribution.*—Plymouth (A. M. N.\*!).

Naples; Messina (A. M. N.\*): Channel Islands (Walker and Hornell).

Sub-family.—**HETEROMYSINÆ.**

Genus **Heteromysis**, S. I. Smith.

**Heteromysis formosa**, S. I. Smith.

*Not in the Survey Collection.*

*Irish Record.*—Valentia Harbour, shore (A. O. W.\*).

*Distribution.*—Firth of Forth, Guernsey (A. M. N.\*). Plymouth (W. Garstang!).

Norway; coast of United States (A. M. N.\*).

Sub-family.—**LEPTOMYSINÆ.**

To include a new-comer, *Parerythrobs obesa*, G. O. Sars, Norman's synopsis of this sub-family may conveniently be altered by substituting "*Male with at least the second to fifth pairs of pleopods greatly developed and adapted for swimming,*" for "*male with all the pleopods, etc.*"

Genus **Erythrobs**, G. O. Sars.

**Erythrobs serrata**, G. O. Sars.

*Survey.*—Station 115, off the Skelligs, 62 to 52 fathoms, mud and sand. August 20th, 1890.

Station 143, west of Inishmore, Aran, 46 to 44 fathoms. April 7th, 1891.

Station 125, 40 miles west of Bolus Head, 115 fathoms. March 23rd, 1891.

The contents of the surface and bottom tow-nets of Station 125 were accidentally mixed. Obvious derivatives of the bottom are sand, small crabs, and bivalve shells. Two much-damaged Schizopods are almost certainly also from the bottom. One of them, a headless, limbless, and macerated specimen, with a broken telson, is

only recognisable from one of the inner uropods, which has the inner margin finely serrulated throughout. This character appears to be confined to *E. serrata*. In other respects the uropod conforms equally to this species.

*Previous Irish Records.*—Off Valentia, 80 to 100 fathoms (A. M. N.\*): Mr. A. O. Walker has recorded the species from Station 115, having no doubt received specimens accidentally mixed with Amphipods, etc., from the same haul.

*Distribution.*—Shetland; Moray Firth; Firth of Forth (A. M. N.\*): Loch Fyne (T. S.): Irish Sea (A. O. W.).

Norway, 30 to 200 fathoms (G. O. S.): Denmark (A. M. N.\*).

It would appear, from the examination of Irish specimens, that existing descriptions of this species require modification. We find that the serrulation of the inner uropod, a character hitherto held to be of unreservedly specific value, is by no means constant; but is, in fact, practically confined to females and immature males.

In females, of which thirty were examined, the serrulation was invariably well-marked.

In the male it appears to be lost with maturity, as testified by the perfection of the pleopods, and particularly by the full development of the setæ of the copulatory process of the antennule.

Thus, of fifty-six males, twenty-four are devoid of serrulation on the inner uropods, and twenty of these, in which the antennules remain uninjured, have the setæ fully developed.

The remaining thirty-two males have the inner uropod serrulated; in twenty-five the setæ of the antennule are undeveloped; in two the setæ are minute; in one the setæ are about half-grown. In the remaining four the antennules are not available. A length of 10 mm., from the tip of the antennal scale to the extremity of the uropod, approximately represents, for our specimens, the greatest length of males with serrulated uropods.

We considered it possible that the above remarks might be of purely local application, the absence of serrulation being a racial, rather than a specific, character. Sars' figures (Monogr. over Mysider, Tab. II.) could not be taken as evidence, since it was not certain that the serrulated uropod of his figure 11 was taken from the same individual of which the anterior parts, with fully developed setæ, are shown in his figure 10. However, we have since found in the Museum some specimens of *E. serrata* from the Asbjornsen collection, which appear to have been named by Professor Sars himself. One of them is a mature male, and its inner uropods are as innocent of serrulation as in the case of examples from the West of Ireland. The Asbjornsen specimens are from Lofoten. (See Note, p. 250.)

It is possible that these facts are quite familiar to Professor Sars, but if he has published any modification of his original diagnosis, it has escaped our notice.

Genus **Parerythrops**, G. O. Sars, Monog. over Mysider, Pt. I., nec Pt. III.

**Nematopus**, G. O. Sars.

*Eyes* short, not flattened, nearly globose, remote from each other; pigment of dull fulvous colour, not soluble in spirits. *Antennal scale* very short; external margin not ciliated, terminating in a spine-point. *Legs* of moderate length, rather robust; tarsus of (about?) three articulations, besides the stout nail. *Telson* elongate, sub-triangular; lateral margins entire; apex narrowly truncate, beset with four slender spines and two setæ. *Pleopods* in female small, simple; in male first pair small, simple; remaining pairs biramous, natatory. (Abbreviated from G. O. Sars.)

**Parerythrops obesa**, G. O. Sars.

Pl. XVI., figs. 2, 3.

**Parerythrops obesa**, G. O. Sars, Carcinolog. Bidrag. Norg. Faun., I.  
Monog. over Mysider, 1870, p. 41.

*Carapace* of about equal horizontal width throughout, the greatest width being much more than half the length; anterior margin produced so as to form nearly a right angle. *Pleon* less than half as wide as cephalothorax, its last segment longer than the others. *Eyes* large, sub-globose; internal margin but slightly emarginate. *Antennule*, peduncle a little longer than the eye; its distal articulation longer than the united length of the two proximal. *Antennal scale* a little longer than peduncle of antennule, sub-rhomboidal, about three times as long as wide; outer margin terminating in a spine, beyond which the linguiform apex is produced so as to occupy nearly half the length of the scale. *Telson* nearly equal in length to the last segment of abdomen; elongate, sub-triangular, greatest width much less than length; lateral margins nearly straight; apex very narrow, squarely truncate; outer pair of terminal spines not half as long as the inner pair. *Uropods*, outer about one-third longer than inner; the latter with about 20 strong spines occupying the greater part of its inner margin. *Pigment* of adult bright red. *Length* of adult female about 13 mm., of male about 14 mm. (After G. O. Sars.)

*Survey*.—Station 115. Off the Skelligs, 62 to 52 fathoms, mud and sand. August 20th, 1890.

*No Previous British Record.*

*Distribution*.—Norway; Lofoten; Finmark, 30 to 200 fathoms (G. O. S.).

The species is added to the British Fauna on the evidence of a single female, so much battered that some of the generic characters cannot be observed. The telson, however, remains available, and is of a form only met with, so far as we know, in the genera *Parerythrops* and *Metererythrops* (*vide* figs. 2, 3).

In distinguishing between the three known species, *P. obesa*, *M. robusta*, S. I. Smith, and *P. abyssicola*, G. O. Sars, the small size of the eyes in the last named is a very obvious character. The two first have large eyes of about the same size and form. So far as we can determine, in the absence of the adjacent appendages, and from the defective condition of the cephalothorax, the eyes in our specimen are too large to permit of its being assigned to *P. abyssicola*. Moreover, the outline of the faceted area agrees, on the testimony of Sars' figures, rather with *P. obesa* than with *P. abyssicola*. While in other characters the latter closely resembles *P. obesa*, *M. robusta* differs from either in having a much more elongate telson. In our specimen it is about equal to the last segment of the abdomen; in *M. robusta* it is about one-third as long as the entire pleon. Minor differences observed by Sars in the characters of the antennules, antennal scales, and legs are of no use to us, as our specimen has lost all these appendages.

*P. obesa* and *P. abyssicola* are not separated by any very well-marked characters of the telson, but, although the lateral margins of this structure are rather more curved than in Sars' figure of *P. obesa*, they agree with that species rather than with *P. abyssicola*. The proportions of the terminal spines are also in harmony with *P. obesa* rather than with *P. abyssicola* (*cf.* Sars, *op. cit.*, Pl. III., fig. 18, Pl. xxviii., figs. 9, 10, Pl. xxix., figs. 7, 8).

The single inner uropod which remained entire in our specimen was broken in manipulation, but has been carefully reconstructed by Mr. Green (fig. 3). At present it has fewer spines than in any of Sars' species, but some have almost certainly been broken off.

#### Genus *Mysidopsis*, G. O. Sars.

#### *Mysidopsis didelphys* (Norman).

*Survey*.—Station 115. Off the Skelligs, 62 to 52 fathoms, mud and sand. August 20th, 1890.

Station 125. 40 miles west of Bolus Head, 115 fathoms. March 23rd, 1891.

We have already mentioned, under *E. serrata*, the accidental mixing of the contents of the bottom and surface nets of Station 125. The bottle contains a mangled specimen, apparently a *Mysidopsis*, and probably referable to this species. The total length is about 7 mm. The cephalo-thoracic shield is displaced; the trunk is much macerated; the legs have disappeared, except the

exopodite of one. The eyes are large, of a pale reddish colour. What remains of one antennal scale has the characters of the genus. The pleopods are simple. The telson is broken off rather short, but the proximal spines of the lateral margins are rather few, as in *M. didelphys* rather than *M. angusta*. There is a single spine on the ventral side of the otocyst, a character common to these two species. The size of the eyes, the lateral margins of the telson, and the somewhat robust form of the whole animal are sufficient, as we think, to justify our determination.

From Station 115, in addition to sixteen mature and half-grown specimens, we have two which are quite small. They can be referred without difficulty to the same species as the larger ones, and serve, by comparison, to confirm our determination of the mangled example from Station 125. *M. didelphys* is recorded by Sars from 50 to 150 fathoms, whereas *M. angusta* has not yet been taken below the 50 fathom line.

*Previous Irish Record.*—Off Valentia (A. M. N.\*).

*Distribution.*—Shetland; Firth of Clyde; Loch Fyne; Moray Firth; Firth of Forth; off Tynemouth (A. M. N.\*).

Norway; Denmark (A. M. N.\*).

#### ***Mysidopsis gibbosa*, G. O. Sars.**

*Survey.*—Station 118, Ballinskelligs Bay, 32 to 28 fathoms, soft mud. August 21st, 1890.

*Marine Laboratory.*—Fahy Bay, Ballynakill, 5th March and 18th May, 1899.

*Museum, Dublin.*—No. 195, 1895. Roundstone.

*Previous Irish Records.*—Valentia (A. M. N.\*): Valentia Harbour (A. O. W.\*).

*Distribution.*—Loch Fyne; Firth of Forth (A. M. N.\*): Plymouth (W. Garstang!); Start Bay; Irish Sea, Port Erin (A. O. W.).

Norway; Denmark; Mediterranean (A. M. N.\*).

#### ***Mysidopsis angusta*, G. O. Sars.**

*Survey.*—Station 118, Ballinskelligs Bay, 32 to 28 fathoms, soft mud. August 21st, 1890.

Station 148, 7 miles S.S.W. of Gregory Sound, Aran, 38 fathoms, sand. April 9th, 1891.

*Previous Irish Record.*—Valentia Harbour (A. O. W.\*).

*Distribution.*—E. and W. Scotland (A. M. N.\*): Dogger Bank (T. S.): Start Bay, and off Plymouth.

Norway; Naples (A. M. N.\*).

*Mysidopsis hibernica*, Norman.

Pl. xvi., figs. 4, 5.

*Survey.*—Station 115, off the Skelligs, 62 to 52 fathoms, mud and sand. August 20th, 1890.

*Previous Record.*—Valentia (A. M. N.\*).

The species has hitherto been known from a pair of examples captured by Norman in Dr. Jeffrey's yacht "Osprey," at Valentia in 1870. No note was made of the "circumstances as to the depth, etc.," under which they were obtained, so that our record furnishes the first exact information on this point. The length is given by Norman as 15 mm. Our solitary example is considerably smaller; and, if only young examples were present at the time we were fishing, many may have escaped through the meshes of the mosquito-net bag. As usual, the anterior appendages are rather defective, the antennal scales having disappeared, and the antennules being more or less denuded of setæ. Hence the characters of these appendages are not available for specific diagnosis. The telson and the inner uropod (figs. 4, 5) are, as we think, in sufficiently close agreement with Norman's diagnosis (*Ann. Mag. Nat. Hist.*, s. 6, October, 1892, p. 165, pl. ix., figs. 2, 3, 4) to warrant us in referring the specimen to *M. hibernica*. It will be noticed, however, that the apex of the telson diverges slightly from the type. In Norman's figure there is shown but a slight emargination of the posterior border between the inner pair of terminal spines, whereas Mr. Green's drawing shows that the Skelligs specimen has a distinct notch in this position; while the terminal spines (the longer of which have lost their points) are by no means symmetrical. Slight variations and abnormalities of this structure must be quite familiar to every student of the family. If Norman's figures 2 and 3 (*loc. cit.*) are drawn to the same scale, the telson must, relatively to the length of the inner uropod, be rather shorter in the Skelligs example than in the type. We believe that we have evidence, from the analogy of other members of the family, that such a difference is often explicable by the size of the specimens, the length of the telson tending to increase with age. In our specimen the lateral margins of the telson have fewer spines than are shown in Norman's figure, as, indeed, might be anticipated from its small size (*cf.* especially *Schistomysis spiritus*).

The typical structure of the telson cannot be held to be certainly known until more specimens have been examined. Although the asymmetry of the Skelligs example suggests abnormality, it is quite possible that a notch in the posterior border is more usual than a simple emargination.

Genus *Leptomysis*, G. O. Sars.

*Leptomysis gracilis*, G. O. Sars.

*Survey*—Station 118. Ballinskelligs Bay, 6 fathoms, sand. 21st August, 1890.

Station 121a. Inside the Nymph Bank, off Ballycottin, 41 fathoms, sand. 28th August, 1890.

Station 130. Kenmare river, off Sneem, 24 fathoms, mud. 30th March, 1891.

*No Previous Irish Record.*

*Distribution.*—E. Scotland; Shetland (A. M. N.\*): Plymouth (W. Garstang!).

Norway; Boulonnais, France (A. M. N.\*): North Sea, central parts (Ehrenbaum).

*L. gracilis* does not figure in Walker's records from the Irish Sea, so that a considerable gap occurs in the recorded distribution of this species on the British coasts. On the south and east coasts of England the gap is possibly due to want of observation, but it is much less likely that any Schizopod, abundant on the W. coast of England and Scotland, should escape the attention of Mr. Walker and Mr. Thomas Scott.

An abnormal example in the Irish collection has one large median terminal spine on the telson, and two large postero-lateral spines, which each appear to have been separated from the median by one (possibly two) small spines, now missing. Many lateral spines have been lost by the telson, and the antennal scales are imperfect, but the hispid skin and characteristic rostrum sufficiently associate the specimen with *L. gracilis*.

*Leptomysis mediterranea*, G. O. Sars.

*Survey*—Station 145. Killeany Bay, Aran. 8th April, 1891.

A single specimen, 18 mm. long, caught in a small calico trawl. The large number of setæ on the distal joints of the antennal scales is noteworthy = 12 on the internal, 16 on the external border.

*Marine Laboratory.*—Mouth of Killeany Bay, 25th March, 1899.

*No Previous Irish Record.*

*Distribution.*—Channel Islands; Starcross, Devon (A. M. N.\*): Plymouth (W. Garstang!).

Spain; Mediterranean (A. M. N.\*): Heligoland (Ehrenbaum).

*Leptomysis lingvura*, G. O. Sars.

*Leptomysis Marioni*, P. Gourret, "Revision d. Crust. podophthalm. Golfe de Marseille."—Ann. Mus. Hist. Nat. Marseille, III., 1889, Mem. v., p. 185; pl. xviii., figs. 8–14. X

*Survey*.—Station 118. Ballinskelligs Bay, 32 to 28 fathoms, soft mud. 21st August, 1890.

*Museum, Dublin*.—No. 195, 1895. Roundstone.

*Previous Irish Records*.—Lough Kay, Valentia; Dingle Bay (A. O. W.\*).

*Distribution*.—Firth of Forth (T. S.): Loch Fyne; Northumberland; Durham; Starcross (A. M. N.\*): Irish Sea, Port Erin and Colwyn Bay (A. O. W.): Plymouth.

Norway; Boulonnais; Mediterranean; Black Sea (A. M. N.\*): N.-W. France (Pruvot. *L. Marioni*).

While *Leptomysis sardica* (G. O. Sars) is considered by Norman to be merely a small race of *L. lingvura*, it would appear, from the remarks of the same observer, that typical examples of the latter occur in the Mediterranean (Adriatic), as well as in the Atlantic. We see no reason to doubt the accuracy of Norman's views as to the identity of the two species.

We further believe that *L. Marioni*, of Gourret, is not to be distinguished from *L. lingvura* by any characters of specific moment. It does not appear that the author was acquainted with Sars' Norwegian monograph, nor is it certain that the distinctions which are drawn between *L. sardica* and *L. Marioni* are based on the examination of a series of the latter sufficiently numerous to eliminate the probability of the occurrence of intermediate varieties. *L. sardica* appears to have been known to Gourret only from the figures of Sars, and in the case of an appendage not figured for *L. sardica*, comparison has been somewhat futilely instituted with *L. mediterranea*. The mandible is figured and compared with that of *L. mediterranea*, as figured by Sars. The difference would be the more remarkable if Gourret's drawing were not obviously taken from a specimen distorted in manipulation. In the position in which they are shown the anterior denticulations of the cutting edge have no very obvious function. We have examined the mandibles of *L. lingvura*, and consider it possible that Gourret's figure 8, pl. xviii., may have been based on a distorted appendage of similar structure. The anterior denticulations, though very different in position, are not widely dissimilar from those of *L. Marioni* (as figured). The distinctive characters of the outer process of the antennule in *L. Marioni* do not appear to us of much importance, and, in so far as concerns the length of the first joint of the process, Gourret's species would seem to resemble *L. lingvura*.

We suppose that a comparison of the first maxillæ of *L. Marioni* and *L. sardica* contains a clerical error, whereby the latter species has been substituted

for *L. mediterranea*, since Sars neither figures this appendage of *L. sardica* nor includes a description of it in the diagnosis of the species.

With regard to the second maxilla *L. mediterranea* is the species selected for comparison. The differences noted as distinguishing *L. Marioni* are less strongly marked, as far as Gourret's figure appears from the whole context to be reliable, when the last-named species is compared with *L. lingvura*. The outer processes (fouets) of the second maxillæ of a specimen examined are somewhat conical, and have but few marginal setæ.

The maxillipeds are stated to differ slightly from those of *L. mediterranea*, but in the case of the second pair such difference appears only to bring them more into conformity with *L. lingvura*.

The inner uropod of *L. Marioni*, if notably different from that of *L. sardica*, is certainly distinguishable from that of *L. lingvura* in no important particular.

The spinulation of the telson in *L. Marioni* is undoubtedly different from that which typically obtains in *L. lingvura*. In the latter there are two (in *L. sardica* three) small median spines, bordered by a large spine on each side. Each large spine is separated laterally from another large spine by three (in *L. sardica* four) smaller ones. In *L. Marioni* there are eight small median spines, of which the two most central are rather larger than the rest. Lateral to these on either hand are two large spines separated by seven smaller ones. The difference in size between the larger and smaller spines is much greater in *L. Marioni* than in *L. lingvura*; and the distinction between the two forms in this particular is, in effect, that the four large spines of the extremity of the telson are separated by more numerous and smaller spinules in *L. Marioni* than in *L. lingvura*.

The analogy of other forms, notably *Siriella armata*, inclines us to distrust most strongly the specific value of such a distinction, based on the examination of an unknown and possibly small number of examples; the more especially since the supposed differences in other parts appear altogether trivial, not to say illusory. *L. Marioni* may therefore be relegated, for the present, to the synonymy of *L. lingvura*, or may, at most, be held to be a race of the latter characterised by difference of the number of spinules on the terminal portion of the telson.

Sub-family.—MYSINÆ.

Genus *Hemimysis*, G. O. Sars.

*Hemimysis Lamornæ* (Couch).

*Not in the Survey Collection.*

*Marine Laboratory.*—Blacksod Bay, 6–8 fathoms, 29th March, 1899. Two specimens, pigment bright red.

*No Previous Irish Record.*

*Distribution*.—Falmouth; Plymouth; Seaham; N. Wales; E. and W. Scotland (A. M. N.\*).

Norway; Sweden; Denmark; Naples; Black Sea (A. M. N.\*).

Genus **Macropsis**, G. O. Sars. (See Note added in Press, p. 250.)

Genus **Macromysis**, A. White.

**Macromysis flexuosa** (Müller).

*Not in the Survey Collection.*

*Marine Laboratory*.—Aran; Blacksod Bay; Ballynakill; Inisbofin; 1899.

*Museum, Dublin*.—No. 85, 1893, Bantry Bay, per A. R. C. Newburgh.

No. 122, 1892, Bantry Bay.

No. 122, 1892, Dunbeacon Harbour, Bantry Bay.

No. 122, 1892, S.W. of Ireland.

Unregistered. Dunbeacon Harbour; Broadhaven, 1873; Merrion, Co. Dublin, per G. Y. Dixon.

*Previous Irish Records*.—"All our coasts" (A. M. N.\*).

*Distribution*.—British coasts.

Atlantic coasts of the European continent; Baltic; Black Sea (?), (A. M. N.\*).

Of all British Mysidæ with which we are acquainted, the genus *Macromysis* appears to present the greatest difficulty in the determination of the species, on account of the unsatisfactory nature of the characters by which *M. flexuosa* and *M. neglecta* have been separated by Sars and Norman. Were it not for the high authority of these observers, we might be inclined, with little ceremony, to relegate one species to the synonymy of the other, a proceeding hardly justified by our experience of the family. We must, however, admit that we have never seen a really typical specimen of *M. neglecta* as redefined by Norman. The distinctive characters of the two may be summarised (from Norman) as follows:—

*M. neglecta.*

*Antennal scale*.—Ca. 5 times as long as broad; not twice the length of peduncle of antennule; apex extending twice the length of spine of external margin.

*Tarsus*.—5-articulate, last 4-articulate.

*Telson*.—Cleft  $\frac{1}{2}$  of total length, very narrow and constricted at base; 18 to 20 lateral spines.

*Length*.—20 mm.

*M. flexuosa.*

7 to 8 times as long as broad; more than twice the length of peduncle of antennule; apex scarcely extending beyond spine.

6-articulate, last 5-articulate.

Cleft  $\frac{1}{3}$  of total length, moderately open; 21 to 27 lateral spines.

25 mm.

The above characters, if constantly found associated in individuals, would certainly enable us to name specimens either *M. flexuosa* or *M. neglecta*, leaving to higher authorities the task of deciding whether or no the somewhat minute differences enumerated were really of specific moment. However, in the Irish examples, the characters prove to be mixed in individuals or compromised by the occurrence of intermediate conditions.

The number of joints in the tarsus has the appearance, on paper, of a well-defined character, and it may be easy for an expert to count the joints in all examples. We ourselves have often experienced the greatest difficulty in this matter, since the proximal articulation is often so faintly indicated, even under a moderately high power, that it is impossible to decide whether it is entitled to rank. Moreover, the number of joints often varies in the anterior legs of the same individual, as may be seen by the following figures:—

*Articulations of tarsus of legs, from in front backwards.†*

Specimen.	Specimen.
A. 6, 6, 6, 5, 5, 4.	I. 5, 5, 6, 5, 5, 4.
B. 5, 5, 6, 5, 5, 4.	J. x, x, $\frac{6}{6}$ ,* x, 5 (?), $\frac{4-5}{4}$ (??).
C. 5, 6, 6, 6, 5, $\frac{5}{5}$ .	K. An anterior leg, 4.
D. 5-6 (?), x, $\frac{6}{6}$ , 6, 6, 5.	L. $\frac{5}{5}$ , $\frac{5}{5}$ , x, x, 5, 4.
E. 5, $\frac{5-6}{6}$ (?), 6, 5-6 (?), 5, 4-5 (??).	M. 4-5 (?), 5, 5, 5, 5 (?), $\frac{4}{4}$ .
F. 5, 5-6 (??), 5-6 (?), 5, 5, 4.	N. x, 5, a leg anterior to last 4.
G. 5, 6 (?), 6 (?), 5, 5 (?), 4.	

If the presence of a sixth articulation is a crucial point of distinction, A to J must be *M. flexuosa*, while L to N are *M. neglecta*. The specimens are enumerated in the order of size, A to K measuring 24 to 15 mm. (including antennal scales and telson); L to M 13 to 12 mm. In the case of *Schistomysis ornata*, Norman, in deciding *P. Kervillei* to be a synonym of the first-named species, attaches no importance to the extra joint of the tarsus present, but apparently not invariably, in large specimens. We cannot see why the character should have greater value in *Macromysis*, in which, indeed, we have given some little evidence that the number of joints may increase with the age or size of the specimen; although since M and N are fully developed males, it be not correlated to sexual maturity.

† Two figures separated by a hyphen and followed by a note of interrogation indicate that the existence of the larger number of articulations (six in 5-6 ?) is doubtful. The doubt is greater where two notes of interrogation are employed. A single figure followed by a note of interrogation means that the proximal articulation was observed, but only indistinctly formed. Figures shown as fractions ( $\frac{5}{5}$ ) refer to a pair of legs.

The relations of the antennal scale to the peduncle of the antennule give results as follows:—A. antennal scale fully double the length of the peduncle of the antennule; C. distinctly more than double; D. about double; E. barely double; F. somewhat less than double; G. barely double; H. about double; I. distinctly less than double; J. scales both perfect, but of unequal length: the longer one about double the length of the peduncle of antennule; K. slightly less than double; M. slightly less than double; N. distinctly less than double.

The relative length and breadth of the scale can only be ascertained by isolating this appendage. In the few cases in which this has been done, the breadth has proved to be about one-sixth of the length. Such a proportion is intermediate between the conditions of *M. flexuosa* and *M. neglecta*. In shape, on comparison with Sars' figures, the antennal scale appears to incline to the condition of the last-named species. Specimens C and D have the apex of the scale as in *M. flexuosa*; in A the shape is intermediate; in B and K the scale is imperfect; in the remaining specimens the shape approaches *M. neglecta*. But, as far as one can judge without detaching the scale, the width is in all cases intermediate.

At what point of constriction the cleft of the telson may be held to incline to one species rather than to the other is difficult to decide, but comparison with Sars' figures appears to range our examples as follows (the fraction indicates the length of the cleft in the total length of the telson):—

A. ca. $\frac{1}{5}$ . " <i>neglecta</i> ";	F. $\frac{1}{5}$ . " <i>neglecta</i> ";	K. $\frac{1}{6}$ . " <i>flexuosa</i> ";
B. ca. $\frac{1}{5}$ . " <i>neglecta</i> ";	H. intermediate;	L. $\frac{1}{7}$ . " <i>flexuosa</i> ";
C. $\frac{1}{5}$ to $\frac{1}{6}$ . " <i>neglecta</i> ";	I. $\frac{1}{6}$ ;	M. $\frac{1}{5}$ ;
E. $\frac{1}{6}$ . " <i>flexuosa</i> ";	J. $\frac{2}{11}$ ( $\frac{1}{6}$ );	N. ca. $\frac{1}{5}$ . " <i>flexuosa</i> ."

The lateral spines of the telson are:—

A. $\frac{20}{21}$ ;	E. 21;	H. 22;	K. 22;	N. $\frac{20}{21}$ .
B. 24;	F. $\frac{23}{23}$ ;	I. $\frac{24}{24}$ ;	L. $\frac{20}{21}$ ;	
C. 22;	G. $\frac{21}{22}$ ;	J. $\frac{20}{21}$ ;	M. $\frac{20}{23}$ ;	

The preceding details may be summed up in a table showing to which species the individuals incline in the characters of different parts.

	Length in mm.	Tarsus.	Antennal scale compared with peduncle of antennule.	Shape of antennal scale (not width).	Length of cleft of telson.	Shape of cleft of telson.	Lateral spines of telson.
A. ♀	24	"flex."	intermed.	intermed.	"negl."	"negl."	intermed.
B. ♀	23	"flex."			"negl."	"negl."	"flex."
C. ♀	23	"flex."	"flex."	"flex."	intermed.	"negl."	"flex."
D. ♀	22	"flex."	intermed.	"flex."			
E. ♀	18	"flex."	"negl."	"negl."	"flex."	"flex."	"flex."
F. ♀	18	"flex."	"negl."	intermed.	"negl."	"negl."	"flex."
G. ♀	17	"flex."	"negl."	"negl."			"flex."
H. ♀	16		intermed.	"negl."		intermed.	"flex."
I. ♀	16	"flex."	"negl."	"negl."	"flex."		"flex."
J. ♀	15	"flex."	"negl."		"flex."		intermed.
K. ♂	14	"negl."(?)	"negl."	"negl."	"flex."	"flex."	"flex."
L. ♀	13	"negl."			"flex."	"flex."	intermed.
M. ♂	12	"negl."	"negl."	"negl."	"flex."	"negl."	intermed.
N. ♂	12	"negl."(?)	intermed.	"negl."	"flex."	"negl."	intermed.

The net result appears to us to prove that if *M. flexuosa* and *M. neglecta* have been rightly separated, their distinctive characters have been very imperfectly defined. As the species stand at present, the Irish examples which we have seen are typical of neither. Two characters, those of the tarsus and of the lateral spines of the telson, are almost certainly variable with the size of the example.

#### **Macromysis neglecta** (G. O. Sars).

As appears from our remarks under the preceding, we have great doubts as to the validity of this species.† Our doubts appear to be shared by Ehrenbaum. Specimens have been recorded under this name as follows:—

*Irish Record.*—Valentia Harbour (A. O. W.\*).

*Distribution.*—Loch Fyne; Starcross; Plymouth; North Wales; Guernsey (A. M. N.\*); Irish Sea (A. O. W.).

Norway; Denmark (A. M. N.\*): Heligoland (Ehrenbaum).

† In the museum are four specimens from the Asbjornsen collection (Christiania) named by Professor Sars. We have examined them in so far as was possible without isolating the appendages. They consist of two males, 16 and 17 mm. *ca.*, including antennal scales and uropods, and two females, 17 and 20 mm. In each of the four we have found at least one leg with the tarsus 6-articulate. The two males have 22 lateral spines on the telson, a number in excess of that assigned to the species by Norman, but perhaps,

**Macromysis inermis** (Rathke).

*Not in the Survey Collection.*

*Marine Laboratory.*—Inisbofin Harbour, 4th and 5th August, 1899, surface townet at night. Young examples, apparently referable to this species.

*Irish Record.*—Valentia Harbour (A. O. W.\*).

*Distribution.*—Shetland; east and west coasts of Scotland; Northumberland; Plymouth (A. M. N.\*); North Wales; Isle of Man (A. O. W.).

Norway; Sweden; Denmark; Baltic; Murman Sea; Spitzbergen (A. M. N.\*): Heligoland (Ehrenbaum).

Genus **Schistomysis**, Norman.**Schistomysis spiritus**, Norman.

*Survey.*—Station 115, off the Skelligs, 62 to 52 fathoms, mud and sand. August 20th, 1890.

Station 223, Loughrosmore Bay, Co. Donegal, 9 to 4 fathoms, sand. May 21st, 1891.

*No Previous Irish Record.*

*Distribution.*—Shetland; Durham; Banff; Firth of Forth; Jersey (A. M. N.\*): Plymouth (W. Garstang!); Irish Sea, Puffin Island (A. O. W.).

Norway; North Sea; Denmark; Holland; Boulogne, France (A. M. N.\*).

The gathering from Station 223 contains a specimen of 10 mm., and a number of smaller immature forms. The spines of the inner uropod, in the latter, are comparatively few in number and consequently much less crowded than in the adult condition. In the specimen of 10 mm. (and in one of 12 mm. from Plymouth) the spines are still less dense than in the adult, but have the characteristic arrangement. Other characters, which need not be detailed, leave no doubt as to the specific determination.

**Schistomysis ornata** (G. O. Sars).

*Survey.*—Station 118, Ballinskelligs Bay, 32 to 28 fathoms, soft mud. August 21st, 1890.

Station 121a, inside the Nymph Bank, off Ballycottin, 41 fathoms, sand. August 28th, 1890.

Station 130, Kenmare River, off Sneem, 24 fathoms, mud. March 30th, 1891.

covered by Sars' diagnosis (20 ca.). We have compared the otolith of the larger specimen of each sex with that of a *M. flexuosa* from Christiania Fjord, and are unable to detect any proportional difference in size. In so far as concerns the characters of the antennal scales, and of the cleft of the telson, the determination appears to be in harmony with the descriptions of the two species.

Station 148, seven miles S.S.W. of Gregory Sound, Aran, 38 fathoms, sand. April 9th, 1891.

*Marine Laboratory.*—Blacksod Bay, 6–8 fathoms, 29th March, 1899. Numerous examples, divergent in some characters from the type. We have observed the same peculiarity in specimens from the estuary of the Tamar, and propose to revert to the matter on a future occasion.

*Previous Irish Records.*—Off Valentia (A. M. N.\*): Port Magee entrance, Valentia Harbour, 15 fathoms (A. O. W.\*).

*Distribution.*—Shetland; east Scotland; Durham; Liverpool Bay (A. M. N.\*): Irish Sea (A. O. W.): Dogger Bank (T. S.): off Plymouth and Tamar estuary.

Norway; Denmark; Holland; N. W. France (A. M. N.\*): Baltic, North Sea (Ehrenbaum).

#### *Schistomysis arenosa* (G. O. Sars).

*Not in the Survey Collection.*

*Marine Laboratory.*—Off the White Strand, Ship Sound, Inisbofin, 2–5 fathoms, 20th and 22nd July, 1899, very abundant.

*No Previous Irish Record.*

*Distribution.*—Starcross, Devon (A. M. N.\*): Plymouth (W. Garstang!): Mediterranean (A. M. N.\*).

#### Genus *Mysis*, Latreille.

#### *Mysis relicta*, Lovén.

*Museum, Dublin.*—Lough Neagh, near mouth of Antrim river, per Dr. R. F. Scharff.

*Previous Irish Record.*—Lough Neagh (A. M. N.\*). *Mysis chamæleon*, recorded by Bell, on the authority of W. Thompson, from the stomachs of pollen in Lough Neagh, can only be referable to this species.

*Distribution.*—Lakes Venern, Vettern, Malar, etc., Sweden; Lake Mjosen, Norway; Lake Onega, Russia; Lake Ladoga, Putko, etc., Finland; northern part of Gulf of Bothnia; Lakes Michigan and Superior, in America (A. M. N.\*).

Lough Neagh appears to be regarded by geologists as due to a comparatively late subsidence of the basalt of the Bann valley, but the exact period is disputed. It may be presumed that *M. relicta* did not enter the Lough by the navigation canal; it certainly cannot have ascended the Bann, which is in places much too rapid to permit of such an achievement. The most closely allied marine species is *M. oculata*, the sub-Arctic habitat of which is perhaps of some importance in considering the age of the Lough.

Genus *Neomysis*, Czerniavsky.*Neomysis vulgaris* (J. V. Thompson).

*Not in the Survey Collection.*

*Irish Records.*—River Lee, up to Cork and Cove (J. V. Thompson): Belfast Lough (W. Thompson).

*Distribution.*—"All round our coast in brackish water" (A. M. N.\*).

European Atlantic coasts (except Spain and Portugal); Baltic; White and Murman Seas; Black Sea (?) (A. M. N.\*): Bouches du Rhône (A. F. Marion *in litt.*)

*Dasymysis*, gen. nov.

Synon. *Acanthomysis*, Czerniavsky.—*Monogr. Mysid. imprimis Imperii Rossici*, 1882, *Fasc. I.*, p. 134.

*Skin* hispid. *Antennal scale* lanceolate, setiferous on both margins. *Tarsus* with about three articulations and a slender nail. *Telson* linguiform, entire; proximal part of lateral margins naked, or with a few spines near the base; distal parts of margin densely armed with numerous unequal lanceolate spines. In the male, the first, second, and fifth *pleopods* are like those of the female; the third is hardly at all modified; the fourth with a peduncle and two branches, the inner as usual in *Mysinæ*; the outer narrowly cylindrical, somewhat flexuous, bi-articulate, the proximal joint elongate, the distal very short and beset with two short subequal setiform flagella.

*Type.* *Mysis longicornis*, Milne-Edwards.—"Hist. Nat. Crust.," 1837, ii., p. 459, pl. xxvi., figs. 7-9. G. O. Sars—"Middelhav. Mysider," 1877, p. 22, pls. 9, 10, = *Acanthomysis platydens*, Czerniavsky, *op. cit.* p. 137.

The genus *Acanthomysis*, instituted by Czerniavsky, with *M. longicornis* (G. O. Sars) as the type, cannot be retained, since it is stated that the pleopods are as in *Mysis*, the type being thus excluded. The genus *Mysis*, as restricted by Czerniavsky himself, contains the species *M. relictæ*, *M. oculata*, *M. mixta*, and several others of more doubtful value. The three which we have named have the pleopods very different from those of *M. longicornis*. The third pleopod of the male has a well-developed basal joint, and two distinct, if short, branches. The fourth pleopod of the male has the outer branch multi-articulate, and much stouter than in *M. longicornis* (*cf.* G. O. Sars, "Monog. over Mysider," pp. 69,

73, 76, pls. xxxi.–xxxiii.). In so far as the pleopods are concerned *M. longicornis* might be included in the genus *Neomysis*, from which, however, it is distinguished by other characters.

***Dasymysis longicornis* (M.-Edw.).**

*Mysis longicornis*, Milne-Edwards, *loc. cit.*

? *Mysis longicornis*, Heller, "Crust. pod. Südl. Europ.," 1863, p. 302.

*Mysis longicornis*, G. O. Sars, *loc. cit.*

*Acanthomysis platydens*, Czerniavsky, *loc. cit.*

*Acanthomysis longicornis*, Czerniavsky, *op. cit.*, "Fasc. III.," p. 75.

*Acanthomysis spinosissima*, Czerniavsky, *op. cit.*, "Fasc. I.," p. 135, pls. xxxi., xxxii.

*Form* narrow and slender, abdomen nearly straight. *Skin* hispid in all parts. *Rostrum* obtusely angular. *Eyes* large, pyriform, widely separate, extending well beyond the lateral margin of carapace. Peduncle of *antennule* rather elongate, the second joint dorsally produced into a forwardly-directed process; the last joint rather tumid and nearly equal in length to the first. *Antennal scale* but slightly extending beyond peduncle of antennule, narrowly lanceolate in form, its extremity divided from the rest by an oblique suture. *Tarsus* about three-articulate, the proximal articulation the longer, nail slender but distinct. *Telson* elongate, entire; widely dilate at the base, thence suddenly constricted; the posterior part narrowly linguiform, and densely armed at the margin with numerous, unequal, lanceolate, straight or slightly curved spines, their extremities with a distinct axial marking.† *Inner uropod* hardly longer than telson, narrowly lanceolate, base swollen; otocyst oval, large; inner margin in region of otocyst beset with a row of spines of gradually increasing size. *Outer uropod* one-fourth longer than inner, very narrow, with a slight outward curve, apex obliquely truncate. Male, with the fourth *pleopod* not reaching the posterior extremity of the sixth segment. *Length* of female scarcely 9 mm. *Pigment* blackish-brown, not abundant.

*Survey*.—Station 118, Ballinskelligs Bay, 32 to 28 fathoms, soft mud. 21st August, 1890.

*Previous Irish Record*.—None.

† The external chitinous sheath of the spine is suddenly thickened towards the distal end, the lumen being thus reduced in such a way as to present the appearance of an axial line. This character (also present in *L. apiops* (?)) appears to have suggested to Mr. Walker that the extremity of the spine is trigonal.

*Distribution*.—Start Bay, Devon: off Plymouth (E. W. L. H. and W. I. B.). Irish Sea (A. O. W.).

Naples (M.-Edw., G.O.S., Czerniavsky): Algeria(?) (Lucas).

We found this species extremely abundant in Start Bay in 1898,† while later in the same year a single specimen was recorded from the Irish Sea by Mr. Walker.‡ Our present record deals with material collected nine years ago, so that it is improbable that the appearance of the species in British collections is due to a recent extension of range. Mr. Walker speaks of the difficulty of distinguishing this form from *Leptomysis apiops*, G. O. Sars, but the latter has a smooth skin, while that of *D. longicornis* is most conspicuously hispid.

The synonymy of the species is chiefly the result of the misplaced industry of Czerniavsky, who, mistrusting the identity of Sars' species with the imperfectly defined *M. longicornis* of Milne-Edwards, changed the specific name of the former to *A. platydens*, while nevertheless including Milne-Edwards' species in the genus of which Sars' species was made the type. At the same time a new species, *A. spinosissima*, was erected for the reception of specimens, also from the Bay of Naples, which do not appear to us to differ from the type in any essential feature. Since no note is made of the character of the skin in Czerniavsky's dichotomic table (*op. cit.*, p. 137), it may be presumed that *A. spinosissima* is as hispid as *D. longicornis*. In the same table the dimensions of the two species have been transposed, *A. spinosissima* being in fact founded on specimens considerably smaller than those described by Sars. To this difference in size may, perhaps, be ascribed such discrepancies (other than those of slight abnormality of the telson, *cf.* Pl. xxxi., fig. 19) as Czerniavsky was able to detect.

#### Sub-family.—MYSIDELLINÆ.

#### Genus *Mysidella*, G. O. Sars.

*Body* short and robust. *Eyes* well developed or rudimentary. *Antennal scale* small, lanceolate, setose on both margins. *Peduncle of antennule* in male with only a very small hirsute lobe. *Labrum* obtuse in front, produced behind into two unequal lobes. *Mandible* large, the incisive extremity very much dilate and flattened, in the form of a blade without a trace of teeth or spines. *First maxilla*, its processes strongly incurved; the outer large, compressed, sub-spathulate, with obliquely

† *Journ. M. B. A.*, N. S., v., 1898, p. 344.

‡ *Ann. Rep. Port Erin Biol. Stat.*, 1898, p. 15.

truncate edge set with numerous unguiform spines; the inner in the form of a setose tubercle. *Second maxilla* small and feeble. *First maxilliped* strong; basal joint without an incisive lamina, second joint very short, third rather swollen; penultimate without setæ, but strongly spined at the external apex; last joint very small and armed with a long, narrow apical spine. *Legs* small and feeble, sparsely setose; tarsus with few articulations, nail inconspicuous. *Incubatory pouch* of female of three lobes on each side, the anterior pair rudimentary. *Genital appendages* of male very long, anteriorly directed, without setæ. *Pleopods* rudimentary, simple, alike in both sexes. *Telson* short, anterior part of lateral margin naked, posterior part closely spined, a small apical cleft. *Uropods* short, subequal; otocyst well developed. (Abbreviated from G. O. Sars.)

*Mysidella typica*, G. O. Sars.

(Pl. I. [XVI.], figs. 6, 7.)

*Mysidella typica*, G. O. Sars, Carcinolog. Bidrag til Norges Fauna, I. Monogr. Mysider, Hefte III., 1879, p. 86, pls. xxxv., xxxvi.

*Body* rather abbreviate; cephalo-thorax short, sub-gibbous; abdomen much more slender, cylindrical, slightly tapering, last segment short; last two segments of cephalo-thorax exposed dorsally. *Rostrum* distinctly angular. *Eyes* well developed, but not large, rather remote from each other, bright fulvous. *Peduncle of antennule* scarcely one-fourth as long as the cephalo-thorax, its basal joint short, nearly as wide as long. *Antennal scale* three times as long as wide, reaching by scarcely a third of its length beyond peduncle of antennule, outer margin nearly straight, inner distinctly arcuate, apex bluntly acuminate. *First maxilliped* with the penultimate larger than the preceding joint, and armed with three teeth. *Legs*, first hardly longer than second maxillipeds; tarsus shorter than preceding joint, 2-articulate; nail slender, setiform; second to fifth legs sub-equal in length; tarsus longer than preceding joint, 3-articulate; posterior leg much longer than the rest, very narrow; tarsus elongate, 3-articulate. *Telson* hardly one-fourth as long as abdomen, about twice as long as wide, linguiform, tapering distinctly towards the apex; anterior half of lateral margin naked, posterior half with about eighteen closely set spines of gradually increasing length, apex obtusely rounded, with a short, narrow rectilinear cleft; each side of cleft with (about) two to four minute spines. *Inner uropod* a little longer than telson, about seven-eighths as long as the outer, its inner margin spined throughout (from the level of the centre of the otocyst). *Colour*, body pellucid with a little red pigment here and there. *Length*

of adult female hardly exceeding 8 mm. (Abbreviated with slight alteration from G. O. Sars.)

*Survey.*—Station 115, off the Skelligs, 62 to 52 fathoms, mud and sand. August 20th, 1890 (in muslin bag attached to trawl).

*No Previous British Record.*

*Distribution.*—Western Norway, 50 to 150 fathoms (G. O. Sars).

Our material consists of two specimens, both of adult size. Though considerably damaged, their determination is not difficult. Mr. Green has depicted a first maxilliped of one specimen, and the telson and inner uropod of the other (figs. 6 and 7). The maxilliped has lost most of its setæ. It will be noticed that the cleft of the telson has only two spines on one side and three on the other. Sars describes and figures four on each side, but the variation is unimportant.

[NOTES ADDED IN PRESS.]

NOTES ADDED IN PRESS.

**Euphausia pellucida**, Dana. Taken in the serial tow-nets of Station 2 of Mr. George Murray's "Oceana" Expedition, 52° 45' N., 12° 27' W., 453 fathoms.

An oceanic species of very wide distribution, *not previously recorded from within the British area.*

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**Stylocheiron** sp. Taken in company with the last. *No member of this genus has hitherto been recorded from within the British area.*

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**Nyctiphanes Couchii** (Bell). Evidence presented by a small example (about 6 mm. long), taken off Plymouth, points to the absence of exopods on the fifth and sixth pairs of legs in the female of this species, as in *N. australis*. The imperfect condition of the remaining female specimens in our possession does not permit of the complete establishment of this point. In the female *N. norvegica* exopods are present on all the legs (except the last pair, which are quite rudimentary throughout the genus), as in the males of all three species.

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**Macropsis Slabberi** (Van Beneden). A single specimen taken in a surface tow-net at night, Inisbofin Harbour, 5th August, 1899.

*No Previous Irish Record.*

*Distribution.*—Firth of Forth; Falmouth (A. M. N.\*): Whitsand Bay; Tamar Estuary.

Sweden; Denmark; Holland; Belgium; Mouth of the Seine; Mediterranean; Black Sea (A. M. N.\*): Heligoland; German North Sea Coast (Ehrenbaum); Channel Islands (Walker and Hornell).

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**Erythropros serrata**, G. O. Sars. Specimens from the Clyde, communicated by Mr. W. T. Calman, agree in particulars of serrulation of the inner uropod with the Irish examples.

## LIST SHOWING THE COMPARATIVE REPRESENTATION OF DIFFERENT SPECIES IN THE SURVEY HAULS.

## Station 115, 62 to 52 fathoms:—

<i>Erythroops serrata</i> ,	..	very numerous.
<i>Mysidopsis didelphys</i> ,	..	18.
<i>Mysidella typica</i> ,	..	2.
<i>Mysidopsis hibernica</i> ,	..	1.
<i>Parerythroops obesa</i> ,	..	1.
<i>Schistomysis spiritus</i> ,	..	1.
<i>Nyctiphanes norvegica</i> ,	..	1.

## Station 118, 32 to 28 fathoms:—

<i>Schistomysis ornata</i> ,	..	many.
<i>Leptomysis gracilis</i> ,	..	rather less numerous.
<i>Mysidopsis angusta</i> ,	..	30 ca.
<i>Leptomysis lingvura</i> ,	..	15 ca.
<i>Dasymysis longicornis</i> ,	..	4.
<i>Anchialus agilis</i> ,	..	2.
<i>Mysidopsis gibbosa</i> ,	..	1.

## Station 121 a, 41 fathoms:—

<i>Anchialus agilis</i> ,	..	6.
<i>Leptomysis gracilis</i> ,	..	1.
<i>Schistomysis ornata</i> ,	..	1.

## Station 125, 115 fathoms:—

<i>Mysidopsis didelphys</i> ,	..	1.
<i>Erythroops serrata</i> ,	..	1.

## Station 130, 24 fathoms:—

<i>Leptomysis gracilis</i> ,	..	14.
<i>Thysanoessa neglecta</i> ,	..	12 or 13.
<i>Schistomysis ornata</i> ,	..	12 ca.

## Station 143, 46 to 44 fathoms:—

<i>Schistomysis ornata</i> ,	..	4.
<i>Erythroops serrata</i> ,	..	2.
<i>Mysidopsis angusta</i> ,	..	2.

## Station 144, surface over 45 fathoms, ca:—

<i>Thysanoessa neglecta</i> ,	..	many.
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## Station 145, 5 fathoms or less:—

<i>Siriella armata</i> ,	..	9.
<i>Gastrosaccus sanctus</i> ,	..	5.
<i>Leptomysis mediterranea</i> ,	..	1.

## Station 148, 38 fathoms:—

<i>Schistomysis ornata</i> ,	..	6.
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## Station 223, 9 to 4 fathoms:—

<i>Schistomysis spiritus</i> ,	..	many.
<i>Gastrosaccus spinifer</i> ,	..	2.

EXPLANATION OF PLATE I.\* [XVI.\*]

Figure

1. Male of *Nyctiphanes Couchii*, 12 mm., from Valentia Harbour.
2. Telson and inner uropod of *Parerythrops obesa* from S.W. Ireland, dorsal aspect.
3. The same, ventral aspect.
4. Telson and inner uropod of *Mysidopsis hibernica* from S.W. Ireland, dorsal aspect.
5. Inner uropod of same, ventral aspect.
6. Telson and inner uropod of *Mysidella typica* from S.W. Ireland, dorsal aspect.
7. First maxilliped of same.

[In figs. 4 to 6 the setæ have been omitted.]

\* Owing to a misunderstanding, for which the editor is in no way responsible, the plate was allowed to go to press before certain necessary corrections had been made. The exopodite of the sixth leg (the penultimate thoracic appendage, the last being rudimentary) is not shown; and the structure of the remaining legs is obscure, each exopodite appearing to consist of a single ciliated joint directly articulated to the rest of the limb. This erroneous impression is conveyed by the complete masking of the basal portion of the endopodites by the proximal joints of the exopodites. The gills are shown in accurate detail in fig. I., p. 6 [p. 226.]

