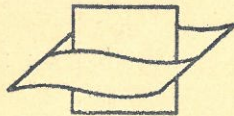


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*On British Mysidæ, a Family of Crustacea Schizopoda.* By  
the Rev. Canon A. M. NORMAN, M.A., D.C.L., F.R.S., &c.

[Plates IX. & X.]

IN the 'Annals' for June I published a paper on the British species of the families Lophogastridæ and Euphausiidæ; it is my present purpose to complete the account of our Schizopoda by the following descriptions of the Mysidæ.

Only six species of this family were described in Bell's 'British Stalk-eyed Crustacea.' Since the publication of that work a considerable number of additional species have from time to time been recorded or described. The present paper will be found to contain thirty-three forms, the known geographical distribution of which will be seen in the following table:—





Professor G. O. Sars has recorded forty-five species of Schizopoda from Norway (including Finmark). Of these the following have not yet been found in our seas:—

1. *Euphausia pellucida*, Dana. Oceanic.
2. *Boreomysis arctica*, Kröyer. 200-400 fath.
3. — *tridens*, G. O. Sars. 200-400 fath.
4. — *megalops*, G. O. Sars. 80-200 fath.
5. *Erythroptis microphthalma*, G. O. Sars. 100-500 fath.
6. — *abyssorum*, G. O. Sars. 150-230 fath.
7. *Pseudomma roseum*, G. O. Sars. 200-300 fath.
8. — *affine*, G. O. Sars. 200 fath.
9. — *truncatum*, Smith. 150 fath.
10. *Parerythroptis obesa*, G. O. Sars. 80-300 fath.
11. — *abyssicola*, G. O. Sars. 100-300 fath.
12. — *robusta*, Smith. 60-150 fath.
13. *Amblyops abbreviata*, G. O. Sars. 150-300 fath.
14. *Mysideis insignis*, G. O. Sars. 100-300 fath.
15. — *grandis*, Goës. 30-100 fath.
16. *Hemimysis abyssicola*, G. O. Sars. 150-300 fath.
17. *Mysidella typica*, G. O. Sars. 50-150 fath.
18. — *typhlops*, G. O. Sars. 150-200 fath.
19. *Mysis oculata*, Fabr.
20. — *mixta*, Lilljeborg.

It will be observed that with the exception of the last two species, which are arctic forms not likely to occur in our seas, all the species in the preceding list are deep-water species, which may be found when the deep-water fauna to the west of our islands shall have been properly investigated.

Sars's work on the Mediterranean Mysidæ contains twenty-one species, and of these fifteen are here recorded as British, together with one not in Sars's list—*Hemimysis lamornæ*. That such a percentage of Mediterranean forms should also be known in our northern seas is quite at variance with the distribution of other orders of the Crustacea, or, indeed, of any class of the Invertebrata. The wider range of the Schizopoda is probably due to their more active and swimming habits. Thus likewise from the north vast shoals of Euphausiidæ appear to come southwards and make their appearance in the winter months on our eastern coast—and probably on our western also, though as yet they have only been observed off our eastern shores.

Fam. *Mysidæ*.

*Maxillipeds* stoutly built; exopodite natatory, multiarticulate; epipodite lanceolate and projected into the branchial cavity. *First limbs* of the trunk (here called the gnathopods) are generally like in the general aspect of the endopodite to the maxillipeds\*, and differ totally from the following six pairs of *legs*, which are all developed and have their distal portion (here called tarsus) in most cases divided into numerous setiferous articulations. Nail generally feeble or absent, more rarely well developed. No true *branchiæ* present. *Marsupial pouch* composed of two or three (in *Boreomysis* of seven) pairs of leaf-like processes springing from the bases of the posterior legs. *Pleopods* in female small and rudimentary, in male much more developed †; sometimes in that sex all except the first are biramose and all multiarticulate and natatory; in other genera they are variously modified and the third or fourth pair, or both these pairs, are specially developed to subserve sexual functions. *Inner uropods* with acoustic organ at their base. *No phosphorescent organs*. *Telson* very variable in form, but never as in the Euphausiidae.

*Synopsis of Subfamilies.*

- A. *Outer uropods* two-jointed, outer margin of the first joint spined. Telson entire. Tarsus of legs with only one or two joints, with a two-jointed nail ..... *Cynthiliinae*.
  - B. *Outer uropods* one-jointed, their outer margin spined. Telson entire. Tarsus of legs multiarticulate ..... *Gastrosaccinae*.
  - C. *Outer uropods* one-jointed, their outer margin setose.
    - 1. *Gnathopods* conforming in general character of endopodite to the maxillipeds.
    - 2. *Gnathopods* conforming in general character to the first legs.
- 1.—a. First legs greatly developed, very strong, and much larger than the following, their tarsus

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\* In *Mysidella* the gnathopods are quite different from the maxillipeds and very like the first legs.

† But in the genera *Heteromysis* and *Mysidella* the pleopods of the two sexes are of similar character.

two-jointed—first joint very large, spined, second minute; nail strong. Tarsus of remaining five feet multiarticulate. Antennal scale ovate, shorter than peduncle of antennæ. Pleopods simple in both sexes .. *Heteromysinae*.

b. First legs not unlike the following in general character. Male with all the pleopods greatly developed and adapted for swimming, second to fifth pairs biramose, all branches multiarticulate and setose, the outer branch of fourth and sometimes also of third modified for sexual purposes, but the modification only extending to a slight lengthening of the limb and a change in the character of the setæ of the terminal joints ..... *Leptomysinae*.

c. First legs not unlike the following in general character. Male with first, second, and fifth\* pleopods as in female; third consisting of a basal joint and two short branches †; fourth of basal joint and two branches, inner minute, outer styliform and generally of great length. *Mysinae*.

d. First legs not unlike the following in general character. Male with first, second, and fifth pleopods as in female, third and fourth with a basal joint and two branches, the inner minute, one-jointed, the outer in both pairs styliform, but longer in fourth than in third. . *Stilomysinae* (not British).  
Genus *Stilomysis*, gen. nov.:  
type *Mysis grandis*, Goës, = *Mysideis grandis*, G. O. Sars.

2. Pleopods of male all rudimentary, as in female. Maxillipeds strongly built, differing widely in character from those of other Mysidæ; last joint without setæ, terminating in a very long spine and three or more shorter spines. Gnathopods resembling in general character the following legs. *Mysidellinae* (not British).  
Genus *Mysidella*, G. O. Sars ‡.

\* *Hemimysis* is an exception; in it the fifth pleopods are greatly developed into swimming-organs, and consist of a large basal joint and two multiarticulate strongly setose branches.

† But *Neomysis* and *Diamysis*, Czerniavsky (type *Mysis bahirensis*, G. O. Sars), have third pleopod simple, as in female.

‡ I have brought *Stilomysis* and *Mysidella* into this table, because those genera may occur in our seas.

Fam. *Mysidæ*.

*Maxillipeds* stoutly built; exopodite natatory, multiarticulate; epipodite lanceolate and projected into the branchial cavity. *First limbs* of the trunk (here called the gnathopods) are generally like in the general aspect of the endopodite to the maxillipeds\*, and differ totally from the following six pairs of *legs*, which are all developed and have their distal portion (here called tarsus) in most cases divided into numerous setiferous articulations. Nail generally feeble or absent, more rarely well developed. No true *branchiæ* present. *Marsupial pouch* composed of two or three (in *Boreomysis* of seven) pairs of leaf-like processes springing from the bases of the posterior legs. *Pleopods* in female small and rudimentary, in male much more developed †; sometimes in that sex all except the first are biramose and all multiarticulate and natatory; in other genera they are variously modified and the third or fourth pair, or both these pairs, are specially developed to subserve sexual functions. *Inner uropods* with acoustic organ at their base. No *phosphorescent organs*. *Telson* very variable in form, but never as in the Euphausiidæ.

*Synopsis of Subfamilies.*

- A. *Outer uropods* two-jointed, outer margin of the first joint spined. Telson entire. Tarsus of legs with only one or two joints, with a two-jointed nail ..... *Cynthiliinæ*.
- B. *Outer uropods* one-jointed, their outer margin spined. Telson entire. Tarsus of legs multiarticulate ..... *Gastrosaccinæ*.
- C. *Outer uropods* one-jointed, their outer margin setose.
  - 1. *Gnathopods* conforming in general character of endopodite to the maxillipeds.
  - 2. *Gnathopods* conforming in general character to the first legs.
- 1.—a. First legs greatly developed, very strong, and much larger than the following, their tarsus

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\* In *Mysidella* the gnathopods are quite different from the maxillipeds and very like the first legs.

† But in the genera *Heteromysis* and *Mysidella* the pleopods of the two sexes are of similar character.

two-jointed—first joint very large, spined, second minute; nail strong. Tarsus of remaining five feet multiarticulate. Antennal scale ovate, shorter than peduncle of antennæ. Pleopods simple in both sexes . . . *Heteromysinae*.

b. First legs not unlike the following in general character. Male with all the pleopods greatly developed and adapted for swimming, second to fifth pairs biramose, all branches multiarticulate and setose, the outer branch of fourth and sometimes also of third modified for sexual purposes, but the modification only extending to a slight lengthening of the limb and a change in the character of the setæ of the terminal joints . . . . . *Leptomysinae*.

c. First legs not unlike the following in general character. Male with first, second, and fifth\* pleopods as in female; third consisting of a basal joint and two short branches †; fourth of basal joint and two branches, inner minute, outer styliform and generally of great length. *Mysinae*.

d. First legs not unlike the following in general character. Male with first, second, and fifth pleopods as in female, third and fourth with a basal joint and two branches, the inner minute, one-jointed, the outer in both pairs styliform, but longer in fourth than in third. . . *Stilomysinae* (not British).  
Genus *Stilomysis*, gen. nov.:  
type *Mysis grandis*, Goës, = *Mysideis grandis*, G. O. Sars.

2. Pleopods of male all rudimentary, as in female. Maxillipeds strongly built, differing widely in character from those of other Mysidæ; last joint without setæ, terminating in a very long spine and three or more shorter spines. Gnathopods resembling in general character the following legs. *Mysidellinae* (not British).  
Genus *Mysidella*, G. O. Sars ‡.

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\* *Hemimysis* is an exception; in it the fifth pleopods are greatly developed into swimming-organs, and consist of a large basal joint and two multiarticulate strongly setose branches.

† But *Neomysis* and *Diamysis*, Czerniavsky (type *Mysis bahirensis*, G. O. Sars), have third pleopod simple, as in female.

‡ I have brought *Stilomysis* and *Mysidella* into this table, because those genera may occur in our seas.



Subfam. I. *CYNTHILIINÆ*.

Genus 1. *CYNTHILIA*, J. E. Gray, 1850\*.

= *Cynthia*, J. V. Thompson (non Fabr., nec Sav., nec Latr.).  
 = *Siriella*, Dana, 1852.

*Rostrum* produced, pointed, sometimes of great size. *Antennal scale* more or less subrhomboidal, outer margin naked, terminating in a spine. *Legs* having the tarsus only two-jointed and terminating in a well-developed two-jointed acute nail, encircled at the base with setæ. *Telson* linguiform or lanceolate, apex entire, sides furnished with spines of unequal length. Outer uropods two-jointed, first joint spined (not setose) on outer margin. *Male* with pleopods having multi-articulate swimming-branches, the inner branch furnished usually with a bifid process, which is usually on the middle pairs curiously involutely coiled.

This genus is at once distinguished from all others by the character of the peræopods and outer uropods.

1. *Cynthilia norvegica* (G. O. Sars).

1869. *Siriella norvegica*, G. O. Sars, Undersøgelse over Christianiafjordens Dybvandsfauna, p. 40.

1870. *Siriella norvegica*, G. O. Sars, Carcinol. Bidrag til Norges Fauna, I. Monogr. Mysider, p. 24, pls. xvii., xviii.

1886. *Siriella norvegica*, Norman, Fourth Annual Report Fishery Board of Scotland, p. 161; Ann. & Mag. Nat. Hist. ser. 5, 1887, vol. xix. p. 96.

*Body* very slender; cephalothorax hardly broader than pleon. *Rostrum* acutely produced, reaching nearly the middle of first joint of antennules. *Eyes* clavate, of moderate size. *Antennules* having the peduncle much elongated, equalling half the length of the cephalothorax; the first joint a little longer than combined lengths of the two following; third joint longer than the second in female, with three plumose setæ on the inner margin and two or three more at the extremity. *Antennal scale* rhomboidal, scarcely equalling the length of peduncle of antennules, two and a half times as long as broad, very obliquely truncate at the apex, the extremity reaching far beyond the spine of the outer margin. *Legs* rather slender; tarsus and preceding joint equal in length. *Telson* equal in length to one third of the pleon, narrowly lanceolate, constricted near the base, its termination with a strong spine at each corner, and between these three small spines, of which

\* J. E. Gray, Cat. Brit. Anim. in Coll. Brit. Mus., Pt. iv. Crustacea p. 46.

the central is the larger, and two little cilia (or the central portion, as described by Sars, has a "lamina minuta tridentata, dente mediano longiore"), lateral margins densely spined; three or four equal spines on the portion anterior to the constriction, after which smaller spines occupy the spaces between larger ones, towards the extremity every fourth or fifth or sixth spine being larger. *Inner uropods* rather longer than the telson, margined beneath the setæ with a dense row of unequal-sized spines, the terminal two or three also being larger than the rest. *Outer uropods* slightly longer than the inner and nearly twice as broad; second joint nearly twice as long as broad, outer margin of first joint in adult with about sixteen to twenty-three spines. *Length* 20 millim.

Pleopods in male well developed and basal processes of middle pairs completely coiled.

*Hab.* Near May Island, Firth of Forth, 1889, and Moray Firth, 1891 (*T. Scott*); Port Erin, Isle of Man (*A. Walker*): *Mus. Nor.*

*Distribution.* Hardanger Fiord, Norway (*A. M. N.*); West Norway (*G. O. Sars*); off Gibraltar, in lat.  $38^{\circ} 15' N.$ , long.  $5^{\circ} 49' W.$ , from Zool. Stat. Naples: *Mus. Nor.* Christiania Fiord (*G. O. Sars*).

## 2. *Cynthilia Clausii* (*G. O. Sars*).

1876. *Siriella Clausii*, *G. O. Sars*, Nye Bidrag til Kunds. om Middelhavets Invertebratfauna, I. Middelhavets Mysider, p. 81, pls. xxix., xxxi.

1882. *Siriella (Siriellides) Clausii*, Czerniavsky, Monographia Mysidarum imprimis Imperii Rossici, fasc. i. p. 105, fasc. iii. p. 33.

1886. *Siriella Clausii*, Norman, Fourth Report Fishery Board of Scotland, p. 160; *Ann. & Mag. Nat. Hist.* ser. 5, 1887, vol. xix. p. 96.

Very like *S. norvegica*, but a smaller species. *Antennules* with only one plumose seta on inner margin of third joint besides those at the extremity. *Antennal scale* more than three times as long as wide, narrowly subrhomboidal, nearly reaching extremity of peduncle of antennule. *Telson* having three subequal small spines and two cilia between the large spines at the angles of the extremity; not more than two to three smaller spines usually occupy interspaces of larger spines on lateral margins. *Outer uropods* with the terminal joint shorter, about one third longer than broad; outer margin of first joint with ten to fourteen spines. *Length* about 10 millim.

Male with the basal appendage of three middle pairs of pleopods completely coiled.

*Hab.* Tarbert, Loch Fyne, 1886 (*T. Scott*): *Mus. Nor.*

*Distribution*. Naples, 1887 (*A. M. N.*); Adriatic (*Prof. Claus and Vienna Museum*): *Mus. Nor.* Goletta, Cagliari, Syracuse, Messina, and Spezzia (*G. O. Sars*).

### 3. *Cynthilia jaltensis* (Czerniavsky).

1868. *Siriella jaltensis*, Czerniavsky, *Materialia ad Zoographiam Ponticam comparatam*, p. 66, pl. iv. figs. 12, 13.  
1876. *Siriella crassipes*, G. O. Sars, *Middel. Mysider*, p. 89, pl. xxxii.  
1882. *Siriella (Siriellides) crassipes*, Czerniavsky, *l. c.* fasc. i. p. 105, fasc. iii. p. 32.  
1882. *Siriella (Protosiriella) jaltensis*, id. *ibid.* fasc. i. pp. 109, 110, pls. v., vi. fasc. iii. p. 27.  
1886. *Siriella crassipes*, Norman, *Fourth Annual Report Fishery Board of Scotland*, p. 161; *Ann. & Mag. Nat. Hist.* ser. 5, 1887, vol. xix. p. 97.

For descriptions of this and the two following species see my paper in the 'Annals' of 1887.

*Hab.* Cullercoats, Northumberland; Guernsey, 1865; Starcross, Devon, 1884 (*A. M. N.*); Banff (*T. Edward*); Jersey (*Sinel*): *Mus. Nor.* Firth of Forth! (*T. Scott*).

*Distribution*. Naples, 1887\* (*A. M. N.*); Adriatic (*Claus*): *Mus. Nor.* Goletta (*G. O. Sars*), Black Sea (*Czerniavsky*).

If I am right in considering Czerniavsky's *S. jaltensis* to be the same as *S. crassipes*, Sars, the former, though described as sexually mature, must be considered as not fully developed. It is in this light that I regard it.

### 4. *Cynthilia Brooki*, Norman.

1886. *Siriella Brooki*, Norman, *Fourth Annual Rep. Fishery Board Scotland*, p. 162; *Ann. & Mag. Nat. Hist.* ser. 5, 1887, vol. xix. p. 98.

*Hab.* Tarbert, Loch Fyne, 1887 (*Scottish Fishery Board*): *Mus. Nor.*

### 5. *Cynthia armata* (Milne-Edwards).

1837. *Cynthia armata*, M.-Edwards, *Hist. Nat. d. Crust.* ii. p. 463 (mas fide G. O. Sars).  
1853. *Mysis Griffithsiæ*, Bell, *Hist. Brit. Crust.* p. 342.  
*Mysis rostratus*, Guérin, *Iconog. Crust.* pl. xxiii. fig. 3 (probably).  
1876. *Siriella armata*, G. O. Sars, *Middel. Mysider*, p. 96, pl. xxxv.  
1882. *Siriella (Rhinomysis) Griffithsiæ, armata, rostrata, and diversa*, Czerniavsky, *l. c.* fasc. i. pp. 97, 98, 99, fasc. iii. pp. 35, 36, 37.  
1886. *Siriella armata*, Norman, *Fourth Report Fishery Board of Scotland*, p. 162; *Ann. & Mag. Nat. Hist.* ser. 5, 1887, vol. xix. p. 99.

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\* Young taken in some numbers, but no fully developed specimens.

*Hab.* Firth of Clyde (*D. Robertson*); St. Andrews (*M'Intosh*); Tarbert, Loch Fyne (*Scottish Fishery Board*), Starcross, Devon (*C. Parker*); Jersey (*Sinel*): *Mus. Nor.* Plymouth! (*Spence Bate*); Castleton, Isle of Man! (*G. S. Brady*); Torquay (*Griffiths*); Weymouth (*W. Thompson*); Firth of Forth (*T. Scott*).

*Distribution.* Trieste (*Vienna Museum*): *Mus. Nor.* Goletta (*G. O. Sars*).

### 6. *Cynthilia frontalis* (Milne-Edwards).

1837. *Mysis frontalis*, Milne-Edwards, Hist. Nat. d. Crust. vol. ii. p. 459.  
 1845. *Mysis frontalis*, Lucas, Anim. artic. d'Algérie, Crustacés, p. 49, pl. iv. fig. 7.  
 ? 1853. *Mysis producta*, Gosse, Ann. & Mag. Nat. Hist. ser. 2, vol. xii. p. 156, pl. vi. fig. 5 a, b.  
 1863. *Mysis frontalis*, Heller, Crust. d. südlichen Europa, p. 303.  
 1876. *Siriella frontalis*, G. O. Sars, Middel. Mysider, p. 91, pls. xxiv., xxv.  
 1882. *Siriella (Rhinomysis) producta*, Sarsi, and *frontalis*, Czerniavsky, l. c. fasc. i. pp. 98, 99, fasc. iii. pp. 36, 37.  
 1884. *Pseudosiriella frontalis*, Claus, "Kennt. d. Kreislauforgane der Schizopoden u. Decapoden," Arbeiten Zoolog. Inst. Wien, vol. v. Heft iii. p. 6.

The *M. producta* of Gosse and the *M. Griffithsia*, Bell, may be referable either to this species or the last.

*Rostrum* of great size, forming a large subtriangular and acutely pointed plate, much longer than the eyes and reaching beyond the middle of the long peduncle of the antennules. *Eyes* narrow, cylindrical. *Antennules* with very long peduncle, basal joint longer than the two following combined, last with four setæ on the inner margin; inner filament unusually thick. *Antennal scale* rather shorter than peduncle of antennules, subrhomboidal, widening distally, extremity very obliquely truncate and reaching far beyond the spine of the outer margin. *Legs* more stoutly built than in *P. armata*. *Telson* lanceolate, very long, subequal to two preceding segments in length; marginal spines very numerous and towards the extremity very unequal in length; series of eight to seventeen much smaller and equal-sized spines alternating with very much larger spines, the narrowly rounded apex with two of the large spines at the corners and three or four small spines between them. *Inner uropods* rather shorter than telson; inner margin with numerous spines, larger towards extremity, somewhat unequal in length towards the base. *Outer uropod* with about thirty spines on the outer margin, the second joint about one third longer than broad.

In the *male* the pleopods have the branches very long, composed of twelve to fourteen articulations; the inner branch furnished at the base with a lateral leaf-like process (as in the genus *Leptomysis*) instead of the bilobate and convoluted organs usual in the genus *Siriella*. Length 25 millim.

In consequence of the absence of convolution in the organ attached to the pleopods of the male in this species Claus has constituted a genus for its reception under the name *Pseudo-siriella*.

*Hab.* Plymouth, 3 fath., August 5, 1889 (*A. M. N.*). "*Mysis producta*" was taken by Gosse at Weymouth.

*Distribution.* Adriatic (*Claus*): *Mus. Nor.* Nice (*M. Edwards*); Algiers (*Lucas*); Goletta, Cagliari, Malta, and Syracuse (*G. O. Sars*); Black Sea (*Grebnitzky*).

Subfam. II. *GASTROSACCINÆ*.

Genus 2. *GASTROSACCUS*, Norman, 1869.

= *Acanthocaris*, Sim, 1872, and *Pontomysis*, Czerniavsky, 1882.

*Carapace* deeply emarginate dorsally behind and usually cut into lobes at that part. *First segment of pleon* in female provided with a very large epimeral process which acts in support of the incubatory pouch; that pouch is formed of two pairs of plates. *Eyes* small, cylindrical. *Peduncle of antennules* of great length and very strongly built, their outer filament much swollen at the base. *Antennal scale* small, shorter than peduncle, outer edge naked, terminating in a spine-point. *Legs* having tarsus multiarticulate, bearing spines as well as setæ at each articulation; no nail; *first pleopods* in female well developed, consisting of an elongated curved cylindrical peduncle (which is wider at the extremities than in the middle) and two minute one-jointed branches; remaining pleopods in female very small and simple. *Telson* quadrangular, elongated, with a short cleft at the apex; this cleft margined with serrations, which are larger distally; sides of telson bearing spines of unusually large size. *Outer uropods* one-jointed, their outer edge beset with a series of strong spines.

In the *male* the sexual appendage of the last joint of peduncle of antennules is small and merely nodulous. All the pleopods are biramose and in a great measure formed for swimming. Peduncle of first pair margined with long setæ; peduncles of remaining pairs naked; inner branch of first,

fourth, and fifth pairs very small; outer branch of fourth pair very long, consisting of about seven articulations, wholly devoid of setæ and gradually becoming more slender distally.

### 1. *Gastrosaccus spinifer* (Goës).

1863. *Mysis spinifera*, Goës, "Crust. decapoda podoph. marina Sueciæ &c." (Eftvers. K. Vet.-Akad. Hand. xx.), p. 14 (separate copy).  
 1868. *Gastrosaccus sanctus*, Norman, Brit. Assoc. Rep. for 1867, p. 438; and 1869, "Last Report Shetland Dredging," Brit. Assoc. Rep. for 1868, p. 268.  
 1872. *Acanthocaris Livingstoniana*, G. Sim, "Stalk-eyed Crust. N.E. Coast of Scotland" ('Scottish Naturalist'), p. 4 (separate copy), pl. iv. fig. B 1-6.  
 1880. *Gastrosaccus spinifer*, Stebbing, Ann. & Mag. Nat. Hist. ser. 5, vol. vi. pp. 114 and 328, pl. iii.  
 1882. *Gastrosaccus spiniferus*, Czerniarsky, l. c. fasc. i. p. 87, fasc. iii. p. 5.  
 1890. *Gastrosaccus sanctus*, Meinert, Vidensk. Udbytte af Kanonbaaden, "Hauch's" Togter. Crust. Malacostraca, p. 207.

Central portion of hind margin of carapace cleft into a number of fringe-like filaments. *Fifth segment of pleon* dorsally terminating in a produced spine-shaped process. *Antennules* with three strong spines on outer margin of second joint of peduncle, inner margin of third joint without conspicuous setæ. *Antennal scale* reaching middle of second joint of peduncle of antennules, its apex not extended beyond extremity of spine of outer margin. *Telson* with six to eight very large spines on margin, the two distal spines not conspicuously larger than preceding. *Inner uropods* slightly longer than the telson, having nine to eleven spines on the inner margin. *Outer uropods* having the apex bluntly and somewhat obliquely rounded, its outer margin with about thirteen to seventeen large closely-set spines, which are ciliated on the distal margins and have their apices of peculiar form, the edge being folded over, as though a cone-like hollow process was thus formed.

In the *male* the third pleopods have the ultimate joint bearing two small spines on the edge and terminating in two equal-lengthed spine-like processes, one of which is ciliated at the edge. Length 20 millim.

*Hab.* Shetland (*A. M. N.*), Banff (*T. Edward*), Moray Firth (*T. Scott*), Firth of Clyde (*D. Robertson*); Starcross, Devon (*C. Parker*); *Mus. Nor.* Aberdeen (*Sim*); Whitby (*Stebbing*); off Bo'ness, Firth of Forth (*T. Scott*).

*Distribution.* Bahusia in Sweden (*Lovén*, fide *Goës*); Denmark (*Meinert*); mouth of the Seine (*de Kerville*).

2. *Gastrosaccus sanctus* (Van Beneden).

1860. *Mysis sancta*, P. J. van Beneden, Recherches sur la Fauna littorale de Belgique, Crustacés, p. 17, pl. vi. figs. 1-4.  
 1876. *Gastrosaccus sanctus*, G. O. Sars, Middelhavets Mysider, p. 56, pls. xxi., xxii., xxiii., ♂ ♀.  
 1882. *Gastrosaccus sanctus*, Czerniavsky, l. c. fasc. i. pp. 85, 86, fasc. iii. pp. 2, 3, 4.  
 1882. *Pontomysis caucasica*, Czerniavsky, l. c. fasc. i. p. 79, fasc. iii. p. 6, pl. iv. figs. 4-20.  
 1885. *Gastrosaccus sanctus*, Carus, Prodrömus Faunæ Mediterraneæ, p. 467.

Hinder margin of carapace dorsally furnished with two lobes, one on each side of the centre, which are projected upwards and forwards. *Fifth segment of pleon* not furnished with a dorsal spine. *Antennal scale* with the slightly oblique apex scarcely extending beyond the spine of outer margin; penultimate joint of peduncle of antennæ with five plumose setæ on inner margin, last joint with three. *Legs* with tarsus composed of 7-14 articulations, the number of articulations increasing on the posterior limbs. *Telson* shorter than preceding segments, with six spines on each side. *Inner uropods* with about six spines on inner margin. Length about 13 millim.

"*Maris appendices genitales subcylindricæ, apice irregulariter lobatæ extus setis ciliatis sex ornatæ. Pedes ejus spurii omnes natatoriæ et longe setiferi, ramo exteriori in 1mo et 2do pari 9-articulato, in paribus 2 posterioribus 8-articulato: pedes spurii 3tiii paris parte basali bene evoluta, ramo interiori structura eadem ac in 2do, 8-articulato, articulo basali extus processu brevi laminari instructo, ramo exteriori styliformi, triplo fere longiore, in segmenta 4 sensim et longitudine et latitudine decrescencia diviso, ultimo tenuissimo aculeis apicalibus 3 parvis armato.*" (*G. O. Sars.*)

*Hab.* Jersey, 1884 (*Sinel*): *Mus. Nor.*

*Distribution.* Naples, 1887 (*A. M. N.*); Belgium (*Van Beneden*); Goletta and Naples (*G. O. Sars*); Boulogne (*Giard*).

3. *Gastrosaccus Normani*, G. O. Sars.

1876. *Gastrosaccus Normani*, G. O. Sars, Middelhavets Mysider, p. 65, pls. xxiv., xxv.  
 1882. *Gastrosaccus Normani*, Czerniavsky, l. c. fasc. i. p. 87, and fasc. iii. 1885, pp. 2, 3, 5.  
 1885. *Gastrosaccus Normani*, Carus, l. c. p. 467.

*Hinder margin of carapace* simple. No dorsal spine on

fifth segment of pleon. *Antennules* with only two small spines on outer margin of second joint, third joint having five spine-like setæ on inner margin. *Antennæ* with only one seta on inner margin of the penultimate and last joint of peduncle; apex of scale extending considerably beyond the spine of termination of outer margin. *Telson* longer than preceding segment, with about ten spines on each margin. *Legs and uropods* nearly as in *G. sanctus*. Length about 13 millim.

“*Maris appendices genitales* subfusiformes, medio valde incrassatæ, setis modo 3 instructæ. *Pedes spurii* ab iisdem speciei antecedentis sat discrepantes. *Imum par* bene evolutum structura fere ut in *G. sancto*, *2dum par* vix natatorium, ramis forma dissimili setis ciliatis carentibus, externo cylindrico, paulo flexuoso 8-articulato, articulis 4 ultimis extus aculeo tenui et lanceolato armatis, interno paulo brevior, valde flexuoso, sigmoideo, 6-articulato, articulo primo sat magno et laminari, ultimis 3 tenuissimis, setis apicalibus 2 parvis; tertium par parte basali apice oblique truncato, angulo exteriore in processum securiformem producto, ramo interno perbrevis, et rudimentari appendicem modo parvam uniarticulatam formante, externo vero valde elongato, styli-formi, dimidiam postabdominis longitudinem fere æquante, in segmenta 4 diviso, 2 anterioribus elongatis, 2 posterioribus dimidia parte brevioribus, aculeis apicalibus 2 brevibus; paria 2 posteriora minima, parte basali brevi, subtriangulari, ramo externo modo 3-articulato setis paucis ornato.”

*Hab.* Off Rockall, ‘Porcupine,’ 1869; off Valentia, Ireland, 1870 (*A. M. N.*).

*Distribution.* Naples, 1887 (*A. M. N.*); Goletta, Syracuse, Naples, and Spezzia (*G. O. Sars*).

### Genus 3. ANCHIALUS, G. O. Sars, 1876.

*Rostrum* more or less produced. *Antennal scale* unusually small, outer margin naked, terminating in a spine-point, extremity oblique. *Labrum* drawn out into a long point, which is slightly serrated on the margins. *Legs* with distal portion (tarsus) divided into several articulations, not unguiculate. *Marsupial pouch* formed of four pairs of lamellæ. *First pleopods* in female one-jointed, wider at base, then cylindrical; remaining pleopods rudimentary. *Telson* very large, cleft at the extremity, sides with very numerous ciliated spines. *Inner uropods* having inner margin edged throughout with spines of unequal length. *Outer uropods* one-jointed, outer margin spined; all setæ of uropods very short.



*Male*. Peduncle of antennules with sexual appendage very small, tubercular. First peræopods stronger than the rest; distal joints short, expanded, furnished with long strap-formed appendages. Pleopods with largely developed peduncle, the first consisting of a single branch, the rest with two multi-articulate branches, and a subovate laminary plate at the base of the inner branch; outer branch of fourth pair about three times as long as inner, multiarticulate (ten articulations), terminating in not long spiniform setæ.

*Anchialus agilis*, G. O. Sars.

1870. *Anchialus agilis*, G. O. Sars, Middelhavets Mysider, p. 70, pls. xxvi.-xxviii.

1883. *Anchialus agilis*, Czerniavsky, *l. c.* fasc. iii. p. 42.

1885. *Anchialus agilis*, Carus, *l. c.* p. 468.

This little species is of very robust form, the breadth both of cephalothorax and pleon being greater in proportion to their length than in any other European Mysidean, the cephalothorax wider behind than in front. *Kostrum* somewhat linguiform, of considerable size, concealing the greater part of first joint of antennules. Peduncle of *antennules* stout, of moderate length, first and third joints subequal. *Antennal scale* minute, scarcely reaching extremity of penultimate joint of peduncle of antenna, and not half as long as peduncle of antennules, subrhomboidal, rather more than twice as long as broad; outer margin naked, terminating in a spine, beyond which the apex is obliquely truncate, and is, as well as inner margin, ciliated; from the inner side of the first joint of the antennæ there springs a long spine, which is serrated on the edges. *Legs* having the fourth joint much longer than the third, and the tarsus composed of three articulations. *Pleon* having the epimera produced downwards and backwards, angulated, and edged with finely plumose setæ. *Telson* very large, as long as the long inner uropods, and half as long as the pleon, the margins straight, and gradually and but slightly converging from the base to the extremity, which is incised to a depth subequal to breadth of same part of telson; sides of telson with about thirty ciliated spines, terminal spines much larger than the rest, the cleft minutely and closely dentated. *Uropods* having the auditory apparatus small; inner uropods with inner margin edged with ciliated spines of unequal length and fine hairs; apex terminating in two spines of much larger size; outer margin edged with fine hairs. Outer uropod having inner margin edged with fine hairs, and the outer bearing about thirty simple subequal spines. Length 8 millim.

The *male* has the last joint of peduncle of antennules furnished with a small densely pilose tubercle, which scarcely reaches beyond the extremity of the joint from which it springs. The peræopods have the tarsus strongly spined. The pleon has not the epimera produced. The first feet are longer and stouter than the rest, and the terminal joints are furnished with seven curious long strap-formed appendages.

*Hab.* Plymouth, a single female, 1890 (*A. M. N.*).

*Distribution.* Naples (*A. M. N.*); Messina and Naples (*G. O. Sars*).

### Subfam III. *HETEROMYSINÆ*.

#### Genus 4. *HETEROMYSIS*, *S. I. Smith*, 1874.

= *Chromysis*, *G. O. Sars*, 1877 (non *Heteromysis*, *Czerniavsky*, 1882).

*Body* moderately robust. *Carapace* behind leaving two segments of cephalothorax partially uncovered; rostrum scarcely developed. *Eyes* small, on short stout peduncles. *Antennal scale* elliptic, small, setose on both margins. *First legs* quite unlike the rest, very much stouter and also longer; the propodal joint strong, composed of two articulations, the first long, furnished with spines and setæ on inner edge, the second very short; nail well developed. All the following legs are slender, the tarsus multiarticulate, ending in a slender setiform claw. *Telson* cleft at the extremity. *Outer uropods* setose on both margins, without a second joint.

Prof. *S. I. Smith* thus describes the male, which I have not seen:—"Terminal segment of the peduncle of antennule wanting the usual elongated sexual process, but having in its place a very dense tuft of long hairs . . . The appendages of the first five segments of abdomen alike in both sexes; short and rudimentary, and like the same appendages in the female *Mysis* . . . In life the males are semitranslucent and colourless, while in the females the antennulæ, the flagella of the antennæ, the ocular peduncles, the thorax with the marsupial pouch, and the articulations of the caudal appendages are beautiful rose-colour."

#### *Heteromysis formosa*, *S. I. Smith*. (Pl. IX. figs. 6-11.)

1873. *Heteromysis formosa*, *S. I. Smith*, U. S. States Fish and Fisheries Comm. Report, 1871-72, p. 553.

1879. *Heteromysis formosa*, *S. I. Smith*, "Stalk-eyed Crust. Atlan. Coast N. Amer.," Trans. Connec. Acad. vol. v. p. 101.

1882. *Heteromysis norvegica*, *G. O. Sars*, "Oversigt Norges Crustaceer, I.," Christ. Videnskab. Forhand. 1882, p. 54, pl. i. figs. 21, 22.

*Rostrum* short, obtusely rounded. *Eyes* small; peduncles short and thick. *Antennal scale* small, scarcely as long as peduncle of antenna, narrowly elliptic, about three and a half times as long as broad, setose all round. *First legs* strongly built, only seven-jointed; ischium and meros subequal in length, both strongly formed, the latter with 4 (6-8\*, *S. I. S.*) spines and numerous setæ on front margin; penultimate articulation minute, subquadrate; finger largely developed. *Remaining legs* of usual Mysidean type; tarsus of 5-6 articulations; nail setiform. *Telson* short, length to breadth as about 5 to 3, cleft at the extremity; distal portion of lateral margins with 14-17 spines (11-16, *S. I. S.*); cleft with 16-22 serrations. *Inner uropod* having beneath the setæ on inner margin about 17-19 spines (17-18, *S. I. S.*). Length 8 millim.

I have united Smith's and Sars's species because, 1st, the number of spines on the carpus would appear not to be constant; 2ndly, because the serrations of the cleft sometimes reach the extremity, in other instances not. One of my specimens shows on one side the one condition, on the other the other.

*Hab.* Guernsey, 1865 (*A. M. N.*); Firth of Forth, 1888 (*T. Scott*): *Mus. Nor.*

*Distribution.* Coast of United States (*S. I. Smith*): *Mus. Nor.* Near Bergen, 6-10 fath. (*G. O. Sars*).

Prof. Smith says of this species: "The species was never found in abundance except hidden away inside dead bivalve shells, usually *Mastras*, dredged in 5-10 fath. As many as twenty were sometimes found in a single shell. The males and young were occasionally taken at the surface in the evening in Vineyard Sound." With this hint as regards the habits of the animal it may not hereafter prove so rare on the European coasts as it has hitherto seemed to be.

#### Subfam. IV. *LEPTOMYSINÆ*.

##### Genus 5. *ERYTHROPS*, G. O. Sars.

= *Nematopus*, G. O. Sars.

*Eyes* short, broad, flattened, brilliant red. *Antennal scale* short, linear; external margin not ciliated, terminating in a spine-point; in other cases the margin serrated. *Legs* very long and slender, filiform, tarsus of three articulations; nail

\* In a specimen received from Prof. S. I. Smith I can only see four spines.

ender. *Telson* very short, not half as long as inner uropods, ubquadrate, lateral margin naked; extremity broadly truncate, bearing four spines and two setæ. *Pleopods* in female small, simple; in male formed for swimming, with multiarticulate branches, and a lateral lobe springing from the base of the inner branch.

1. *Erythropus Goësi*, G. O. Sars.

1863. *Mysis erythropthalmus*, Goës, Crust. decap. marina Sueciæ, p. 18.  
 1866. *Nematopus Goësi*, G. O. Sars, Beretning om en i Somm. 1865 foretagen Zool. Reise ved Kysterne af Christianias og Christiansands Stifter, p. 15.  
 1870. *Mysis erythropthalmus*, Jarzynsky, Præem. Cat. Crust. decap. maris albi et litt. Murman (Trudy Soc. Nat. Petropol. vol. i. fasc. ii.), p. 317.  
 1870. *Erythropus Goësi*, G. O. Sars, Carcinol. Bidrag til Norges Fauna, I. Monogr. Mysider, p. 24, pl. i.  
 1883. *Erythropus Goësi*, Czerniavsky, l. c. fasc. iii. p. 16.  
 1889. *Erythropus Goësi*, T. Scott, Seventh Annual Report Fishery Board of Scotland, p. 322.

*Pleon* much narrower than cephalothorax; colour white and hyaline, beautifully variegated with orange and yellow. *Rostrum* small and little prominent, but distinct and narrowly rounded. *Eyes* very large, flattened, broader than long; cornea reniform, much hollowed basally as seen from above, and occupying nearly two thirds of whole organ. *Antennal scale* linear, four times as long as broad, and of nearly equal width throughout, one fourth longer than peduncle of antennules; outer margin naked, terminated above in a spine, beyond which the oblique apex is projected to about twice the length of that spine. *Gnathopods* well developed and strong, combined length of the last two joints equal to the preceding; nail much shorter than the last joint. *Legs* shorter than usual in this genus, the hinder pairs gradually increasing in length; preceding joint not quite so long as tarsus, the first articulation of which is one third longer than the combined length of the two distal joints; last legs when bent backwards reach just beyond the fifth segment of pleon. *Telson* with breadth at the base slightly exceeding the length and twice as broad as at the extremity; sides converging, with nearly straight margins; truncated extremity slightly arcuated, the inner pair of spines twice the length of the outer. *Inner uropods* having the inner margin plain (*i. e.* not serrulated). Length 9–10 millim.

*Hab.* This species has been recently added to the British fauna by Mr. Thomas Scott, who in October, 1888, sent me

specimens for determination which he had procured in the Firth of Forth: *Mus. Nor.*

*Distribution.* West Norway (*G. O. Sars*); Klosterelv Fiord, East Finmark (*A. M. N.*): *Mus. Nor.* Göes gives as localities of this species Finmark (*Lovén*), Christiansund (*Lilljeborg*); Widebay, Spitzbergen, 40 fath., mud. Professor *G. O. Sars* records it from many localities in South as well as West Norway, and from the Lofoten Islands, in depths of 30–100 fath. White and Murman Seas (*Jarzynsky*).

2. *Erythrops elegans* (*G. O. Sars*). (Pl. X. fig. 10.)

1863. *Nematopus elegans*, *G. O. Sars*, Beret. om en i Somm. 1862 foretagen Zool. Reise i Christianias og Trondhjems Stifter, p. 42.  
 1866. *Nematopus pygmæus*, *G. O. Sars*, Beret. om en i Somm. 1865 foretagen Zool. Reise af Christianias og Christiansands Stifter, p. 17.  
 1870. *Erythrops pygmæa*, *G. O. Sars*, Carcinol. Bidrag til Norges Fauna, I. Monogr. Mysider, p. 33, pl. ii. figs. 20–28.  
 1883. *Erythrops pygmæa*, *Czerniavsky*, l. c. fasc. iii. p. 16.  
 1885. *Erythrops pygmæa*, *Carus*, l. c. p. 469.  
 1886. *Erythrops pygmæa*, *Norman*, Fourth Annual Report Fishery Board of Scotland, p. 158; Ann. & Mag. Nat. Hist. ser. 5, 1887, vol. xix. p. 93.

The smallest of all described Mysidea; pleon slightly narrower than the cephalothorax. *Rostrum* short, narrow, and obtusely pointed. *Eyes* rather longer than broad, triangular or pyriform, widening greatly distally, flattened; cornea occupying centrally about one third of total length. *Antennal scale* almost exactly as in *E. Göesii*. *Gnathopods* small and weak, antepenultimate joints longer than the two following, terminal joint as long as the joint from which it springs. *Legs* shorter than those of *E. Göesii*; last pair when bent backwards reaching a little beyond fourth segment of pleon, preceding joint subequal in length to the three articulations of the tarsus; first of these articulations in the anterior legs shorter than in the hinder, equal to the combined length of the two distal. *Telson* nearly as in *E. Göesii*, but the sides slightly arcuated (instead of straight), the extremity truncated in a straight line, and the four terminal spines of subequal length, though the outer are rather the shorter. *Inner uropods* with the inner margin plain (*i. e.* not serrulated). Length 9 millim.

*Hab.* This species was added to the British fauna by Mr. Thomas Scott, who sent the specimen for determination in 1885, which he had taken at Tarbert, in Loch Fyne, in shallow water; and in 1889 he procured it in the Moray Firth: *Mus. Nor.*

*Distribution.* I have dredged it at Solems Fiord, Floro, Norway, in 5 fath. Professor G. O. Sars has recorded it from Romsdals, Christiania, and Hardanger Fiords, in 5–12 fath.; and also in the Mediterranean at Messina and Naples.

3. *Erythrops serrata*, G. O. Sars. (Pl. X. fig. 11.)

1863. *Nematopus serratus*, G. O. Sars, Beret. om en i Somm. 1862 foretagen Zool. Reise i Christianias og Trondhjems Stifter, p. 43.  
 1869. *Nematopus serratus*, Norman, "Last Report Dredging Shetland Isles," Brit. Assoc. Rep. for 1868, p. 270.  
 1870. *Erythrops serrata*, G. O. Sars, Carcinol. Bidrag til Norges Fauna, I. Monogr. Mysider, p. 27, pl. ii. figs. 1–12.  
 1883. *Erythrops serrata*, Czerniavsky, l. c. fasc. iii. pp. 16, 18.

Form less slender than that of *E. Goësi*; cephalothorax rather wider than pleon, on the ventral surface of each of its segments a shortly stalked rounded boss, beset thickly with strong spine-points; colour white, with a reddish spot on each side of each segment of pleon, and a band across the fourth, sometimes also a longitudinal line on each side of cephalothorax; the very large reniform eyes are of a lovely and brilliant ruby-red. *Rostrum* obscure, scarcely developed. *Eyes* almost as in *E. Goësi*. *Antennal scales* narrowly linear, about one fourth longer than peduncle of antennules; length nearly five times that of breadth; external margin having the distal two thirds deeply serrated, or cut into 7–9 large spine-like processes, the most distal of which overlaps the extremity of the scale. *Legs* very long, the hinder pairs rapidly increasing in length, and the last when bent backwards reaching the basal portion of the telson; carpus shorter than the more distal portion of the limb; the succeeding articulation twice as long as the combined length of the two which precede the nail. *Telson* in form as in the other species, but the lateral margins slightly concave; the termination truncated in a straight line, the four terminal spines subequal in the female, but the outer pair one third shorter than the inner in the male. *Inner uropods* having the inner margin minutely serrulated throughout. Length 10–11 millim.

*Hab.* Dredged on a muddy bottom in 40–60 fath. in St. Magnus Bay, Shetland, 1867; and in 1870 in 80–100 fath. off Valentia, Ireland (*A. M. N.*); Moray Firth and Firth of Forth (*T. Scott*): *Mus. Nor.*

*Distribution.* Professor G. O. Sars has dredged this species in the Christiania and Hardanger Fiords, at Christiansund, and among the Lofoten Islands, in depths ranging from 30–150 fath.; and I have myself taken it off Sponholmene in the Hardanger Fiord, in 100 fath. Denmark (*Meinert*).

*Erythrops serrata* is at once distinguished from all other British Mysidea by the serrations of the outer margin of the antennal scale. A species, however, similar in this respect, *E. abyssorum*, G. O. Sars, occurs in Norway, but is distinguished from it by the extraordinary length of the peræopods, the last pair of which when bent backwards reaches beyond the uropods; by the greater production of the apex of the antennal scale, which considerably overtops the point of distal spine-process of outer margin; by the extremity of the telson not being truncated in a straight line, but slightly arcuated; and the inner margin of the inner uropods not being serrulated.

Genus 6. *MYSIDOPSIS*, G. O. Sars.

*Eyes* large, subglobose, somewhat flattened; pigment dark coloured. *Antennal scale* lanceolate, setose all round. *Maxillipeds* 5-articulated, *gnathopods* 6-articulated and very robust, both ending in a nail. *Legs* subequal; *tarsus* 4-articulated, and shorter than preceding joint, ending in a slender nail. *Telson* hollowed above, of moderate size, sides spined, extremity truncated or cleft (cleft simple, that is, not serrated). *Pleopods* in female less narrow than usual, lateral basal dilatation small; in male well developed, with multiarticulate swimming-branches; fourth pair with outer swimming-branch terminating in a single spine-like seta, densely ciliated at the extremity; last pair having, besides the narrow lateral basal lobe on the inner branch, a conical projection ending in a single seta. *Uropods*, *inner* with large acoustic organ, the spines of its inner margin confined to the neighbourhood of the acoustic organ; *outer* broader than usual.

1. *Mysidopsis didelphys* (Norman).

1863. *Mysis didelphys*, Norman, Trans. Tyneside Nat. Field-Club, vol. v. p. 270, pl. xii. figs. 9-11.  
 1864. *Mysidopsis didelphys*, G. O. Sars, Beretning om en i Sommeren 1863 foretagen Zool. Reise i Christiania Stift, p. 27.  
 1869. *Mysidopsis didelphys*, Norman, "Last Report Dredging Shetland," Brit. Assoc. Rep. for 1868, p. 267.  
 1872. *Mysidopsis didelphys*, G. O. Sars, Monogr. Mysider, ii. p. 20, pl. vii.  
 1883. *Mysidopsis didelphys*, Czerniavsky, l. c. fasc. iii. p. 24.

Body robust. Sides of cephalothorax converging gradually forwards into a broadly triangular short rostrum, with acute apex, which extends rather more than half the length of the first joint of the peduncle of the antennules. *Antennal scale* narrowly elongate-ovate, about one third longer than the

peduncle of the antennules; greatest breadth central, about, or rather more than, equal half the length, setose all round. *Telson* somewhat shorter than the uropods, contracted at one third its length, the portion posterior to the constriction being narrow; extremity narrowly truncate, with a well-developed spine at each corner (but no central spines); marginal spines 8-10, the first three or four separated by an interval from the following. *Inner uropods* narrow, a single spine on the inner margin opposite the otolithic process; otolithic area occupying scarcely more than one third of the total length. Length about 14-15 millim.

*Hab.* Forty miles off Tynemouth, Northumberland; Shetland; Firth of Clyde; off Valentia, Ireland (*A. M. N.*); Moray Firth; Firth of Forth, near May Island; Tarbert, Loch Tyne (*T. Scott*): *Mus. Nor.*

*Distribution.* Norway, in Christiania and Hardanger Fiords, Aalesund, Christiansund, and Lofoten Islands, 30-150 fath. (*G. O. Sars*); Denmark (*Meinert*).

## 2. *Mysidopsis gibbosa*, G. O. Sars. (Pl. X. fig. 8.)

1864. *Mysidopsis gibbosa*, G. O. Sars, Zool. Reise 1863 i Christiania Stift, p. 28.

1872. *Mysidopsis gibbosa*, G. O. Sars, Monogr. Mysider, ii. p. 23, pl. viii. figs. 1-13.

1883. *Mysidopsis gibbosa*, Czerniavsky, *l. c.* fasc. iii. p. 24.

1885. *Mysidopsis gibbosa*, Carus, *l. c.* p. 469.

1887. *Mysidopsis gibbosa*, Norman, Ann. & Mag. Nat. Hist. ser. 5, vol. xix. p. 93.

A much smaller species than the last.

Body robust, the pleon generally curiously bent upwards in the middle. *Rostrum* very small, scarcely developed. *Antennal scale* narrowly elongate-ovate, about three times as long as broad, rather more than half as long again as peduncle of antennæ, and about one third longer than peduncle of antennules, setose all round. *Telson* broader throughout than in last species, and distally more broadly truncated; this truncated extremity is furnished with two (rarely three) small spines in the centre, but none at the angles; lateral spines 11-18, no marked interval between the first three or four and the following. *Inner uropods* only slightly longer than the telson, scarcely more than twice as long as the otolithic area, 4-5 small spines within inner margin near the base, opposite the acoustic organ. Length about 6-7 millim.

*Hab.* Valentia, Ireland, 1870 (*A. M. N.*); Tarbert, Loch Fyne, 1885; and Firth of Forth, 1888 (*T. Scott*): *Mus. Nor.*



*Distribution.* Naples (*A. M. N.*), Adriatic (*Prof. Claus*); Norway (*G. O. Sars*): *Mus. Nor.* South and West Norway, 6–10 fath. (*G. O. Sars*); Denmark (*Meinert*); Goletta, Malta, Syracuse, Messina, Spezzia (*G. O. Sars*).

3. *Mysidopsis angusta*, G. O. Sars. (Pl. X. fig. 9.)

1864. *Mysidopsis angusta*, G. O. Sars, Zool. Reise 1863 i Christiania Stift, p. 30.

1870. *Mysidopsis angusta*, G. O. Sars, Monogr. Mysider, p. 27, pl. viii. figs. 14–24.

1883. *Mysidopsis angusta*, Czerniavsky, *l. c.* fasc. iii. p. 25.

1885. *Mysidopsis angusta*, Carus, *l. c.* p. 469.

1886. *Mysidopsis angusta*, Norman, Fourth Annual Report Fishery Board of Scotland, p. 158; Ann. & Mag. Nat. Hist. ser. 5, 1887, vol. xix. ¶ 94.

Body slender. *Rostrum* fairly developed, acute, but not reaching to half the length of the first joint of peduncle of antennules. *Antennal scale* narrow, linear, of nearly equal breadth throughout, 7–8 times as long as broad, twice as long as peduncle of antennæ and of antennules. *Telson* in form nearly as that of *M. gibbosa*, but narrower at the base in proportion to its length; apex cleft, the cleft narrow, and in depth equal to the breadth of the telson at the same part; sides of cleft smooth, and in this respect differing from all other species of *Mysidæ* which have a cleft in the telson; lateral spines 14–16, placed at nearly equal distances, the more distal spines somewhat increasing in size, the last situated at the point of the cleft being the largest. *Inner uropods* longer than telson; acoustic organ not occupying quite half its length; a single spine only on inner margin opposite otolithic area. Length 8 millim.

*Hab.* Banff (*T. Edward*); Moray Firth (*T. Scott*): *Mus. Nor.* Loch Fyne and Firth of Forth, to the east of Incheith (*T. Scott*).

*Distribution.* Norway (*G. O. Sars*): *Mus. Nor.* Christiania and Hardanger Fiords, and Aalesund, Norway; Naples (*G. O. Sars*).

4. *Mysidopsis hibernica*, sp. n. (Pl. IX. figs. 1–5.)

*Rostrum* short, bluntly rounded at the extremity. *Antennules* having the basal joint subequal in length to the two following. *Antennæ* with each of the last two joints of peduncle furnished at the inner side of the extremity with a long spined seta, in addition to ordinary plumose setæ. *Antennal scale* lanceolate, half as long again as peduncle of antennæ, and about four times as long as broad; second joint minute, as broad as long, bearing one pair of lateral

and three terminal setæ. *Mandible* with second and third joints of the palp remarkable on account of the dense clothing of spined setæ on both margins, and especially on the sides, they are of great length on the third joint; simple or plumose setæ are entirely absent\*. *Maxillipeds* and *gnathopods* remarkably massive and strong, terminating in a strong simple nail, on either side of which are several large spines which are ciliated on one margin. *Legs* having the 4-articulated tarsus strong and much shorter than preceding joint, nail slender. *Telson* lanceolate, shorter than inner uropods, gradually attenuating to the extremity, which is narrowly truncate, and armed with three pairs of spines, the inner pair small, the intermediate pair very long, the outer pair somewhat larger than the central pair; sides of telson with twenty spines of equal size, and about equal distances apart, arranged throughout the entire length. *Uropods* very narrow; inner pair with a group of five spines, closely packed, and increasing in length distally, arranged round the curve of the otolithic area; no spines beyond these. The *pleopods* of the male are of the general character in the genus; the specialized outer branch of the fourth pair consists of nine joints, and the antepenultimate bears, like the preceding joint, a pair of plumed setæ; the penultimate is without appendages, the last terminates in a long spine-like seta, which is densely ciliated towards the extremity. Length 15 millim.

One male and one female specimen were procured by me when in Dr. Jeffreys's yacht 'The Osprey,' at Valentia, Ireland, in 1870. I do not know under what circumstances as to depth &c. they were obtained, as I had only labelled the bottle which contained them "Valentia, 1870."

\* Spined setæ but short are often present, as in *M. didelphys*, at the extremity only of the distal joint, the other setæ being plumed or simple.

[To be continued.]

ON BRITISH *MYSIDÆ*, A FAMILY OF  
CRUSTACEA SCHIZOPODA. BY THE REV.  
CANON A. M. NORMAN, M.A., D.C.L., F.R.S.,  
ETC.

*On British Mysidæ, a Family of Crustacea Schizopoda.* By  
the Rev. Canon A. M. NORMAN, M.A., D.C.L., F.R.S., &c.

[Continued from p. 166.]

Genus 7. LEPTOMYSIS, G. O. Sars, 1869.

*Eyes* subglobose, not compressed. *Antennal scale* subulate, ciliated all round, second joint very long and running out to a narrow extremity. *Legs* long and slender; tarsus 3-articulated; a very slender nail. *Telson* linguiform or lanceolate, of considerable size, margins spined, entire at the extremity, which is aculeated with spines of unequal length. *Uropods* long and narrow, ciliated on all sides; acoustic organ large. *Pleopods* in female one-jointed, small and narrow; in male well developed, biramose, multiarticulate, natatory; lateral basal lobe of inner branch small; outer branch of fourth pair having 1-3 terminal articulations furnished with ciliated spines (instead of setæ).

1. *Leptomysis gracilis*, G. O. Sars.

1864. *Mysis gracilis*, G. O. Sars, Beret. om en i Somm. 1863 foretagen Zool. Reise i Christiania Stift, p. 23.  
1869. *Mysis hispida*, Norman, "Last Report Dredging Shetland Isles," Brit. Assoc. Rep. 1868, p. 267.  
1869. *Leptomysis gracilis*, G. O. Sars, Undersøgelser over Christianiafjordens Dybvandsfauna, p. 29.  
1879. *Leptomysis gracilis*, G. O. Sars, Carcinol. Bidrag til Norges Fauna, I. Monogr. Mysider, p. 31, pls. xix., xx.  
1882. *Leptomysis gracilis*, Czerniavsky, Monogr. Mys. Imp. Ross. fasc. i. p. 90, iii. p. 20.

Form slender and elongate; pellucid and almost colourless, except some rosy-coloured blotches at the base of the pleopods; cephalothorax scarcely wider than the unusually long pleon; dermis everywhere (even to the eyestalks and antennules) hispid, with minute scales. *Rostrum* broadly triangular, large, acutely pointed at extremity, reaching beyond the middle of the first joint of the antennules; a notch on front margin on each side of the base of the rostrum over the insertion of the eyes. *Eyes* pyriform, very narrow at the base, and much widening, projected greatly beyond the sides of the cephalothorax. *Antennules* with a long and slender peduncle; first joint hollowed on upper surface, long and slender, the two following much thicker, their combined length equal to that of first. *Antennal scale* very long, narrowly lanceolate (or subulate), twice as long as the long peduncle of the antennules and about nine times as long as the greatest breadth at the base; second joint occupying nearly one third of total length, extremely narrow, furnished with five setæ on each side and one terminal. *Legs* very slender, the 3-articulated tarsus not longer than the preceding joint; nail very long and slender. *Telson* elongated, narrowly linguiform, shorter than inner uropods, constricted near the base, beyond which the sides are gently arched; margins throughout furnished with crowded spines, which towards the extremity are ranged in series of three or four of gradually increasing length; apex narrowly rounded, bearing four spines, the inner pair of which are about two thirds the length of the outer. *Uropods* very narrow, the outer very long, one third longer than the inner; inner swollen at the base, where the otolith is large, bearing a large spine at the extremity itself, and a range of spines of unequal size and irregular arrangement all along the inner margin. Length 13 millim.

*Hab.* A single male was dredged by me in 40-50 fath. five to seven miles off Balta, Shetland, in 1867. Shortly afterwards both sexes were sent to me by T. Edward from Banff. Moray Firth and Firth of Forth (*T. Scott*): *Mus. Nor.*

*Distribution.* Sars has taken this species in the Christiania Fiord, at Stavanger, and at Mosterhavn in the Hardanger Fiord, in 10-40 fath. (*Mus. Nor.*). Boulonnais, France (*Giard*).

The hispidity of the dermis of *L. gracilis* distinguishes it at a glance from its allies.

2. *Leptomysis mediterranea*, G. O. Sars.

1876. *Leptomysis mediterranea*, G. O. Sars, Nye Bidrag til Kundskaben om Middelhavets Invertebratfauna, I. Middelhavets Mysider, p. 27, pls. xix., xx., xxi.  
 1882. *Leptomysis mediterranea*, Czerniavsky, l. c. fasc. i. p. 90, ii. p. 21.  
 1885. *Leptomysis mediterranea*, Carus, Prod. Faun. Medit. p. 467.

General form very slender and narrow and produced; cephalothorax scarcely wider than the pleon, everywhere adorned with arborescent brown pigment markings, which on the pleon, as seen from above, present to the naked eye two blotches on each segment, and at the base of the telson two dark spots. *Rostrum* largely developed, elongate-triangular or conical, extending to the end of the first joint of the peduncle of the antennules. *Eyes* clavate, but not much constricted at the base. *Antennal scale* of extraordinary length, nearly three times as long as the peduncle of the antennules, narrowly lanceolate, length equal seven to eight times the greatest breadth; second joint very distinctly articulated, very long, fully one third of total length, with nine to twelve setæ on each side and one terminal; all the setæ of the antennal scale are shorter than usual. *Telson* linguiform, more than twice as long as the greatest breadth of the base, only slightly constricted near the base; extremity widely rounded (but not nearly so broad as in *L. linguvura*); margin with very numerous spines of unequal length, which towards the extremity arrange themselves in sets of four or five; middle of extremity with a pair of long spines and two (varying from two to four) much smaller spines between them. *Inner uropods* longer than the telson; otolith not very large; inner margin with numerous (about thirty to forty) spines, which are small, and very crowded near the base, but increase in length distally, the last spine being very long and situated just before the end of the uropod. Length 15-16 millim.

*Hab.* Taken by me in great abundance at Guernsey in 1865, and remaining with a MS. name in my collection until it was described by Prof. Sars. I have since obtained it at Jersey, and Starcross, Devon.

*Distribution.* Adriatic (*Claus*). When at the Zoological Station at Naples in 1887 I found this species to be very abundant in the Bay: *Mus. Nor.* Sars has found it at Goletta, Syracuse, and Spezia. Arenys de Mar, Spain (*Antiga*, fide *de Buer*).

The great development of the second joint of the antennal scale enables this species easily to be separated from all other Mysidæ.

3. *Leptomysis lingvura*, G. O. Sars.

- ? 1842. *Cynthia Flemingii*, H. Goodsir, Edin. New Phil. Journ. vol. xxxiii. p. 175, pl. ii. fig. 1.  
 ? 1850. *Cynthia Flemingii*, Bell, Brit. Stalk-eyed Crust. p. 379.  
 ? 1850. *Cynthilia Flemingii*, Gray, List Specimens of Brit. Anim. in B. M., Crustacea, p. 46; White, Pop. Hist. Brit. Crust. p. 147.  
 1866. *Mysis lingvura*, G. O. Sars, Beret. om i Somm. 1865 foretagen Reise, p. 21.  
 1876. *Leptomysis sardica*, G. O. Sars, Middel. Mysider, p. 46, pl. xxxvi.  
 1879. *Leptomysis lingvura*, G. O. Sars, Carcin. Bidrag til Norges Fauna, I. Monogr. Mysider, p. 35, pl. xxi.  
 1882. *Leptomysis pontica*, Czerniavsky, l. c. fasc. i. p. 91, fasc. iii. p. 21, pl. viii. figs. 1-24, pl. ix. figs. 1-13.  
 1882. *Leptomysis lingvura*, Czerniavsky, l. c. fasc. i. p. 90, fasc. iii. p. 22.  
 1883. *Leptomysis sardica*, Czerniavsky, l. c. fasc. iii. p. 21.  
 1886. *Leptomysis lingvura*, Norman, Fourth Ann. Rep. Fish. Board of Scotland, p. 159, and Ann. & Mag. Nat. Hist. ser. 5, 1887, vol. xix. p. 94.

In general form this is much shorter than the last two species, the dermis not hispid, the animal not so pellucid, but stained with yellow and having two black dendritic spots at the termination of the sixth segment of the pleon, from whence the colour branches down into the telson. *Rostrum* not much produced, shortly triangular, acute at the apex, shorter than half the length of the basal joint of the antennules; no notch on the front margin of the cephalothorax over the eye. *Eyes* shorter than in *L. gracilis* and not so very much contracted at the base. *Antennules* with basal joint hollowed above, subequal in length to the two following joints. *Antennal scale* almost exactly as in *L. gracilis*, except that the second joint is somewhat shorter, occupying scarcely one fourth of the total length, with four or five setæ on each side and two terminal. *Telson* shorter than the inner uropods, linguiform, extremity remarkably broad and widely rounded, and occupied by four long spines and two, three, or four shorter spines in each interval between them; margins of telson furnished with very numerous densely-set spines, usually of rather unequal length towards the extremity. *Inner uropods* much shorter than the outer (as about 2 to 3); otolith large; beyond the otolith the uropod is narrower and bears no spine at the extremity, but the inner margin is edged with very numerous spines throughout its length, the spines opposite the otolith being much smaller, slender, and crowded. Length 17 millim.

*Hab.* This species has been known to me as a member of the British fauna for the last twenty-six years, at which time I took it abundantly between tide-marks at Cullercoats,

Northumberland, and within a year or two afterwards at Howden and Seaham Harbour on the Durham coast. It has also been procured for me at Starcross, Devon, by Mr. C. Parker, and I took it in 1889 at Plymouth: *Mus. Nor.* In 1885 Mr. G. Brook sent me a specimen to determine from Tarbert, Loch Fyne. I have always considered it to be the "*Cynthia Flemingii*, H. Goodsir," although his description is very inexact. It is evident from his description of the antennal scale that he had no true *Siriella* (= *Cynthia*) before him, but the account is not sufficiently accurate to allow of his name being adopted.

*Distribution.* Florö, Norway, 10-12 fath.; Naples (*A. M. N.*); Adriatic (*Claus*): *Mus. Nor.* Farsund, 10-12 fath.; Moldö and Aalesund, Norway; Cagliari, Mediterranean (*G. O. Sars*); Black Sea (*Czerniavsky*); Boulonnais (*Giard*).

A *Leptomysis* has been described from the Mediterranean under the names *Leptomysis sardica*, G. O. Sars, and *Leptomysis pontica*, Czerniavsky, which it appears to me cannot be separated specifically from the northern *Leptomysis lingvura*, G. O. Sars. The fact is that the telson is subject to very considerable variation in northern and Mediterranean specimens. That *L. lingvura* occurs in the Mediterranean basin is certain, as some unnamed Mysidæ sent to me by Prof. Claus from the Adriatic unquestionably belong to that species. *Leptomysis sardica* I took at Naples in 1887. The specimens were very much smaller than *L. lingvura* as found in the north, and some only 7 millim. long have the marsupial pouch fully developed; the telson of some of these closely agreed with Sars's figure, but there was considerable variation (from three to five) in the number of small spines between the central long pair of spines; in other specimens there were one or two more pairs of spines on the sides of greater length than the others. On examining small northern specimens of *M. lingvura* of about similar size I find the spination of the telson closely to accord with that of *L. sardica*, and as the animal increases in size the number of larger spines interspersed among the smaller ones of the lateral margins increases also. It appears to me that *L. sardica* must be regarded as a small race of *L. lingvura*, with which it agrees in all general characters. It is no new thing to find that southern examples of an animal are of smaller size than more northern brethren.



Subfam. V. *MYSINÆ*.Genus 8. *HEMIMYSIS*, G. O. Sars, 1869.

*Carapace* having part of one or one and part of a second segment of cephalothorax exposed behind. *Eyes* subglobose, peduncles short. *Antennal scale* rather small, shortly lanceolate; outer margin more or less ciliated, no spine. Mouth-organs generally resembling those of *Mysis*, but the *mandibles* with second joint of palp expanded and subovate. *Legs* with 4-5-jointed tarsus, ending in a very slender spine-like nail. *Marsupial pouch* formed of three pairs of laminae, one of which is very small. *Pleopods* in female small, rudimentary: in male, two first pairs rudimentary, third with large basal joint and one branch; fourth very long, styloform, terminating in two filaments; fifth with large basal joint and two multiarticulate, strongly ciliated branches adapted for swimming. *Telson* not large, cleft at the extremity. *Outer uropods* one-jointed, long and narrow, truncate at the extremity, ciliated all round.

The character of the pleopods in the male distinguishes this from all other genera: while the fourth pair are very like the same organ in *Schistomysis ornata*, the third and fifth pairs are wholly different; these are formed for swimming and closely resemble the same pairs in the genus *Leptomysis*. The female may be distinguished from *Mysis* by the mandible-palp, the short antennal scale, and slender nail of the peræopods.

*Hemimysis Lamornæ* (Couch).

1856. *Mysis Lamornæ*, Couch, 'The Zoologist,' p. 5286.  
 1860. *Mysis Lamornæ*, Norman, Ann. & Mag. Nat. Hist. ser. 3, vol. vi. pl. viii. figs. 4, 5.  
 1863. *Mysis Lamornæ*, Goës, Crust. decap. podoph. Sueciæ, p. 15.  
 1864. *Mysis aurantia*, G. O. Sars, Beret. om en i Somm. 1863 foretagen Zool. Reise, p. 20.  
 1879. *Mysis Lamornæ*, G. O. Sars, Carcinol. Bidrag til Norges Fauna, I. Monogr. Mysider, p. 65, pl. xxx.  
 1882. *Hemimysis pontica*, Czerniavsky, l. c. fasc. i. p. 117, pl. vii. fasc. iii. p. 48.  
 1883. *Mysis aurantia* and *Lamornæ*, Czerniavsky, l. c. fasc. iii. p. 54.

General form short and robust, anterior portion of cephalothorax as broad as or broader than earlier segments of pleon; colour bright red or orange. *Eyes* short but very large, projected only slightly beyond margin of cephalothorax. *Rostrum* very short, obtusely angulated. *Antennules* having the peduncle robust, basal joint equal to the two following. *Antennal scale* elongated-subovate, about three times as long

as wide, only slightly longer than peduncle of antennules; outer margin without any spine, but naked (that is without setæ) on the lower half; from the spot where the setæ commence the margin slopes inwards to the narrowly rounded point, which is subcentral to the length of the scale. *Legs* rather slender; tarsus of 4-6 articulations, the last very slender and terminating in a very slender nail. *Telson* much shorter than inner uropods, gradually narrowing, cleft about one fourth its length, widely open; upper half of sides of telson without spines, distal half with 6-12 lateral spines, the penultimate of which is some distance from the extremity; terminal spines more than usually developed and long, their length often equal to about half the depth of the cleft. *Inner uropods* with 6-10 spines on the inner margin, gradually increasing in length distally and confined to the anterior two thirds of the margin; otolith of moderate size.

*Male*.—*Pleopods* of first two pairs simple; third pair with large and broad basal joint and a single one-jointed ciliated branch, which gives off a small laterally projected process on the outer side of its base: fourth pair very long, consisting of two basal joints, the second of which is long, and two branches; of these the inner is minute, two-jointed, the first giving off a little lateral process, the second terminating in three setæ; outer branch of great length, basal portion composed of five articulations, of which the first is nodulous below at the extremity, and the third and fourth are subequal in length; the limb terminates in two long filaments, which are ciliated towards the extremities, and the outer about half as long again as the inner: fifth pair formed for swimming, of considerable length, reaching to half the length of telson; basal joint long, branches 4-5-jointed, furnished with long setæ; inner branch with a small lateral projection at the base. Length 8-10 millim.

*Hemimysis Lamornæ* is a true *Hemimysis*, agreeing in all generic characters with the type *H. abyssicola*, from which indeed it seems to be chiefly distinguished by its more robust form and fewer lateral spines on the telson. It agrees with that species in the broad flattened second joint of the mandible-palp, in the slender nails in which the legs terminate, in the narrow outer uropods, abruptly truncate at the extremity, and above all in the characters of the pleopods in the male. Prof. G. O. Sars, pl. xxx. fig. 13 (Mon. Norges Mys.), figures the fourth pleopod of the male; but, as he correctly states, it must be "maris junioris," since it is very different from that of the adult.

Czerniavsky's *Hemimysis pontica* altogether agrees with not quite mature specimens of this species.

*Hab.* Falmouth, Plymouth (*A. M. N.*); Banff (*T. Edward*); Seaham, co. Durham (*G. Hodge*); Loch Goil (*D. Robertson*); Tarbert, Loch Fyne, and Firth of Forth (*T. Scott*): *Mus. Nor.* Port Glasgow (*D. Robertson*); Colwyn Bay, N. Wales (*A. O. Walker*).

*Distribution.* When I was at the Zoological Station at Naples I found this species, which had been previously sent to me from the station, breeding in immense numbers in the tanks. Suchum, Black Sea (*Czerniavsky*); Norwegian coast from Christiania to Lofoten (*G. O. Sars*); West Sweden (*Goës*); Denmark (*Meinert*).

#### Genus 9. MACROPSIS, G. O. Sars.

= *Podopsis*, Van Beneden &c. (? Thompson), = *Parapodopsis* and *Mesopodopsis*, Czerniavsky (subgenera).

Animal very slender; cephalothorax much narrower in front than behind; carapace leaving the two hind segments uncovered, and the central portion of the antepenultimate; in front the rostral portion is slightly produced, rounded, its external angles with a well-developed spine. *Antennules* with greatly produced peduncles; antennal scale subulate, ciliated all round. *Eyes* enormously developed, being elevated on very long and nearly cylindrical stalks, so that the total length of the eye is much greater than the breadth of the front portion of the carapace. *Legs* subequal in length, tarsus multiarticulate, no nail. *Telson* very short, basal portion subquadrate, and the apex triangularly produced and serrated beyond the distal spines of the lateral margins.

*Male.*—*Antennules* terminating with the usual two filaments, and having besides a very large hirsute lobe (as usual in male *Mysidæ*) and a fourth appendage consisting of a long narrow, conical, basal process, to the distal extremity of which is attached a single very long seta. *Third pleopods* consisting of a large basal joint and two branches, the inner and larger of one joint, ciliated on the inner margin, the outer much smaller, of two joints. *Fourth pleopods* greatly developed and very like in general form to those of *Schistomysis ornata*: basal joint very long, with two branches—inner minute, one-jointed, with a lateral lobe at the base; outer consisting of three articulations, the second very long, and third short and terminating in two flagella, outer long, many-jointed, inner about one fourth its length, not jointed.

*Macropsis Slabberi* (Van Beneden).

1778. "Steurgernaal met trompetwijze oogen," Martin Slabber, Natuurkundige Verlostigingen, pl. xv. figs. 3, 4.  
 1860. *Podopsis Slabberi*, V. Beneden, Rech. sur la faune litt. de Belgique, Crustacés, p. 18, pl. vi.  
 1863. *Mysis Slabberi*, Goës, Crust. decap. podoph. mar. Sueciæ &c. p. 16.  
 1867. *Podopsis Slabberi*, Marcusen, "Zur Fauna des Schwarzen Meeres," Archiv für Naturg. 1867, p. 359.  
 1876. *Macropsis Slabberi*, G. O. Sars, Middelhavets Mysider, p. 28, pls. xi.-xiii.  
 1882. *Podopsis* (*Mesopodopsis*) *Slabberi* and (*Parapodopsis*) *Goësi*, Czerniavsky, l. c. fasc. i. p. 145.  
 1882. *Podopsis* (*Parapodopsis*) *cornuta*, id. ibid. p. 149, pls. i., ii., and iii., figs. 1-15.  
 1883. *Podopsis Slabberi*, *Goësi*, and *cornuta*, id. ibid. fasc. iii. pp. 48, 49.  
 1885. *Macropsis Slabberi*, Carus, Prod. Faun. Medit. p. 466.

Basal joint of *antennules* subequal in length to rest of peduncle. *Antennal scale* very narrow, subulate, subequal in length to peduncle of antennules, ciliated all round; second joint with a pair of lateral and three terminal setæ. *Telson* short, about one third the length of the outer uropods, exclusive of terminal portion about as long as the breadth at the base; hinder portion of lateral margins with three to seven spines; the extremity of the telson is projected beyond the lateral margin in somewhat triangular form, but the apex is rounded; the entire margin of this terminal portion is serrated. *Legs* having the tarsus composed of seven to eight articulations. *Inner uropods* with a single spinule on the inner margin, a little behind the otolith. *Outer uropods* much longer than inner, narrow, ciliated all round. Length 11-13 millim.

*Hab.* Granton, Firth of Forth, 1884 (*J. R. Henderson*); Falmouth (*G. C. Bourne*).

*Distribution.* Naples, 1887 (*A. M. N.*); Bahusia, Sweden (*Lovén*); Belgium (*Van Beneden*); *Mus. Nor.* Denmark (*Meinert*); Holland (*P. P. C. Hoek*); mouth of the Seine (*de Kerville*); in the Mediterranean, at Goletta, Syracuse, and Spezzia (*G. O. Sars*); Black Sea (*Marcusen &c.*); Odessa and Sebastopol (*Czerniavsky*)\*.

\* The embryology of this species has been studied by Boutchinsky (P.), 'Observations sur le développement de *Parapodopsis cornuta*, Czern.', 1888 (in Russian).

Genus 10. *MACROMYSIS*, A. White \* (1847).

= *Themisto*, H. Goodsir, = *Mysidia*, Dana, = *Synmysis* and *Keslerella*, Czerniavsky.

*Antennal scale* elongated, linear, nearly parallel-sided, four to nine times as long as broad; outer margin naked, terminated by a spine; apex of scale not surmounting or only slightly projected beyond the extremity of this spine. *Legs* with tarsus of four to seven articulations, terminating in a nail. *Telson* cleft at the extremity, cleft serrated. *Fourth pleopod* of male having the inner branch small, two-jointed, the first giving off an outward-directed seta-tipped lobe; outer branch very long and stiliform, consisting of seven gradually attenuating articulations, the terminal one distally verticillately ciliated and bulb-formed at the extremity.

1. *Macromysis flexuosa* (Müller).

1788. *Cancer flexuosus*, Müller, Zool. Dan. vol. ii. p. 34, pl. lxvi. figs. 1-9.  
 1808. *Cancer astacus multipes*, Montagu, Linn. Trans. vol. ix. p. 86, pt. ii. fig. 26.  
 1815 (?). *Praunus flexuosus*, Leach, Edin. Encycl. vii. p. 401.  
 1815. *Mysis spinulosa*, Leach, Linn. Trans. vol. xi. p. 350.  
 1828. *Mysis chamæleon*, J. V. Thompson, Zoolog. Researches, i. p. 28, pl. ii. figs. 1-10.  
 1828. *Mysis Leachi*, id. ibid. p. 27.  
 1844. *Mysis spinulosus*, Zaddach, Synopseos Crust. Prussic. prodromus, p. 2, ♂ ♀.  
 1855. *Mysis flexuosa*, Krøyer, Gaimard, Voyage en Scandinavie &c., Crust. pl. ix. figs. 1-3.  
 1853. *Mysis chamæleon*, Bell, Brit. Stalk-eyed Crust. p. 336, ♀.  
 1853 †. *Themisto brevispinosa* (H. Goodsir), Bell, Brit. Stalk-eyed Crust. p. 384, ♂.  
 1860. *Mysis flexuosus*, Norman, Ann. & Mag. Nat. Hist. ser. 3, vol. vi. pl. viii. figs. 1-3.  
 1860. *Mysis chamæleo*, P. J. Van Beneden, Recher. sur la faune litt. de Belgique, Crustacés, p. 14, pls. ii.-v.  
 1861. *Mysis flexuosa*, Krøyer, Nat. Tidsskr. 3die Række, vol. i. p. 2.  
 1879. *Mysis flexuosa*, G. O. Sars, Carcinol. Bidrag til Norges Fauna, I. Monogr. Mysider, p. 45, pls. xxiv., xxv.  
 1882. *Synmysis flexuosa, chamæleon, Benedeni*, and *Mecznikoi*, Czerniavsky, l. c. fasc. i. pp. 31, 32.

\* A. White, 'List of Crust. in Brit. Mus.' (1847), p. 81; 'Popular History of British Crustacea' (1857), p. 146.

† It seems probable that Goodsir's *Themisto brevispinosa* was the male of this species, but what his *T. longispinosa* was I cannot guess. One thing is certain, that his genus *Themisto*, = *Macromysis*, White, was founded on males of the genus to which I apply the name.

1883. *Synmysis Normani, flexuosa, chamaeleon, Benedeni, Mecnikowi*, and *spinulosa*, Czerniavsky, *l. c.* fasc. iii. pp. 58, 64.  
 1887. *Mysis flexuosa*, Kœhler, "Structure du Cerveau," Ann. Sci. Nat. Zool. sér. 7, vol. ii. p. 159, pls. x., xi.  
 1887. *Mysis chamaeleo*, Nausbaum, "L'embryologie," Arch. de Zool. Expl. et Gén. sér. 2, vol. v. p. 123, pls. vi.-xii.

*Antennal scale* very long, narrow and linear, more than twice as long as peduncle of antennules, and seven to eight times as long as broad; outer margin naked, terminating in a forward-directed spine, the extreme apex of the scale scarcely overtopping the point of that spine. *Tarsus* of legs six-articulated, of last pair five-articulated, nail well developed. *Telson* having cleft at extremity extending about one sixth of total length of telson, moderately open; about twenty-one to twenty-seven spines on each side of telson. *Inner uropods* with largely developed otolith; inner side with about ten to twelve spines, which are confined to the anterior two thirds of the length and situated within the margin of the under surface; these spines gradually increase in size distally. Length 25 millim.

*Hab.* *Mysis flexuosa* is found on all parts of our coasts between tide-marks in rock-pools, and in the Laminarian zone.

*Distribution.* Norway (*G. O. Sars & A. M. N.*); Sweden (*Goës*); Baltic (*Lindström*); Finland (*Cajander*); Denmark (*Meinert*); Holland (*P. P. C. Hoek*); Belgium (*Van Beneden*); France (*Brebisson &c.*). [Black Sea (*Greb-nitzky*)?]\*

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

1869. *Mysis neglecta*, G. O. Sars, Undersøgelse over Christianiafjordens Dybvandsfauna, p. 37.  
 1879. *Mysis neglecta*, G. O. Sars, Carcinol. Bidrag til Norges Fauna, I. Monogr. Mysider, p. 51, pl. xxvi.  
 1882. *Synmysis neglecta*, Czerniavsky, *l. c.* fasc. ii. p. 26, fasc. iii. pp. 57 and 61.

Very like *M. flexuosa* in all its parts, but distinguished by the following characters:—*Antennal scale* about five times as long as broad and not twice the length of the peduncle of the antennules, its apex slightly more extended, to about twice the length of the spine of the external margin. *Tarsus* of legs five-articulated, of last pair four-articulated. *Telson*

\* Grebnitzky (N. A.), Fauna of the Black Sea, 1873 (in Russian). Marcusen (Joh.), 'Zur Fauna des schwarzen Meeres,' also gives *M. spinulosus, chamaeleo*, and *vulgaris*, and *Podopsis Slabberi* as living in the Black Sea.

cleft to about one fifth of its entire length, the cleft very narrow and constricted at the base; margins of telson with eighteen to twenty spines. *Inner uropods* spined almost as in the last, but the otolith is proportionately smaller. Length about 20 millim.

*Hab.* Jersey; Guernsey; Starcross, Devon; Plymouth (A. M. N.); mouth of Loch Fyne (*Dr. Henderson*): *Mus. Nor.* North Wales (A. O. Walker).

*Distribution.* Hardanger Fiord, Norway (A. M. N.); South and West Norway and Lofoten Islands (G. O. Sars); Denmark (*Meinert*).

### 3. *Macromysis inermis* (Rathke).

1843. *Mysis inermis*, Rathke, Beiträge zur Fauna Norwegens, p. 20.  
 1852. *Mysis inermis*, Lilljeborg, Øfvers. af Vet.-Akad. Forhand. p. 3.  
 1861. *Mysis cornuta*, Krøyer, Nat. Tidsskr. 3die Række, vol. i. p. 26, pl. i. figs. 3 a-g.  
 1863. *Mysis cornuta*, Goës, Crust. decap. podoph. marina Sueciæ, p. 14.  
 1864. *Mysis truncatula*, G. O. Sars, Beret. om en i Somm. 1863 foretagen Zoolog. Reise, p. 16 (*monstrositas*).  
 1869. *Mysis inermis*, Norman, "Last Report Dredging Shetland Isles," Brit. Assoc. Rep. for 1868, p. 266.  
 1879. *Mysis inermis*, G. O. Sars, Carcinol. Bidrag til Norges Fauna, I. Monogr. Mysider, p. 54, pl. xxvii.  
 1882. *Keslerella cornuta*, Czerniavsky, l. c. fasc. ii. p. 36.  
 1882. *Keslerella similis*, Czerniavsky, l. c. fasc. ii. p. 38.  
 1883. *Keslerella cornuta, similis, inermis, truncatula*, and *Goësi*, Czerniavsky, l. c. fasc. iii. pp. 67-71.

Anterior margin of cephalothorax not produced, widely rounded, and exposing in front of it a sharp triangular spine which springs from between the bases of the antennules; while thus the margin is not rostrately produced as in the last two species, this spine gives the appearance of a rostrum. *Antennal scale* half as long again as the peduncles of antennules and about four times as long as broad; apex produced beyond base of spine of outer margin to two or three times the length of that spine. *Tarsus* of legs consisting of four articulations; nail well developed and stronger than in allies. *Telson* cleft to nearly one third of total length, cleft very narrow; margins of telson with about seventeen spines. *Inner uropods* having few marginal spines, only about six, which, as in the preceding species, gradually increase in size distally. Length about 20 millim.

*Hab.* Rock-pools, Shetland; Cullercoats, Northumberland; Oban; Plymouth; Guernsey (A. M. N.); Banff (*T. Edward*); Tarbert, Loch Fyne (*Thomas Scott*): *Mus. Nor.* Firth of Forth (*T. Scott*); Isle of Cumbrae (*J. R. Henderson*).

*Distribution.* Kors Fiord; Bukken, Bergen Fiord; Lervig and other places in the Hardanger Fiord; Florö,—all in Norway; Klosterelv Fiord, E. Finmark (*A. M. N.*); Baltic Sea (*Lovén*); Bergen (*Lilljeborg*): *Mus. Nor.* Many localities from Christiania to Vadso (*G. O. Sars*); Sweden (*Goës*); Denmark (*Meinert*); Baltic (*Lindström*); Murman Sea (*Jarzynsky*); Spitsbergen (*Kröyer*). It is a shallow-water species.

Genus 11. SCHISTOMYSIS, gen. nov.\*

= *Synmysis* (partim) and *Austromysis*, Czerniavsky.

*Antennal scale* subrhomboidal or lozenge-shaped, length to breadth as  $2\frac{1}{2}$ – $4\frac{1}{2}$  to 1; outer margin not ciliated, with a spine-like tooth at the extremity †; the end of the scale very oblique and reaching far beyond this spine-point. *Maxillipeds* not unguiculate. *Legs* having the tarsus 5–9-articulated, terminating in a setiform spine. *Telson* cleft at the extremity, cleft serrated. *Fourth pleopods* in male very long: peduncle and inner ramus as usual in *Mysinæ*; outer ramus composed of five or six ‡ articulations and then divided into two long flagella, both of which are ciliated on the distal portion, the outer the longer.

1. *Schistomysis spiritus*, Norman.

1860. *Mysis spiritus*, Norman, Ann. & Mag. Nat. Hist. ser. 3, vol. vi. p. 431, pl. viii. fig. 1; and Trans. Tyneside Nat. Field Club, vol. iv. p. 329, pl. xvii. fig. 1.  
 1866. *Mysis spiritus*, G. O. Sars, Beret. om en i Somm. 1865 foretagen Zool. Reise, p. 19.  
 1869. *Mysis spiritus*, Norman, "Last Report Dredging Shetland Isles," Brit. Assoc. Rep. for 1868, p. 266.  
 1879. *Mysis spiritus*, G. O. Sars, Carcinol. Bidrag til Norges Fauna, I. Monogr. Mysider, p. 58, pl. xxviii.  
 1883. *Synmysis spiritus*, Czerniavsky, l. c. fasc. iii. p. 56.

Form very slender, perfectly hyaline and transparent, almost entirely free from pigment-markings; anterior portion of cephalothorax very narrow, narrower than first joints of pleon. *Eyes* cylindrical, narrow; cornea small, projected outwards and reaching far beyond the sides of cephalothorax. *Antennules* with greatly elongated peduncle, basal joint

\* *σχιστός*, cleft, with reference to the two flagella in which the fourth pleopod of male terminates.

† In *Macromysis* the similar process is an articulated spine; in this genus it seems to be not articulated, but a process of the scale itself.

‡ The very short first articulation generally indistinct.



subequal to or rather longer than the two distal combined; flagella unusually short, the outer not half the length of cephalothorax. *Antennal scale* narrow, subrhomboidal, rather longer than the peduncles of the antennules, more than four times as long as broad, one third of total length extended beyond the spine which terminates the outer margin; termination of the peduncle of flagellum reaching that spine. *Tarsus* of legs subequal in length to the preceding joint, slender, composed of 7-9 articulations; no nail. *Telson* constricted near the base, beyond which constriction the sides are gently arched; cleft shallow and broad, scarcely exceeding one sixth of total length of telson, external margins with 25-30 small spines. *Inner uropods* subequal in length to the telson, curiously twisted and bent inwards at the extremity; inner margin as far as the twist just referred to densely packed with very numerous setiform spines, which overlie each other; otolith large.

*Hab.* Off Balta, Shetland, in 40-50 fath.; Blackhall Rocks, co. Durham, tide-marks; Jersey (*A. M. N.*); Banff (*T. Edward*); Firth of Forth (*T. Scott*): *Mus. Nor.*

*Distribution.* Professor G. O. Sars once observed this species swimming by the shore at Lister, on the Christiania Fiord, in enormous shoals. North Sea, lat.  $56^{\circ} 50' N.$ , long.  $5^{\circ} 10' E.$  (*Kinberg*, fide *Goës*); Denmark (*Meinert*); Holland (*P. P. C. Hoek*); Boulogne, France (*Giard*)\*.

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

1864. *Mysis ornata*, G. O. Sars, Beret. om en i Somn. 1863 foretagen Zool. Reise, p. 18.  
 1869. *Mysis ornata*, Norman, "Last Report Dredging Shetland Isles," Brit. Assoc. Rep. for 1868, p. 266.  
 1879. *Mysis ornata*, G. O. Sars, Carcinol. Bidrag til Norges Fauna, I. Monogr. Mysider, p. 62, pl. xxix.  
 1883. *Synmysis ornata*, Czerniavsky, *l. c.* fasc. iii. p. 56.  
 1885. *Mysis Kervillei*, G. O. Sars, in de Kerville, "Crust. Schizopodes de l'estuaire de la Seine," Bull. Soc. des Amis des Sci. Nat. de Rouen, p. 92, pl. v.

General form less slender than that of *S. spiritus*; anterior portion of cephalothorax nearly as wide as the earlier segments of pleon; ornamented with red, yellow, or brown branching pigment-spots. *Eyes* short and large, scarcely longer than broad; cornea largely developed. *Antennules* having the peduncle of moderate length and stoutness; flagella long, the

\* See Giard (*A.*), "Le Laboratoire de Wimereux en 1888, Recherches Fauniques" (Bull. Sci. de la France et de la Belgique, 1888, p. 220), for this and other references to him.

outer as long as cephalothorax. *Antennal scale* subrhomboidal, slightly longer than peduncle of antennules, three times as long as broad; external margin short, and this portion of the scale extended beyond the spine which terminates the outer margin; typically almost equal to half of the total length, but sometimes proportionately shorter. *Tarsus* of legs rather longer than preceding joint, consisting of five to seven articulations; nail slender, setiform. *Telson* in form and armature nearly as in *S. spiritus*, but the cleft somewhat deeper and occupying about one fourth of the total length. *Inner uropod* (not twisted at the extremity as in *S. spiritus*) with about sixteen well-separated rather slender spines on the inner margin; otolith large. Length 18 millim.

*Hab.* Dredged in 40-50 fath. 5-8 miles off Balta, Shetland; off Seaham, on the Durham coast; off Valentia, Ireland (*A. M. N.*); Banff (*T. Edward*); 25 miles off May Island, in the Firth of Forth, 35 fath. (*Dr. John Murray*); Firth of Forth (*T. Scott*): *Mus. Nor.* Liverpool Bay (*A. O. Walker*).

*Distribution.* Bukken, Bergen Fiord (*A. M. N.*); Dröbak and several places in South and West Norway, and among Lofoten Islands (*G. O. Sars*); Denmark (*Meinert*); Concarneau, France (*Bonnier*); mouth of the Seine (*de Kerville*); Holland (*P. P. C. Hoek*, who records both *S. ornata* and *S. Kervillei*).

*Mysis Kervillei* is founded on large specimens of *S. ornata* in which the eye is proportionately larger, the antennal scale, more especially the part before the extremity of lateral margin, longer, and the number of articulations in tarsus of legs seven. But among specimens kindly sent me by M. de Kerville I find some with the spine-point of the scale on a level with the end of the peduncle of antenna and the tarsus five-jointed; and in specimens from other localities I find considerable variation both in the scale and tarsus, the latter in the front feet having sometimes seven articulations besides the nail.

### 3. *Schistomysis Parkeri*, sp. n. (Pl. X. figs. 1-7.)

*Mandible* having the penultimate and last joints of the palp remarkably broad, the latter more so than in any other member of the genus, scarcely more than twice as long as broad. *Eyes* nearly globular, length scarcely exceeding the breadth. *Antennules* with peduncles short, first joint equalling the two following, second joint transversely narrowly triangular, third joint expanded and very broad, breadth exceeding

length; distally furnished with a circlet of very long plumose setæ, which reach nearly half the length of the very short inner filament, which in the described specimens has only thirteen articulations. *Antennal scale* ovate, broad, with broad, well-rounded extremity; breadth two fifths of length; outer margin naked, terminating in a large spine which is just on a level with the extremity of peduncle of antennæ; extremity reaching far beyond that spine; the second joint bearing six setæ. *Legs* having tarsus composed of four or five articulations. *Telson* cleft at the apex to rather more than one fourth of the length, serrations of cleft unusually few and large (about 40); lateral margin with 15-17 spines. *Inner uropods* remarkably twisted and bent; inner margin with about 15 spines on its central portion, of which the more distal are of great size and equal in length to the breadth of the uropod at that part; beyond this the uropod is very narrow, and just before the extremity there is a single very large spine. *Outer uropods* much longer than inner, unusually parallel-sided; extremity widely truncate, eight setæ taking their origin from this blunt extremity. Length 10 millim.

The *male* has the sexual lobe of the antennules of great size and linguiform, the extremity arching backwards and inwards; inner filament longer than in female, outer directed at nearly a right angle outwards. *Penis* not twice as long as broad.

*Hab.* Starcross, Devon (*Mr. C. Parker*, 1884): *Mus. Nor.*

This species is distinguished at once from all others by the character of the uropods, especially the inner. There is a slight tendency to a twist in the same organ in *S. spiritus*, but to nothing like the extent to which it is carried in the present species, while the spination of the inner margin is quite different from that and from all other forms.

#### 4. *Schistomysis Helleri* (G. O. Sars).

1876. *Mysis Helleri*, G. O. Sars, Nye Bidrag til Kundskaben om Middelhavets Littoralfauna, I. Middelhavets Mysider, p. 8, pls. i. and ii.

1883. *Austromysis Helleri*, Czerniavsky, l. c. fasc. iii. p. 67.

1885. *Mysis Helleri*, Carus, l. c. p. 266.

General form short and robust; width of cephalothorax in front subequal to that of first segments of pleon; adorned with branching pigment-cells. *Eyes* short, somewhat pyriform; the cornea reaching a little beyond the sides of the cephalothorax. *Antennules* having the peduncles moderately long and moderately robust; the flagella long, the external longer than the cephalothorax. *Antennal scale* rhomboidal,

about three times as long as broad and one third longer than peduncles of antennules, about one third of its length extended beyond the spine which terminates the naked outer margin. *Legs* having the tarsus subequal in length to the preceding joint, composed of four articulations, the first of which is very short and nodulously swollen; nail long and slender; last peræopods very short, about half the length of preceding pairs, and without any nail. *Telson* broad, sides flexuous, but the breadth much more equal throughout the length than usual, scarcely narrowing distally; greatest breadth subequal to half the length; cleft short, scarcely one fifth of length, triangular, widely open; lateral margins of telson with 14-16 spines distributed throughout the length. *Inner uropods* a little longer than telson, with only about nine widely separated spines on the inner margin, the most distal some way from the extremity. *Outer uropods* nearly one third longer than the inner. Length 11 millim.

*Hab.* Guernsey; Starcross, Devon (*A. M. N.*); Jersey (*Sinel*): *Mus. Nor.*

*Distribution.* In the Mediterranean at Goletta, Syracuse, and Spezia (*G. O. Sars*).

The nodulous first joint of tarsus of the legs and the few spines on the margin of the inner uropods distinguish *S. Helleri* from the species which have a somewhat similar antennal scale.

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

1876. *Mysis arenosa*, *G. O. Sars*, Nye Bidrag til Kundskaben om Middelhavets Invertebratfauna, I. Middelhavets Mysider, p. 16, pls. v. and vi.

1883. *Austromysis arenosa*, Czerniavsky, *l. c.* fasc. iii. p. 67.

1885. *Mysis arenosa*, Carus, *l. c.* p. 466.

1886. *Mysis arenosa*, Norman, Fourth Annual Report Fishery Board of Scotland, p. 159; and *Ann. & Mag. Nat. Hist.* ser. 5, vol. xix. 1887, p. 95.

A small species of short and very robust form, much coloured with pigment-cells, especially upon the cephalothorax; pleon shorter than usual. *Eyes* very short, subglobose, scarcely reaching beyond the sides of the cephalothorax; cornea large. *Antennules* with robust peduncle. *Antennal scale* short, subrhomboidal or subovate, scarcely longer than peduncle of antennules; length scarcely exceeding twice the breadth; inner margin more arched than usual, outer margin also slightly arcuate; nearly one half of the total length of scale extended beyond the spine which terminates the naked outer margin. *Legs* with tarsus shorter than preceding

joint, in the anterior pairs composed of four to five articulations, of which the first (as in *S. Helleri*) is very short and nodulously swollen; nail setiform. *Telson* long and not broad, breadth at base scarcely equal to half the length, considerably narrowing to the extremity; cleft of moderate width, extending about one fourth of total length; outer margin with about sixteen spines, the four or five basal spines separated by an interval from the following. *Inner uropods* with numerous spines (20–22) arranged in sets, each set commencing with a small spine, followed by others of gradually increasing length, the most distal spine at (but not on) the extremity—a position most unusual; otolith small. *Fourth pleopods* of male of the structure which usually prevails in this group, but rather shorter than usual. Length 7 millim.

*Hab.* Starcross, Devon, 1884 (*Mr. C. Parker*); Tarbert, Loch Fyne, 1885 (*Mr. G. Brook*): *Mus. Nor.*

*Distribution.* The types of the species were taken by Prof. G. O. Sars at Goletta, in the Mediterranean.

Characteristic features of this species are the nodulous character of the first joint of the tarsus of the legs, by which it may be distinguished from all species except *S. Helleri*; and from that species its smaller size, stouter build, and the narrower telson, shorter antennal scale, and armature of uropods distinguish it; moreover in this species the outer uropod is not more than one fifth longer than the inner, but in *S. Helleri* it is at least one third longer.

## Genus 12. *MYSIS*, Latreille.

Very like in all respects to *Schistomysis*, but *antennal scale* lanceolate (or subulate in *M. mixta*), four and a half to nine times as long as broad, ciliated all round; apex narrowly rounded (or spiniform in *M. mixta*). *Fourth pleopod* of male similar in jointing and general structure to those of *Schistomysis*, and in *M. mixta* in all ways conforming to that genus; but in other species (*M. oculata* and *M. relicta*) the outer branch is much shorter, not more than two or three times the length of inner branch, while the outer flagellum is reduced to a spine-like process and the inner has the first articulation much thickened, so as to almost resemble the joint from which it springs, and the second articulation is reduced to a spine-like process.

*M. oculata*, Fabr., must be regarded as the type of the genus *Mysis*.

*Mysis relicta*, Lovén.

1861. *Mysis relicta*, Lovén, Öfversigt af Vet.-Akad. Förhand. p. 285.  
 1867. *Mysis oculata*, var. *relicta*, G. O. Sars, Hist. Nat. des Crust. d'eau douce de Norwège, i. p. 14, pls. i-iii.  
 1868. *Mysis relicta*, Kessler, Materialia ad cognos. lacus Onegæ, p. 78, pl. i. figs. 1 a-d.  
 1870. *Mysis relicta*, Jarzynsky, Præmissus Catal. Crust. decap. invent. in mari albo &c. p. 317.  
 1872. *Mysis diluvianus*, Stimpson, MS., Hoy, Trans. Wisconsin Acad. vol. i. p. 100 (no description).  
 1871. *Mysis relicta*, S. I. Smith, Amer. Journ. Sci. and Arts, vol. ii. p. 5.  
 1874. *Mysis relicta*, S. I. Smith, Report 1872-3 Commission Fish and Fisheries, p. 643, pl. i. fig. 2.  
 1879. *Mysis relicta*, G. O. Sars, Carcinol. Bidrag til Norges Fauna, I. Monogr. Mysider, p. 73, pl. xxxii.  
 1882. *Mysis relicta*, Czerniavsky, l. c. fasc. ii. p. 8, fasc. iii. p. 51, pl. xv. figs. 17-20, pl. xvi., and pl. xvii. fig. 1.

Form rather slender; anterior portion of cephalothorax subequal in breadth to earlier segments of pleon; hyaline, with arborescent pigment-cells. *Eyes* large, pyriform; peduncle long; almost the whole of the cornea projected beyond the sides of the cephalothorax. *Antennules* having the peduncle long and moderately stout, basal joint as long as the two following. *Antennal scale* in form as a long ellipse, fully one fourth longer than peduncle of antennules and four times as long as broad; greatest breadth subcentral; ciliated all round, and right down the outer margin to the very base; apical joint bearing four setæ. *Legs* having the tarsus much longer than the preceding joint and composed of six to seven articulations, of which the first is much the longest; nail very slender and setiform. *Telson* gradually tapering, with straight sides; length to greatest breadth as 5 to 2; cleft shallow and very broad and open, about one seventh the length of the telson; sides of telson with about sixteen spines, which are crowded towards the base, but widely separated towards the extremity, and the most distal anterior to the cleft. *Inner uropods* with only four or five spines on the anterior two thirds of the inner margin. *Fourth pleopods* of male having the basal joint of moderate length and the inner branch as usual, but the outer branch remarkably short, not twice the length of the inner. Length 18 millim.

*Hab.* Lough Neagh, Ireland (*A. M. N.*).

*Distribution.* Lakes Vettern, Venern, Malar, and other lakes in Sweden (*Lovén & Lilljeborg*); Lake Mjösen, Norway (*G. O. Sars*); Lake Onega, Russia, and Lakes Ladoga and Putko, in Finland (*Jarzynsky*); northern part of the Gulf of Bothnia, but not observed south of Quarken; Kallavesi,

Maaninga sjö, Päijänne, Pielisjarvi, and other lakes in Finland (*Nordquist*)\*.

In America in Lake Michigan (*Stimpson*); Lake Superior, in 12-148 fath. (*S. I. Smith*).

Genus 13. *NEOMYSIS*, Czerniavsky, 1882.

= *Heteromysis*, Czerniavsky, 1882 (nec Smith).

*Antennal scale* subulate, very long and narrow, six to ten times as long as broad (running out into an acute spine-like termination), ciliated on both margins. Labrum acutely pointed in front. *Legs* with multiarticulate tarsus; posterior pairs more strongly built than the anterior and with more articulations in tarsus. *Telson* subtriangular, elongated; apex entire, pointed; margins spined, the spines subequal, no smaller spines alternating with larger. In the male the third as well as the first, second, and fifth *pleopods* are simple, and resemble the same organs in female: fourth pleopod with a short peduncle, not much longer than broad: inner branch as usual in *Mysinae*; outer branch consisting of only two articulations, the first very long, the second rather short, from its end spring two subequal, spiniform, ciliated filaments of no great length.

*Mysis awatschensis*, F. Brandt, *M. americana*, Smith, *Heteromysis mirabilis*, Czern., and *H. intermedia*, Czern., are referable to this genus.

*Neomysis vulgaris* (J. V. Thompson).

(Pl. X. figs. 12, 13.)

1828. *Mysis vulgaris*, J. V. Thompson, Zoolog. Researches, i. p. 30, pl. ii.  
 1844. *Mysis vulgaris*, Zaddach, Synops. Crust. prussicorum prod. p. 3.  
 1853. *Mysis vulgaris*, Bell, Brit. Stalk-eyed Crust. p. 339.  
 1860. *Mysis vulgaris*, P. J. Van Beneden, Recher. sur la Faune littorale de Belgique, Crustacés, p. 13, pl. i.  
 1861. *Mysis vulgaris*, Kröyer, Nat. Tidssk. 3<sup>die</sup> Række, vol. i. p. 21.  
 1879. *Mysis vulgaris*, G. O. Sars, Carcinol. Bidrag til Norges Fauna, I. Monogr. Mysider, p. 24, pl. i.  
 1882. *Neomysis vulgaris*, Czerniavsky, l. c. fasc. ii. p. 23, fasc. iii. p. 81, pl. xviii. figs. 18-22, pl. xxx. figs. 12-14.

*Antennal scale* of great length and very narrow, lanceolate, nine or ten times as long as greatest breadth and three

\* Nordquist (Osc.), "Bidrag till känn. om Crustacéfauna, I. Nagra af Mellersta Finlands Sjöar, 1886," Act. Soc. pro Fauna et Flora Fennica, iii. n. 2; and "Bid. till känn. om Bottniska vikens och norra Österjöns vertebtratfauna," Soc. pro Fauna et Flora Fennica, 17 (1890).

times as long as peduncle of antennules, ciliated all round right down to the base of outer margin; a long very narrow second joint, which is furnished with two setæ on each side and terminates in an acute spine-like point. *Legs* having tarsus longer than the preceding joint, of six articulations in the earlier pairs and of eight in the last; nail slender. *Telson* rather more than twice as long as the breadth at the base, in the form of an elongated triangle, gradually attenuating, but with flexuous side to the extremity, which is very narrow, abruptly truncated, and entire, bearing four spines, the outer pair of large size and the pair between them of about half their length; sides of telson with 20-25 spines, most crowded towards the base and becoming more widely separated distally. *Inner uropods* having a group of densely packed spinules situated on the inner margin just below the large otolith; these spines occupy about one fourth of the total length of the margin. *Third pleopods* of male similar to those of female.

*Hab.* Found all round our coast in brackish water at mouths of rivers, estuaries, salt-marshes, and such like places; but it seems to require more saline ingredients in the water than does *Palæmonetes varians*, Leach, which latter species is often found living in water in which no trace of salt is perceptible and which is occupied by an otherwise freshwater fauna and flora.

Mr. A. O. Walker tells me that about one out of every three specimens received by him from the little river Alt, which is a short way north of the Mersey, was more or less abnormal in the spination of, and in some cases in the form of, the telson. He adds that "a good deal of sewage runs down the river," which may account for the irregular development. These specimens had in some cases the two terminal small spines replaced by spines of similar size to the outer pair. This gave a totally different appearance to the end of the telson, which now appeared narrowly rounded and beset with equal-sized spines. I figure the abnormal terminations of the telson in the case of two specimens which Mr. Walker kindly gave me (Pl. X. figs. 12, 13).

*Distribution.* Norwegian coast, from Christiania to Trondhjem (*G. O. Sars*); Baltic (*Lindström*); Sweden (*Lilljeborg*); Finland (*Cajander*); Denmark (*Krøyer*); Holland (*P. P. C. Hoek*); Belgium (*Van Beneden*); Boulogne, France (*Giard*); Havre; Concarneau (*J. Bonnier*); mouth of the Seine (*de Kerville*); [Black Sea (*Grebnitzky*)?]; White and Murman Seas (*Jarzynsky*)\*.

\* In Wagner (N.), 'Die Wirbellosen des weissen Meeres,' 1885, p. 170.



CORRIGENDA.

- (1) In the first part of this paper, in the Table of Distribution, p. 145, for "*Synmysis*" read "*Macromysis*."  
 (2) At p. 144 and pp. 149-152 *passim*, for "*Cynthilia*" read "*Siriella*."  
 (3) At pp. 147 and 149, for "Subfam. *Cynthiliinæ*" read "Subfam. *Siriellinæ*."

These corrections are necessary from the fact that I find that the genus *Siriella* does not date from 1852, as had been supposed, but was first instituted by Dana in his preliminary descriptions in 'American Journal Sci. and Arts,' ser. 2, vol. ix. p. 4, and that this paper appears to have been published in the early part of 1850; whereas the Brit. Mus. Cat. Brit. Crustacea, which bears J. E. Gray's name, but was "prepared by Mr. Adam White," is signed "June 15, 1850," and must have been published subsequently to that date.

EXPLANATION OF THE PLATES.

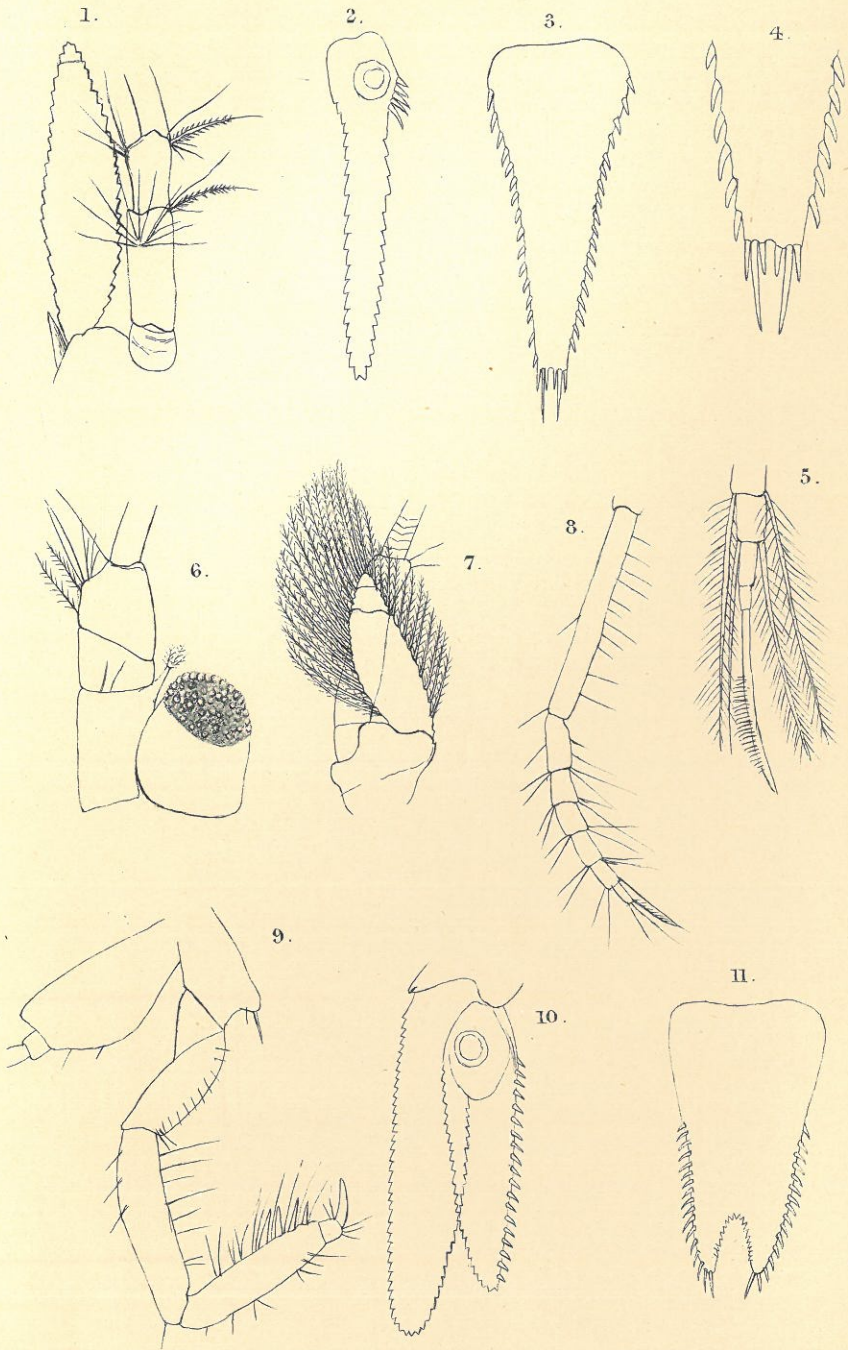
PLATE IX.

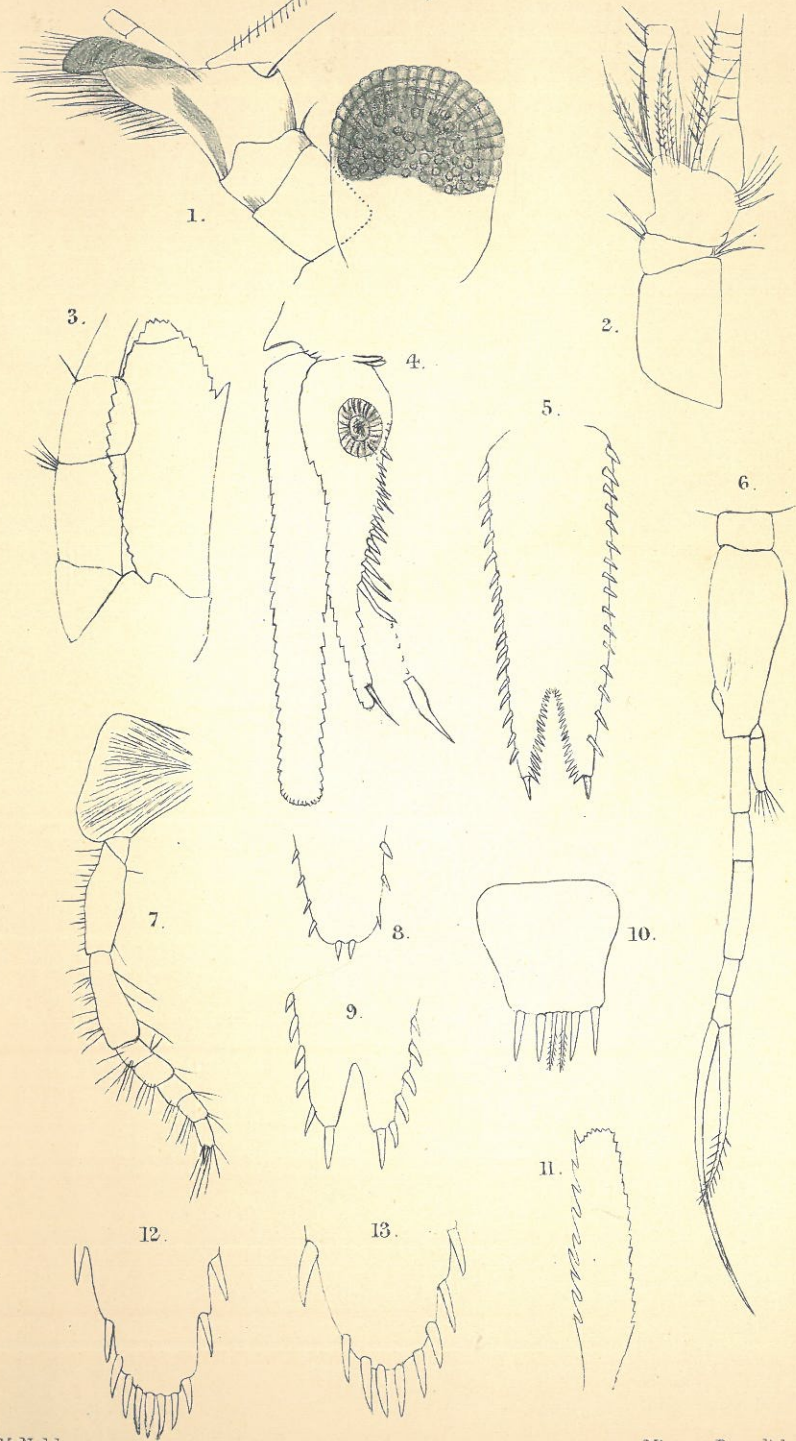
Fig. 1.	<i>Mysidopsis hibernica</i> ,	Norman.	Antenna and its scale.
Fig. 2.	"	"	Inner uropod.
Fig. 3.	"	"	Telson.
Fig. 4.	"	"	Extremity of telson, more magnified.
Fig. 5.	"	"	Terminal joints of outer branch of fourth pleopod of the male.
Fig. 6.	<i>Heteromysis formosa</i> ,	S. I. Smith.	Antennule and eye.
Fig. 7.	"	"	Antenna and scale.
Fig. 8.	"	"	Terminal joints of a posterior leg.
Fig. 9.	"	"	First leg.
Fig. 10.	"	"	Uropod.
Fig. 11.	"	"	Telson.

PLATE X.

Fig. 1.	<i>Schistomysis Parkeri</i> ,	Norman.	Antennule, ♂.
Fig. 2.	"	"	Antennule, ♀.
Fig. 3.	"	"	Antenna and scale.
Fig. 4.	"	"	Uropods.
Fig. 5.	"	"	Telson.
Fig. 6.	"	"	Fourth pleopod, ♂.
Fig. 7.	"	"	Endopodite of a leg.
Fig. 8.	<i>Mysidopsis gibbosa</i> ,	G. O. Sars.	End of telson.
Fig. 9.	"	<i>angusta</i> , G. O. Sars.	End of telson.
Fig. 10.	<i>Erythrops elegans</i> ,	G. O. Sars.	Telson.
Fig. 11.	"	<i>serrata</i> , G. O. Sars.	Antennal scale.
Fig. 12, 13.	<i>Neomysis vulgaris</i> ,	J. V. Thompson.	Abnormal developments of the end of the telson.

The figures in the foregoing Plates are of parts magnified to various degrees of enlargement.





outer as long as cephalothorax. *Antennal scale* subrhomboidal, slightly longer than peduncle of antennules, three times as long as broad; external margin short, and this portion of the scale extended beyond the spine which terminates the outer margin; typically almost equal to half of the total length, but sometimes proportionately shorter. *Tarsus* of legs rather longer than preceding joint, consisting of five to seven articulations; nail slender, setiform. *Telson* in form and armature nearly as in *S. spiritus*, but the cleft somewhat deeper and occupying about one fourth of the total length. *Inner uropod* (not twisted at the extremity as in *S. spiritus*) with about sixteen well-separated rather slender spines on the inner margin; otolith large. Length 18 millim.

*Hab.* Dredged in 40-50 fath. 5-8 miles off Balta, Shetland; off Seaham, on the Durham coast; off Valentia, Ireland (*A. M. N.*); Banff (*T. Edward*); 25 miles off May Island, in the Firth of Forth, 35 fath. (*Dr. John Murray*); Firth of Forth (*T. Scott*): *Mus. Nor.* Liverpool Bay (*A. O. Walker*).

*Distribution.* Bukken, Bergen Fiord (*A. M. N.*); Dröbak and several places in South and West Norway, and among Lofoten Islands (*G. O. Sars*); Denmark (*Meinert*); Concarneau, France (*Bonnier*); mouth of the Seine (*de Kerville*); Holland (*P. P. C. Hoek*, who records both *S. ornata* and *S. Kervillei*).

*Mysis Kervillei* is founded on large specimens of *S. ornata* in which the eye is proportionately larger, the antennal scale, more especially the part before the extremity of lateral margin, longer, and the number of articulations in tarsus of legs seven. But among specimens kindly sent me by M. de Kerville I find some with the spine-point of the scale on a level with the end of the peduncle of antenna and the tarsus five-jointed; and in specimens from other localities I find considerable variation both in the scale and tarsus, the latter in the front feet having sometimes seven articulations besides the nail.

### 3. *Schistomysis Parkeri*, sp. n. (Pl. X. figs. 1-7.)

*Mandible* having the penultimate and last joints of the palp remarkably broad, the latter more so than in any other member of the genus, scarcely more than twice as long as broad. *Eyes* nearly globular, length scarcely exceeding the breadth. *Antennules* with peduncles short, first joint equalling the two following, second joint transversely narrowly triangular, third joint expanded and very broad, breadth exceeding