

*From the ANNALS AND MAGAZINE OF NATURAL HISTORY,
Ser. 6, Vol. XIII., February 1894.*

H. NOUVEL

A MONTH ON THE TRONDHJEM FIORD.

BY

THE REV. CANON NORMAN, M.A., D.C.L., F.R.S., ETC.

genus have been described—*B. Pauschii*, Bucholz*, *B. Payeri*, Heller†, *B. leucopsis*, G. O. Sars‡, and *B. nana*, S. I. Smith§; and the present species, which is the type of the genus.

Bythocaris simplicirostris appears to be extremely rare. I dredged two specimens in 250–300 fathoms, Rödberg. Sars described the species from a single female dredged in 250 fathoms, Lofoten Islands. Two mutilated examples were taken by the Norwegian North-Atlantic Expedition, one between Finmark and Bear Island in 191 fathoms, the other west of Spitzbergen in 416 fathoms.

B. simplicirostris is distinguished from the more recently described species by the following characters:—

Carapace with only a very slight central carina, suddenly terminated anteriorly in a notch and armed with a spine. Frontal area considerably projecting; middle spine-process (rostrum) subulate, round, smooth, acute, extending forwards to beyond the middle of the basal joint of the antennules, and longer than the long eyes; the flanking lateral spine-processes acute and well-developed, about one third the length of the central. Eyes well developed, on long peduncles, when laterally projected extending beyond the sides of the carapace. Scale of antennæ of great size, as long as the entire carapace and three times as long as its own greatest breadth; apically well rounded and greatly overtopping the spine-process of the outer margin. Telson slightly emarginate at the extremity.

12. *Cryptocheles pygmaea*, G. O. Sars. (Pl. XII. figs. 2–5.)

1869. *Cryptocheles pygmaea*, G. O. Sars, "Nye Dybvandskrustaceer fra Lofoten" (Vidensk.-Selsk. Forhand.), p. 6 (separate copy).

Rödberg, on the precipices, in 150–250 fathoms. I have also dredged it in 200 fathoms near Lervig, on the Hardanger Fiord. Sars's types were from the Lofoten Islands in 120–300 fathoms; he has also procured it at Hesthammer, in the Hardanger Fiord, in 100–150 fathoms, and it was dredged by the Norwegian North-Atlantic Expedition at the mouth of the Sogne Fiord, in 200 fathoms. It has as yet only been found on the Norwegian coast.

* *Hippolyte Pauschii*, Bucholz, Die zweite Deutsche Nordpolarfahrt, 1869 und 1870, vol. ii. 1874, p. 277, pl. i. fig. 1.

† *Hippolyte Payeri*, Heller, Crustaceen, Pycnogoniden, und Tunicaten Oesterr.-Ungar. Nordpol-Exped. p. 2, pl. i. figs. 1–4.

‡ *Bythocaris leucopsis*, G. O. Sars, Den Norske Nordhavs-Exped. 1876–78, Crustacea, I., 1885, p. 27, pl. iii. figs. 1–20.

§ *Bythocaris nana*, S. I. Smith, "Report Decapod Crustacea 'Albatross,' 1884," Annual Rep. Comm. Fish and Fisheries, 1885, p. 56 (separate copy), pl. xii. fig. 2.

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1894 (Auk)

CRUSTACEA.

I have in an earlier part of this paper made a few remarks on the higher Crustacea of the north of Europe and the Arctic seas, and shown that the proportionate number of Brachyura and Anomura rapidly decreases as we approach the Arctic Ocean. The following is the list of species in the Trondhjem Fiord which have been either recorded by Herr V. Storm, the Curator of the Trondhjem Museum, who has done much dredging, or found by myself:—

Cancer pagurus, <i>Linn.</i>	Eupagurus pubescens, <i>Kröyer.</i>
Carcinus mænas, <i>Linn.</i>	— Bernhardus, <i>Linn.</i>
Portunus depurator, <i>Linn.</i>	Galathea strigosa, <i>Linn.</i>
Hyas araneus, <i>Linn.</i>	— squamifera, <i>Fabr.</i>
Inachus dorsettensis, <i>Penn.</i>	Galathodes tridentatus, <i>Esmark.</i>
— coarctatus, <i>Leach.</i>	Munida rugosa, <i>Fabr.</i>
Stenorhynchus rostratus, <i>Linn.</i>	— tenuimana, <i>G. O. Sars.</i>
Lithodes maia, <i>Linn.</i>	

It is not likely that this list can in the future be materially extended, since the only species which have been met with to the north of Trondhjem and not already found there are *Galathea nexa*, Embleton, and *Galathea intermedia*, Lilljeborg.

I have drawn up the annexed Table, which is intended to show the distribution of all the higher Crustacea known on the coasts of Norway, including Finnmark. In the Brachyura and Anomura, a glance will show as the eye passes over the first ten columns how the number of species dies out northwards, while the well-filled columns after the tenth testify to the large proportion of the Norwegian forms which occur southwards. Passing on to the Macrura we come upon many species which are not known southwards, while correspondingly the Arctic columns are more filled in. The gaps in the southern columns among the Schizopoda and Cumacea are yet more conspicuous, partly because Professor G. O. Sars has paid so much attention to these on the Norwegian coast, partly also because very many of the species are deep-water forms, living below 100 fathoms, which are not likely to be found in the shallower water which occurs round Sweden, Denmark, and Britain.

The list of species is, with a few alterations in nomenclature and some additions made from the discoveries of the Norwegian North-Atlantic Expedition, copied from that of Sars, given in his 'Oversigt af Norges Crustaceer,' 1882.

The distribution of species has been filled in from all the leading books and papers on the Crustacean fauna of the seas

referred to; and in every case I have indicated the authority on which the species are marked in the particular columns.

N. indicates that the species has been found or identified by myself. It does not apply to any species which, though in my collection, have been received from those whose authority is recognized in this table. There is an exception in the British column, where N. stands for those forms which I have identified whether collected by myself or others. In this way are notified the following Mysidea and Cumacea which have recently been added to our fauna by Mr. Thomas Scott, the energetic naturalist of the Scotch Fishery Board:—*Erythropus Goëssii*, *E. elegans*, *Petalomera declivis*, *Campylaspis rubicunda*, and *C. costata*. Two species in this column have not previously been recorded as British:—*Mysideis insignis*, G. O. Sars, of which I have found a specimen, from a dredging I took in 112 fathoms off Valentia, Ireland, in 1870; and *Campylaspis sulcata*, G. O. Sars, dredged by me in 1885 off Little Cumbrae, in the Firth of Clyde.

Authorities relied on in the Table.

Columns 1-6.—Norway (including Finmark).

- A. Aurivillius (C. W. S.). "Hafsevertebrater från nordlicaste Tromsø Amt och Vestfinmarken," Svenska Vet.-Akad. Hand. vol. ii. 1866.
- Bk. Boeck (A.). As mentioned by G. O. Sars in paper from which the following list of species is taken.
- Bv. Bovallius (C.). "Anmärkningar om Portunidsläktet Thranites," Öfvers. af K. Vet.-Akad. Förhand. Stockholm, 1881, p. 9.
- Da. Danielssen. "Beretning om en Zool. Reise, 1857," 1859; and Danielssen and Boeck (A.), "Besk. af nogle til Crustacea Decapoda hørende Norske Arter," 1872.
- Dü. Von Düben. *Fide* G. O. Sars (see below).
- S. Sars (G. O.). Whose very numerous papers have been carefully consulted.
- MS. Sars (Michael). "Overs. over de i den Norsk-arctiske Region forekommende Krybsdyr," Videns.-Selsk. Förhand. 1858.
- ISS. Schneider (I. Sparre). "Unders. af dyrelivet i de arktiske fjorde: II. Crustacea og Pyenog. indsamlede i Knænanngsfjorden," 1851-1855.
- VS. Storm (V.). "Kong. Norske Videns.-Selsk. Skrifter," Trondhjem, 1879, p. 109.

Column 7.—Greenland.

- H. Hansen (H. J.). "Oversigt over det vestlige Grønlands Fauna af malakostraka Havskrebsdyr," Vidensk. Meddel. fra den Foren. i Kjøbh. 1887.

Columns 8 and 9.—Iceland and Spitsbergen.

- S. Sars (G. O.). These columns are filled in from the table of distribution in 'Den Norske Nordhavs-Exped. 1876-78, Crustacea, ii.,' 1886, p. 83.

Column 10.—Kara Sea.

- H. Hansen (H. J.). 'Oversigt over de paa Dijnphna-Togtet indsamlede Krebsdyr,' 1886.
S. Sars (G. O.). From the same source as in columns 8 and 9.
Sx. Stuxberg (A.). "Faunan på och Kring Novaja-Semlja," 'Vega' Exped. Vetenskapliga Iakttagelser, vol. v. 1886.

Column 11.—Sweden.

- G. Goës. "Crust. decap. podoph. marina Sueciæ etc. enumerat A. Goës," *Oefvers. af K. Vet.-Akad. Förhand.* 1863.

Column 12.—Denmark.

- M. Meinert (Fr.). "Crustacea, Isopoda, Amphipoda, et Decapoda Daniae," *Naturhist. Tidsskrift*, 3^{de} Rækkes, vol. xi. 1877, p. 57, vol. xii. 1880, p. 465; 'Det Videnskabelige Udbytte af Kanonbaaden 'Hauchs' Togter, III. Crustacea Malacostraca,' 1890.

1893

Column 13.—British Isles.

- Kin. Kinahan (J. R.). *Nat. Hist. Review*, vol. vi. 1858, Proc. Societies, p. 40.
B. Bell. 'Brit. Stalk-eyed Crustacea.' Cf. G. O. Sars, "Overs. af Norges Crustaceer, I.," *Vid. Selsk. Förhand.* Christ. 1882, p. 43, pl. i. fig. 4.
G. Goodsir (H.). *Vide* Bell, 'Brit. Stalk-eyed Crustacea,' p. 326.

Column 14.—Mediterranean.

- C. Carus (V.). 'Prodromus Faunæ Mediterraneæ,' vol. i. 1885.

Column 15.—North-east America.

- Sm. Smith (S. I.). "Stalk-eyed Crustaceans of the Atlantic Coast of North America, north of Cape Cod," *Trans. Connect. Acad.* vol. v. 1879, p. 27.

		Sm	Sm	Sm		Sm	Sm
	N C C	(C ²)	ZZZ	Z C C	Z Z	C C	
	ZZZZ	ZZZZZZZZZZZZZZZZZZ		Z B Z			
	M M M	M M M M	M M M M M M	M			
	G G G	G G	G	G	G G G	G	
			II				
			S				
			Z				
		II	Z				
	M Z	Z M	Z				Z
		M M	Z		M S		S
	Da	Z Da	Z		Z	Z Z S	S
	Z	Z Z Z Z	Z Z	Z	Dü	Z S	Z
	Z Z Z	Z Z Z Z	Z Z Z Z Z Z	Z Z Z Z Z Z			Z
	Z Z	Z Z Z	Z	Z Z Z Z Z Z Z Z	Z Z		S Z Z Z

- Saxamathia Carpenteri, *Norman*
 Imachus denticatus, *Fenn.*
 — denticatus, *Leach*
 Stenchyelus rostratus, *Linna.*
- ANOMURA.
- Lithodes maia, *Linna.*
 Eupagurus Bernhardus, *Linna.*
 — Pridemvii, *Leach*
 — pubescens, *Kroyer*, = *P. Kroyeri*, *Stimp.*
 — indiculosus, *Raut.*, = *P. tricornatus*, *Norman*
 — euanensis, *Thomp.*, = *P. Lucasi*, *Heller*
 Anapagurus levis, *Thomp.*
 — chirocanthus, *Lillj.*, = *P. ferrugineus*, *Norman*
 Porcellana longicornis, *Linna.*
 Galathea strigosa, *Linna.*
 — squamifera, *Fabé.*
 — nexa, *Fabricius*
 — dispersa, *Fabé*
 — intermedia, *Lillj.*
 Galathea tridentatus, *Fennark.*
 Munida rugosa, *Fabé.*
 — Rondeletii (*Bell.*), *G. O. Sars*
 — tenuimana, *G. O. Sars*
- MACRURA.
- Calcearis Macandrewi, *Bell.*
 Gebia stellata, *Mont.*, = *G. littoralis*, *Risso*
 Astacus fluviatilis, *Rond.*
 Homarus vulgaris, *Bell.*
 Nephrops norvegicus, *Linna.*
 Oragon vulgaris, *Linna.*
 — Allmanni, *Kimbern.*
 Chonophylus echinulatus, *M. Sars*, = *C. serratus*, *Norman*
 — nanus, *Kroyer*

	N	U	M	X	T	S	Z	L	V	N	S ^m	S ^m	S ^m	S ^m	S ^m	S ^m
Edwardi, Goodair																
Cyclaspis longicaudata, G. O. Sars																
Iphione trispinosa, Bate																
Lamprops fasciata, G. O. Sars																
fasciata, G. O. Sars																
Hemilamprops rosea, Norman																
assimilis, G. O. Sars																
multiplicata, G. O. Sars																
cristata, G. O. Sars																
Platyaspis typica, G. O. Sars																
Leucon nasicus, Krøyer																
nasicoides, Lilljeborg																
fulvus, G. O. Sars																
acutirostris, G. O. Sars																
pallidus, G. O. Sars																
Eudorella truncatula, Bate, = E. inermis, Meinert, ♂																
emarginata, Krøyer																
hirsuta, G. O. Sars																
Eudorellopsis deformis, Krøyer																
Diastylis Rathkei * Krøyer																
cornutus, Boeck																
lucifer, Krøyer																
rugosus, G. O. Sars, = D. strigata, Norman, ♂																
spinulosus, Heller																
echinatus, Bate																
Edwardi, Krøyer																
Goodsiri, Bell																
tumidus, Lillj.																
levi, Norman																
serratus, G. O. Sars																
biplicatus, G. O. Sars, = D. lamellosa, Norman																

* Aurivillius (l. c.) records *Diastylis ambigua*, Lilljeborg, and *Diastylis 4-plicata*, Lilljeborg, from Finmark. I do not know where these are described.

Table of Distribution of the Higher Crustacea of Norway.

	1.	S. Norway.	.....
	2.	W. Norway to lat. 62° N.	.....
	3.	Lat. 62° N. to Arct. Cir.	.....
	4.	Arct. Cir. to W. Finmark.	.....
	5.	W. Finmark.	.....
	6.	E. Finmark.	.....
	7.	Greenland.	.....
	8.	Iceland.	.....
	9.	Spitsbergen.	.....
	10.	Kara Sea.	.....
	11.	Sweden.	.....
	12.	Denmark.	.....
	13.	Brit. Isles.	.....
	14.	Mediterr.	.....
	15.	N.E. Amer.	.....

Diastylis resimus, Kröyer
Leptostylis longimanus, G. O. Sars
macrurus, G. O. Sars
villosus, G. O. Sars
ampullaceus, Lillj.
Pseudocuma cervaria, J. van Ben., = Cuma bella, Meinert
Petalomera declivis, G. O. Sars
Cumella pygmaea, G. O. Sars, = Cuma agilis, Norman.
Campylaspis rubicunda, Lillyborgy
affinis, G. O. Sars
costata, G. O. Sars
undata, G. O. Sars
sulcata, G. O. Sars
verrucosa, G. O. Sars
horrida, G. O. Sars

[To be continued.]

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By the Rev. Canon NORMAN, M.A., D.C.L., F.R.S., &c.

[Continued from p. 164.]

[Plate XII.]

[THE reader is requested to make the following corrections in the preceding Table of Distribution:—

P. 162, for *Heteromysis* read *Hemimysis*.

for *Chiromysis* read *Heteromysis*.

P. 163. The S in column 14 should be opposite *Eudorella truncatula* instead of *E. emarginata*.

P. 164, column 13. Put N instead of ? opposite *Campylaspis costata*.]

This Table of Distribution of the Higher Crustacea of Norway contains one hundred and seventy-eight species. The distribution of these species may be summed up as follows:—

Species which occur both to the north and to the south of Norway	30
Species known only to the north of Norway	19
Species known only to the south of Norway	104
Species here recorded only as Norwegian	25

178

But of these last twenty-five species *Bythocaris Payeri*, Heller, has a wide distribution in the great depths of the cold area of the North Atlantic, and *Euphausia pellucida*, Dana, is an oceanic form with world-wide distribution; and although this species is not marked in the Mediterranean column, it should have been so, since *Euphausia Mülleri*, Claus, is a synonym.

Deducting these two species, we have twenty-three remaining which are as yet unknown beyond the Norwegian seas.

Of the 178 Norwegian species, 121 are known in British seas and 57 reach the Mediterranean, while 44 occur on the N.E. coast of North America. A study of the table will show that the species common to Norway and N.E. America are, with the exception of *Carcinus mænas*, *Eupagurus Bernhardus*, and *Crangon vulgaris*, either Arctic or deep-water forms.

The Isopoda of Norway differ in general character from those of the British sea by the fact that the family Sphaeromidae is only represented by the single species *Limnoria lignorum*; this family is altogether unknown in the Arctic seas, and in Denmark only two forms occur, *Limnoria lignorum* and *Sphaeroma rugicauda*. On the other hand, the

families Tanaidæ, Munnidæ, and Munnopsidæ are largely represented in Norway; the first of these has been little studied in our own seas, while the two latter families are lovers of a soft muddy bottom and, for the most part, of a considerable depth of water, conditions rarely met with on or off our coasts; but there can be no doubt that our fauna will hereafter be enriched by many additions in these three interesting groups.

The Norwegian seas are very rich in Amphipoda, and here again many groups are more largely represented than in British seas on account of the greater depth of water and the nature of the bottom of the fiords; but there can be no question that the much larger number of Amphipods known in Norway as compared with the British fauna is due in no small degree to the fact that the Norwegian Amphipoda have been more thoroughly studied than the British. The following is a comparative statement of the number of Amphipoda at present known in Norway, Denmark, Britain, and the Mediterranean; the species of Norway are from Sars and Boeck, those of Denmark are taken from Meinert's works, those of Britain are from my own computation (including some unrecorded species), those of the Mediterranean are on the authority of Claus, Della Valle, and Mayer.

	Norway.	Denmark.	Britain.	Mediterranean.
Hyperina	9	1	10	21
Gammarina . .	333	107	214	106
Caprellina	17 (?)	5	12	16
	<hr/>	<hr/>	<hr/>	<hr/>
	359	113	236	143

When we pass to the consideration of the Entomostraca, we find that these, with the exception of one group, have been more studied and are better known in the British fauna and in that of the Mediterranean than in Scandinavia. With respect to Copepoda of the latter country the only papers we have are those of Boeck, published many years ago. The Ostracoda of the Norwegian seas have, however, been worked at both by Professor G. O. Sars and myself. One hundred and eighteen species of marine Ostracoda are now known from that coast * and one hundred and forty-six from our own †.

* Norman (A. M.), "Notes on the Marine Crustacea Ostracoda of Norway," *Ann. & Mag. Nat. Hist.* ser. 6, vol. vii. 1891, p. 108.

† Norman and Brady, "Mon. Marine and Freshwater Ostracoda of the North Atlantic and North-western Europe," Section I., Podocopa, *Trans. Roy. Dublin Soc.* ser. 2, vol. iv. 1889, p. 63. To the species of Podocopa there enumerated are added those of the other sections of the group.

BRACHYURA.

1. *Portunus depurator*, Linn.
One small specimen, Trondhjem.

ANOMURA.

2. *Eupagurus pubescens*, Kröyer.
Trondhjem and Rödberg.

3. *Galathea strigosa*, Linn.

Two young examples, Laminarian zone, Rödberg.

Professor M. Sars found this species as far north as the North Cape ('Oversigt over de i den Norsk-arctiske Region forekommende Krebsdyr,' 1858).

4. *Galathodes tridentatus*, Esmark.

? 1852. *Galathea serricornis*, Lovén, Öfv. Vet.-Akad. p. 22 (? junior).

1856. *Galathea tridentata*, Esmark, Skand. Naturf. Möte, p. 239.

1882. *Galathodes tridentata*, G. O. Sars, "Oversigt af Norges Crustaceer, I," Vidensk.-Selsk. Forhand. Christ. p. 43 (separate copy), pl. i. fig. 3.

On the precipices at Rödberg down to 300 fathoms, as well as in similar localities in Kors and Hardanger Fiords.

This species would seem to feed on *Lophohelia prolifera*. It is usually found clinging to that coral or met with in its immediate neighbourhood.

MACRURA.

5. *Calocaris Macandreae*, Bell.

In 150-300 fathoms, Trondhjem and Rödberg; also Oster Fiord, near Bergen, 400 fathoms, and off Batalden, near Florö, 200-300 fathoms.

6. *Cheraphilus nanus*, Kröyer.

Trondhjem, 150 fathoms.

This is *Crangon bispinosus*, Westwood.

7. *Pontophilus*, sp.

I did not find any mature specimen of this genus, but an example occurred in the postlarval stage (see G. O. Sars, "Bidrag til Kundskaben om Decapodernes Forvandlinger, III. Fam. Crangonidæ," Archiv f. Mathem. og Naturv. 1890, pl. iv. figs. 19, 20), in which the telson and second leg are as

figured by Sars, while the carapace has two dorsal spines, a rostrum as long as the eye, and traces of lateral carinæ.

8. *Spirontocaris polaris*, Sabine.

1824. *Alpheus polaris*, Sabine, Supp. to Appendix of Parry's Voyage, p. 238, pl. ii. figs. 5-8.
 1843. *Hippolyte polaris*, Krøyer, Monog. Fremst. af Hippolyte's Nordiske Arter, p. 324, pl. iii. figs. 78-81, pl. iv. fig. 82, ♀.
 1843. *Hippolyte borealis*, id. ibid. p. 330, pl. iii. figs. 74-77, ♂.
 1835. *Hippolyte borealis*, Owen, in Append. Ross's Second Voyage, p. 84, pl. B. fig. 3, ♂.
 1867. *Hippolyte cullata*, Norman, "Report Exploring Coasts of Hebrides," Brit. Assoc. Report, 1866, p. 200.
 1869. *Hippolyte cullata*, Norman, "Last Report Dredging Shetland," Brit. Assoc. Report, 1868, p. 265.
 1879. *Hippolyte polaris*, S. I. Smith, "Stalk-eyed Crustaceans Atlantic Coast of N. America," Trans. Connect. Acad. vol. v. p. 80, pl. xi. figs. 1-4.

Trondhjem and Rödberg, 40-300 fathoms. I have the species also in my collection from Hardanger Fiord, off Lervig, and in Stoksund; Norddals Fiord, Florö; Svolvær, Lofoten Islands; Varanger and Bog Fiords, East Finmark; from the Minch and off Shetland: all dredged by myself. Also from Greenland (*'Valorous' Exped.*); lat. 60° 14' N., long. 4° 30' W., 290 fathoms (*'Porcupine,'* 1869, Stat. 78); and off Halifax, N.E. America (*S. I. Smith*).

9. *Spirontocaris securifrons*, Norman.

Trondhjem, 150 fathoms.

This is a much more common species than *S. spinus*, Sow. In British seas the latter is very rare; the former I have from Northumberland and Durham coasts, Shetland, the Minch, Loch Fyne, Firth of Clyde, &c. in our own seas; from most of the fiords in which I have dredged in West Norway and Finmark; also from Tromsö (*I. Sparre Schneider*), and off Salem, Massachusetts Bay, 90 fathoms (*S. I. Smith*).

10. *Spirontocaris puriola*, Krøyer.

Rödberg, 3-10 fathoms.

11. *Bythocaris simplicirostris*, G. O. Sars. (Pl. XII. fig. 1.)

1869. *Bythocaris simplicirostris*, G. O. Sars, "Nye Dybrandscrustaceer fra Lofoten" (Vidensk.-Selsk. Forhand. Christ. 1869), p. 5 (separate copy).

For generic characters see G. O. Sars, 'Den Norske Nordhavs Exped. Crustaceer,' 1885, p. 26. Five species of the

genus have been described—*B. Panschii*, Bucholz*, *B. Payeri*, Heller†, *B. leucopsis*, G. O. Sars‡, and *B. nana*, S. I. Smith§; and the present species, which is the type of the genus.

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B. simplicirostris is distinguished from the more recently described species by the following characters:—

Carapace with only a very slight central carina, suddenly terminated anteriorly in a notch and armed with a spine. Frontal area considerably projecting; middle spine-process (rostrum) subulate, round, smooth, acute, extending forwards to beyond the middle of the basal joint of the antennules, and longer than the long eyes; the flanking lateral spine-processes acute and well-developed, about one third the length of the central. Eyes well developed, on long peduncles, when laterally projected extending beyond the sides of the carapace. Scale of antennæ of great size, as long as the entire carapace and three times as long as its own greatest breadth; apically well rounded and greatly overtopping the spine-process of the outer margin. Telson slightly emarginate at the extremity.

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† *Hippolyte Payeri*, Heller, Crustaceen, Pycnogoniden, und Tunicaten (Esterr.-Ungar. Nordpol-Exped. p. 2, pl. i. figs. 1–4.

‡ *Bythocaris leucopsis*, G. O. Sars, Den Norske Nordhavs-Exped. 1876–78, Crustacea, I., 1885, p. 27, pl. iii. figs. 1–20.

§ *Bythocaris nana*, S. I. Smith, "Report Decapod Crustacea 'Albatross,' 1884," Annual Rep. Comm. Fish and Fisheries, 1885, p. 56 (separate copy), pl. xii. fig. 2.

This is probably the smallest *Macruran* known, measuring only about 13 millim. long.

Outer maxillipeds (fig. 4) strongly developed, with a small palp at the base, last joint longer than penultimate, on the anterior side furnished with semiverticils of setæ, extremity terminating in a very strong triangular spine, at the base of which is projected to about one third of its length a dentated lobe. First feet very short (fig. 5), hand greatly elongated, nearly twice the length of the wrist, attenuated distally, the finger and thumb extremely small and weak. Second feet slender and weak; wrist longer than the anterior portion of limb, composed of seven articulations; hand very minute and the chela so small that it can only be seen when the limb is mounted and microscopically examined. Remaining feet simple. The front portion of the carapace is dorsally keeled and spined, spines about four; rostrum (fig. 3) about half as long as the carapace, nearly horizontal, narrow, above with "8-12" spines, beneath unarmed, except sometimes a small tooth at the apex. No spine over the eye, but three minute spines below. Antennal scale elongated, rhomboidal, with a spine about the middle of the outer margin. Epimera of first three segments of pleon very large in the female, especially the second. Telson shorter than uropods, elongated-ovate, with numerous spines on the sides, distally truncate, and furnished with six spines. "Branchiæ utrinque 5 structura singulari, laminas formantes ovatas in superficie modo exteriori plicas 4-7 ut rudimenta foliolorum præbentes; branchia posterior ceteris major et forma subreniformi" (*G. O. Sars*).

Both *Bythocaris* and *Cryptocheles* have only a few ova, and these are very large; and *G. O. Sars* has recorded that in these genera the young issue from the egg with the full complement of limbs, and do not undergo any metamorphosis subsequently. Thus these genera differ from all shallow-water *Macrura*. In most deep-water *Macrura* the eggs are few and large, and it is probable therefore that the development is similar in character to that of *Bythocaris* and *Cryptocheles*. [Notes by Prof. S. I. Smith on the large size of the eggs of abyssal Crustacea will be found in papers printed in *Ann. & Mag. Nat. Hist.* ser. 5, vol. xiv. 1884, p. 183; "Report Decapod Crustacea 'Albatross' Dredgings, 1884," in *Ann. Rep. Comm. Fish and Fisheries, 1885 (1886)*, p. 13 (separate copy); *Ann. & Mag. Nat. Hist.*, ser. 5, vol. xvii. 1886, p. 197.]

13. *Pandalus brevirostris*, Rathke.

Rödberg, 150 fathoms.

Two specimens, both presenting peculiarities. One is more slender in form than usual and has the rostrum less deep and much longer, equal to twice the length of the eye; it bears ten teeth above, of which six are articulated on the carapace and two are situated beyond the extremity of the eye; there is usually a cilium in front of each tooth of the carapace, but in this specimen it is absent; there are three teeth on the underside of the rostrum of larger size than usual. The second specimen has the rostrum somewhat shorter, with eight teeth above of which five are on the carapace, and four below, the two proximal of which are of good size and at some distance from the extremity.

14. *Caridion Gordoni*, Bate.

Rödberg, 150 fathoms.

15. *Pasiphaea tarda*, Kröyer.

1845. *Pasiphaea tarda*, Kröyer, Naturhist. Tidssk. Anden Række, vol. i. p. 453.

1844? *Pasiphaea tarda*, Kröyer, Voyage en Scandinavie &c. pl. vi. figs. A, B, a-o*.

1868. *Pasiphaea norvegica*, M. Sars, Bidrag til Kunds. om Christianiafjordens Fauna, p. 42, pls. iv. and v. figs. 65-90.

1882. *Pasiphaea tarda*, G. O. Sars, "Overs. af Norges Crustaceer, I." (Vidensk.-Selsk. Forhand. Christ.), p. 42 (separate copy).

A single specimen off Rödberg in about 300 fathoms.

The chief points which distinguish this species from *P. sivado*, our British species, are that the telson is cleft at the extremity and that there is no spine over its base on the hinder margin of the preceding segment. The segments are also strongly keeled dorsally.

Both *P. sivado* and *P. tarda* are usually found in depths exceeding 80 fathoms; but on one occasion, about forty years ago, I found the former in enormous quantities in stake-nets which had been set between tide-marks at Clevedon, Somerset; and these could not have temporarily come out of deep water, since the whole of the Bristol Channel is shallow.

MYSIDÆA.

Descriptions and admirable figures of the following Schizopods will be found in G. O. Sars's "Monog. over de ved Norges Kyster forekommende Mysider," and descriptions of such as are found in Britain in my paper on British Mysidæ in Ann. & Mag. Nat. Hist. ser. vi. vol. x. 1892.

* The generic name in the Voyage en Scand. is spelt *Pasiphaea*, and this is the spelling of Savigny, who instituted the genus.

16. *Boreomysis tridens*, G. O. Sars.

In 3-300 fathoms, Trondhjem and Rödberg. Some young examples were taken among *Laminariae* in very shallow water, but close at hand there was a precipice descending to 250 fathoms.

17. *Erythropus microphthalma*, G. O. Sars.

A single specimen off Trondhjem, in 150 fathoms.

18. *Parerythropus abyssicola*, G. O. Sars.

In considerable numbers, Rödberg, 250-300 fathoms.

19. *Mysidopsis didelphys*, Norman.

Trondhjem, between Munkholmen and the harbour.

20. *Pseudomma roseum*, G. O. Sars.

Among *Lophohelia* and Alcyonarians on the precipices and on the bottom of the fiord, Rödberg.

21. *Pseudomma affine*, G. O. Sars.

One only, 250-300 fathoms, Rödberg.

22. *Mysideis insignis*, G. O. Sars.

Rödberg, 150 fathoms, one only.

23. *Hemimysis abyssicola*, G. O. Sars.

Rödberg, 250-300 fathoms, abundant.

24. *Macromysis inermis*, Rathke.

Trondhjem and Rödberg, 3-5 fathoms.

25. *Schistomysis ornata*, G. O. Sars.

Rödberg, 3-5 fathoms.

CUMACEA.

I do not in the following list give reference to such species as are described in G. O. Sars's paper "Om den aberrante Krebsdyrgruppe Cumacea og den Norske Arter" (Vidensk.-Selsk. Forhand. 1864) except when other papers contain figures of the species.

26. *Lamprops fasciata*, G. O. Sars.

One specimen in 1 fathom, west bay at Trondhjem.

There are two species with which *E. producta* might be confounded; from *E. furcata* and *E. latirostris* the distinctly separated segments which precede the last will at once distinguish it, as well as the character of the basal joint of the antennules and the exact structure of the rostrum.

Rödberg, on the precipices among Alcyonarians, in about 150 fathoms.

Sars described the species from a single specimen, which was scarcely more than half the length of those found by me; and as in that description there is no allusion made to the structure of the antennules, I should have failed to recognize the species had it not been that I had the advantage of direct comparison with specimens kindly given me by Prof. G. O. Sars, and obtained by him in West Norway.

[To be continued.]

EXPLANATION OF PLATE XII.

- Fig. 1. *Bythocaris simplicirostris*, G. O. Sars. Dorsal view of anterior portion of carapace, enlarged.
 Fig. 2. *Cryptocheles pygmaea*, G. O. Sars. Enlarged about three diameters.
 Fig. 3. Ditto. Rostrum.
 Fig. 4. Ditto. Outer maxilliped.
 Fig. 5. Ditto. First foot.
 Fig. 6. *Campylaspis horrida*, G. O. Sars, ♀. Enlarged.
 Fig. 7. Ditto. Dorsal view of carapace.
 Fig. 8. *Campylaspis verrucosa*, G. O. Sars, ♂. Enlarged.
 Fig. 9. *Campylaspis costata*, G. O. Sars, ♂. Enlarged.

