

THIRD REPORT* on the HIGHER CRUSTACEA
of the L.M.B.C. DISTRICT.

BY ALFRED O. WALKER, F.L.S.

With Plates X. and XI.

[Read 8th March, 1889.]

THE collections made this year (1888) of the Podophthal-
mata, Cumacea, Isopoda, and Amphipoda, are undoubtedly
the most interesting since the foundation of the Liverpool
Marine Biology Committee. Five species of the first,
three of the second, four of the third, and fifteen of the
fourth of these orders are new to our fauna, while probably
one Isopod and four Amphipoda are new to the British
lists, two of these latter being new to science. The
collections that have been examined were:—

- I. From Puffin Island, collected at the following dates.
 - a. March 24th, by Prof. Herdman and three others,
chiefly by dredging and with the weighted tow-net, in
the Turbot Hole.
 - b. July 24th, by Prof. Herdman, Mr. Hurst, and
Mr. Dutton of Chester.
 - c. August 15th, by Mr. Hurst and Mr. Clubb, off
the N.E. end of the island.
 - d. September 8th and 9th, by Professor Herdman,
Mr. Hurst, and the Reporter, at extreme low water,
chiefly on the Spit at the south end of the island.
- II. May 19th to 21st, in the "Hyæna," during a trip to
the Isle of Man, when the electric light (E.L.) was

* For First Report, see "Fauna of Liverpool Bay," vol. i., pp. 212—226,
1886; for the Second Report, see "Proc. Biol. Soc., L'pool," vol. ii., pp.
171—181, 1888.

used, as mentioned in Professor Herdman's Report for 1888 on the Puffin Island Biological Station, with excellent results.

- III. April to July, at Colwyn Bay, shore-hunting, dredging, &c. by the Reporter.
- IV. September 20th, at Bull Bay, Anglesey, by Mr. R. Newstead, Curator of the Grosvenor Museum, Chester.

The following species are either recorded for the first time in the fauna or in the locality indicated, or are mentioned on account of some point of interest in connexion with them.

BRACHYURA.

Xantho rivulosa, Risso.

X. tuberculata, Couch.

II. Three specimens, dredged between Calf of Man and Port Erin. They belonged to the *tuberculata* form, which was considered by Couch to be distinct, and is described and figured as such in Bell's "British Stalk-eyed Crustacea." It has since been shown to be a mere variety.

Portunus puber, Linn.

Bull Bay (IV.), in the lobster-pots, where it is said to be common. The specimens were of large size.

ANOMURA.

**Eupagurus pubescens*, Kröyer.

II. This was taken abundantly in the dredge west of the Calf of Man, but all young specimens.

**Anapagurus hyndmanni*, Thompson.

II. Scarce.

**Galathea dispersa*, Sp. Bate.

II. Thanks to the admirable monograph of the Galatheidæ by M. Jules Bonnier ("Bull. Scient. de la France

* Indicates a species not previously recorded in "Fauna of Liverpool Bay."

et de la Belgique," 1888), which the author has been kind enough to send me, I was able to identify all the specimens dredged off the Isle of Man as belonging to this species. It is best distinguished by the strong tooth on the inner side of the merus joint of the third maxillipedes being connected with the distal extremity of the joint by a ridge on which are two to four smaller teeth.

**Munida bamffia*, Pennant.

II. One specimen. Notwithstanding the high authority of Mr. G. O. Sars, who considers *M. rugosa*, Fabr., as distinct from *M. rondeletii*, Bell,† I agree with M. Bonnier and others in holding them to be the same, and therefore referable to the older name of Pennant. Mr. R. Pocock, of the British Museum, and I examined a large number of individuals at that institution, and found them to vary so much in the characters relied on by Sars that it was impossible to separate the two forms.

MACRURA.

**Caridion gordonii*, Sp. Bate.

II. One female, with ova, between Calf of Man and Port Erin.

Pandalus brevirostris, Rathke.

II. Several between Calf of Man and Port Erin.

CUMACEA.

**Cuma scorpioides*, Montagu.

II., E.L. Two young males. Taken by electric light (E.L.) at Ramsey. Recognizable by the lateral carina extending longitudinally from the rostrum across the carapace and free thoracic segments (see Norman, "Brit. Assoc. Report," 1868, p. 273).

† "Oversigt af Norges Crust.," p. 6, pl. i., fig. 5.

**Iphinoe trispinosa*, Goodsir.

II., E.L. Three males. Port Erin. These were the variety without the serrated dorsal crest.

**Pseudocuma cercaria*, Van Beneden.

II., E.L. A very large number, all males, at Port Erin. This is certainly the species described under the above name by G. O. Sars,† but it is difficult to believe that Van Beneden's‡ figures and description (which Sars remarks are "faulty in the extreme") can refer to the same. Our experience in the "Hyæna" confirms Norman's statement, that this is "the most numerically abundant species of Cumacean in the British seas."§

ISOPODA.

**Anceus maxillaris*, Mont.

III. A specimen of the *Praniza* form of this (?) species, taken in a rock pool at Penmaenrhos, attached to a young *Cottus* behind the second dorsal fin. Colour, brilliant blue-green.

Janira maculosa, Mont.

II. A number of specimens on a mass of *Alcyonium digitatum*, dredged between the N.W. Lightship and Isle of Man, on the outward trip of the "Hyæna," 19th May, 1888.

**Munna fabricii*, Krøyer (Pl. XI., figs. 16 to 18).

I. A single specimen, without the long ambulatory legs and long outer antennæ. The telson agrees with Krøyer's

† Middelhavet's Cumaceer, Arch. fur Math. og Naturvidenskab, 1878, p. 114, pls. 40—42.

‡ "Recherches sur la Faune litorale de la Belgique." Crust., p. 85, pl. xiv. *Leucon cercaria*.

§ "Ann. and Mag. Nat. Hist." 5th series, vol. xix., p. 102.

figure in general form, but wants the teeth at the edge both near the proximal and distal extremity (see G. O. Sars, "Oversigt af Norges Crust.," p. 65). The first pair of feet also agree with Kröyer's figure.

**Dynamene rubra*, Mont. (Female.)

D. viridis, Leach. (Female.)

Næsa bidentata, Leach. (Male.)

D. varians, Stebbing.

I. and IV. On Algæ. Stebbing† and Hesse‡ have pointed out that the above are all one species. The colour appears to depend upon that of the weed on which they feed. The specimens from Bull Bay were green when taken, but turned red in spirit.

**Dynamene montagui*, Leach.

IV. With the last species, of which it may possibly be the adult female.

Ligia oceanica, Linn.

I. A specimen was found by Dr. Herdman in a rock pool on the N.E. end of Puffin Island, on 14th February, 1889. As this species is not usually found in the water (its habits being much the same as those of the strictly terrestrial Oniscidæ, except that it lives near the sea), it is probable that the specimen in question was a female that had gone into the sea to deposit its ova, as appears to be the case with the otherwise practically terrestrial Amphipod *Orchestia gammarellus*. The space under the thoracic segments was quite empty, as if it had recently been filled with ova. It is an interesting fact as bearing upon the phylogeny of the terrestrial Isopoda, that the common *Porcellis scaber* if it falls into water sinks at once to the bottom, where it will crawl and live for a considerable

† "Proc. Linn. Soc.," vol. xii., 1876. Zool., p. 146, pl. vii.

‡ "Ann. des Sciences Nat." 5th series, vol. xvii., p. 1.

time. This, coupled with the amphibious habits of *Ligia*, seems to point to an aquatic origin.

AMPHIPODA.

Hyperia medusarum, Müller.

Two large females with ova from lobster-pots. IV. Mr. Newstead says the eyes were brilliantly luminous.

Hyale nilsonii, Rathke.

A single female. I.a.

Orchestia gammarellus, Pallas.

A male under a stone on grass close under Burton Rock, on the Dee, on 7th February. Another near Port Erin, "fully 500 yards from the shore" (T. L. Denson in lit.).

**Lysianax ceratinus*, † n. sp. (Pl. X., figs. 1 to 8).

Lateral lobes of the head prominent, subangular. First four epimera deeper than the corresponding dorsal segments, the first equal in width at the widest part to the two next together. *Third pleon segment having the hinder angle rounded, but approaching to subangular.*

EYES large, oval, dark, occupying the greater part of the head.

UPPER ANTENNÆ: First joint as long as the lateral lobe of head, upper and lower margins produced to a point, the lower rather the longer; second joint rather more than half as long as the first; third joint about half as long as the second. Flagellum eight-jointed, the last joint minute. Accessory appendage four-jointed, the first

* It is possible that this may be the female of *L. longicornis*, Lucas, though it differs from the male of this species as described and figured by this author in not having the telson terminated by a rounded point, in the form and armature of the last uropods, and in the shape of the lateral cephalic lobe. From the same (?) species as figured by Bate and Westwood it differs in having no spines on the telson and no hairs on the last uropods.

† κεράτινος, horny.

reaching to the middle of the second joint of the flagellum, the last joint minute.

LOWER ANTENNÆ: First joint shorter and thicker than the second, which is equal to the third. Flagellum ten to eleven-jointed, the first joint nearly equal to the three succeeding united.

FIRST GNATHOPODS: First joint as long as the three following, the second and third being very short, wrist and hand about equal. First joint with a few hairs on the front margin, the second densely hairy on the hind margin, the third with short fur on the hind margin and long hairs at the distal end. The hand tapers and forms with the immoveable finger an elongated cone, furnished on the hinder (i.e. lower) margin *with a row of five or six short spines* and a few setæ. On account of the roundness of this joint the spines cannot always be seen. The finger has a hinged spine articulated to the upper side near the point beyond which it extends, giving it the appearance of being split.

SECOND GNATHOPOD: First joint the longest, second equal to the fourth (wrist), which is longer and deeper than the hand. This limb is of a type common in this family, and is well represented by that of *Orchomene serratus*, in Boeck's "Amphipoda," pl. v., fig. 2.k.

FIRST PERÆOPODS: Hinder margins of third and fourth joints equal, and furnished with long hairs. Front margin of third produced to one-third of the length of the fourth. Fifth joint half as long again as the fourth, with nine or ten strong spines on the hinder margin and three more slender on the front.

LAST PERÆOPODS: First joint dilated; a row of twelve or thirteen spines on the anterior margin gradually increasing in size downwards and terminating at the apex, which is produced downwards, in a group of one large and

two smaller spines. Second joint short and terminated anteriorly by a similar group of spines. Third joint produced downward for about one-third the length of the fourth, the lobe thus formed being crowned with a double spine and the hind margin having three strong spines. The remaining joints are somewhat variable in length and armature in different specimens.

All the peræopods have the third joint produced.

UROPODS: First pair projecting beyond the others; peduncle longer than rami, both spinous. Second pair projecting as far as the third, spinous as the first. Third pair with the peduncle longer than the rami, widening suddenly at the proximal and tapering slightly towards the distal end; it has three small spines on the upper margin. The rami are round, the outer slightly the longer, the inner with two minute spines. There are no hairs (setæ) of any kind on the uropods.

TELSON concave, entire, quadrate, with the side curved; hinder margin straight.

LENGTH 10 mm.

The integument is hard, and horny both in colour and texture—hence the specific name, from *κεράτινος*, horny.

I. b. A single female specimen of the same species as those recorded in Report I. as *L. costæ*, and corrected in Report II. to *L. longicornis*, Lucas. Neither of these appears to be correct, as far as it is possible to judge from females only, no male having yet been taken in our district. Stebbing ("Challenger" Report) shows that *Lysianassa* was already preoccupied in the Mollusca and substitutes *Lysianax*. I include the present species in the genus in spite of the uropoda not being ciliated, which I submit is scarcely a fit generic character. The squamiform entire telson, and the conical propodos of the first gnathopod with apparently immoveable dactylos, are such marked

characteristics as to be sufficient reason for referring it to *Lysianax*.

**Lysianax audouinianus*, Sp. Bate (Pl. X., figs. 9 and 10).

II. Two young specimens on *Halichondria*, dredged in thirty fathoms, twenty-two miles S.E. of Isle of Man. Length 3 mm. Heller† has described a form which he calls *Aristias tumidus*, (jun.), Kröyer, but which he says differs in some of the mouth organs from the adult. It also differs in having an entire telson. But Hansen‡ says that *A. tumidus* of all authors except Kröyer is not the same species as the latter's, and proposes the name of *A. neglectus* for *A. tumidus*, Auct. Boeck includes with this *Lysianassa audouiniana*, Bate, but, as Hansen points out, this species has an entire telson, while in the genus *Aristias*, Boeck, it is cleft to the base. I therefore refer both my specimens and those of Heller to *L. audouiniana*, although they should properly be placed in a new genus, as the strongly subchelate character of the first gnathopod does not agree with Boeck's definition of *Lysianassa*. In my specimens the inner rami of all the uropods are minutely toothed on *both* edges, as are also the outer rami on the inner edge. As however it requires a high power ($\frac{1}{4}$ -inch objective) to see this denticulation, it may have escaped observation.

**Hippomedon denticulatus*, Bate and Westwood.

One young specimen, Port Erin, five fathoms. II., E.L. Hansen§ points out differences between this species and *H. holbolli*, Kr., with which Boeck unites it. In the former the integument is smooth, while in the latter it is reticulate and granulate. The hinder angle of the third pleon

† "Crust. &c., Oster. Ungar. Nordpol. Expn.," p. 6, pl. iv., figs. 1-8.

‡ "Videnskabliger Meddelelser Nat. Forening i Kjobenhavn," 1887.

§ "Vidensk. Med. Nat. Forening i Kjob.," 1887, p. 63.

segment in the former is much more produced and curved than in the latter. Bate and Westwood's figure differs from both as figured by Hansen in the shape of the telson; also in the second uropods, which they figure as spinous, but describe as "simple." In my young specimen these have a single spine about one-third of the length of the ramus from the peduncle, and a similar spine on the inner (?) ramus of the third uropods about the middle.

**Orchomene goësi*, Boeck.

I. d. A single specimen. New to the British lists. Distinguishable by the short and wide hand and wrist of the first gnathopod, and by the very broad peduncle and short rami of the third uropods.

**Tryphosa hōringii*, Boeck.

I. a. Three specimens. New to British lists.

Tryphosa ciliata, Sars.

I. a. One specimen. I question whether this is distinct from *T. nana*, Kr.

**Euonyx chelutus*, Norman.

Euonyx chelutus, Norman, "Brit. Assoc. Rep.," 1866.

Opis leptochela, Bate and Westwood, "Brit. Sess. Crust.," vol. ii., p. 501.

One specimen off the Lighthouse. I. Norman, in his report on the Shetland dredging, *l.c.*, describes this species. As the first gnathopods have the hand long and slender instead of very large, according to the character of *Opis*, as defined by Krøyer, it should not in any case have been referred to that genus. Norman says it is parasitic on *Echinus esculentus*. In my specimen the second gnathopod is not so hairy as shown in Bate and Westwood's figure, and the tooth or hump on the dorsal surface of the fourth pleon segment is much more marked.

Bathyporeia pilosa, Lindström.

II., E.L. In immense numbers, of both sexes.

Urothoe marinus, Bate.

U. elegans, Bate.

One specimen. Male. I.

**Amphilochus manudens*, Bate.

One specimen. I. a.

Metopa alderi, Bate.

Several specimens, all very small. I. and II.

Iphimedia obesa, Rathke.

One specimen. Length 4 mm. I. a. This specimen was nearer *I. eblana*, Bate, which however Stebbing considers is only a (? young) form of *I. obesa*.†

**Monoculodes longimanus*, Bate and Westwood.

M. longimanus, Bate and Westwood.

M. grubei, Boeck, "Brit. Sess. Crust.," vol. ii, p. 507.

Several specimens. II., E.L.

**Megaluropus agilis*, Norman.

A few specimens. II., E.L. An undescribed species, having some remarkable characters, notably the very broad third uropods, and the position of the eye in the front portion of the lateral cephalic lobe. It has long been in the rich collection of Norman, who is about to publish a description in the "Ann. and Mag. Nat. Hist."‡ He informs me that he has specimens from the east, west, and south coasts of Great Britain. The third uropods are very fragile and often missing in dead specimens.

Dexamine spinosa, Mont.

Not common on Puffin Island. I. d.

**Atylus vedlomensis*, Bate and Westwood.

Dexamine vedlomensis, Bate and Westwood.

Not common. I. d. II., E.L.

† "Challenger" Report, p. 295.

‡ "Ann. and Mag. Nat. Hist.," 6th series, vol. iii., p. 445, pl. xviii., figs. 1 to 10.

**Tritæta gibbosa*, Bate.

Atylus gibbosus, Bate and Westwood.

Not uncommon on Sponges, Ascidians, &c. I., II., III. Most easily obtained by placing freshly gathered pieces of *Halichondria panicea* in sea water, when it emerges from them.

Halirages bispinosus, Bate.

I. d., IV.

Calliopijs leviusculus, Sp. Bate.

Very abundant. I. d. All the specimens taken were freckled with red. This species varies in colour remarkably in different localities. At Colwyn Bay it is generally greenish white, while those I have seen from Penmaenmawr were olive coloured.

**Calliopijs norvegicus*, Rathke (?).

Llandudno. I. b., III., IV. It is remarkable that this species, which has not been previously recorded as British, should this year have been taken at all the above localities, at Bull Bay (IV.) abundantly. Mr. Stebbing informs me, however, that it is not uncommon at Ilfracombe. Meinert† and Zaddach‡ do not consider it distinct from the preceding. I am surprised at this statement, for the longer and more slender antennæ, the teeth on the under side of the last joints of the peduncle of the upper antennæ in the male (in place of the strong tooth at the distal extremity of the last joint in *C. leviusculus*), the smaller and weaker gnathopods with the wrist not produced into a spur, and lastly the angulated hind margin of the third pleon segment above the lower angle, make the distinction unmistakable. At the same time, I doubt whether *C. norvegicus* of Boeck (which is certainly our species)

† "Crust. Isop. Amphip. und Decap. Danie." Natur. Tidsk. 1877-8.

‡ "Die Meeres-Fauna an die Preuss. Küste."

be identical with *Amphithoe norvegicus* of Rathke. The latter has the upper antennæ only half as long as the lower, whereas I have never seen a specimen in which they were not almost exactly equal as shown by Boeck. Rathke's other characters also are scarcely sufficient to connect them.

Gammarus marinus, Leach.

I. a.

Melita obtusata, Mont.

I. a., II. A number on *Asterias rubens*, dredged between the N.W. Lightship and the Isle of Man on the outward voyage of the "Hyæna," May 19th, 1888.

Amathilla sabini, Leach.

I. a.

* *Ampelisca tenuicornis*, Lilljeborg.

A. typica, Boeck, non Bate.

(?) *A. carinatus*, Bruzelius.

I. a. II., E.L., and dredged. The confusion as regards the above species is great (see Stebbing, "Challenger" Report, p. 542). As this author remarks,† his *A. zamboangæ* from the Philippine Islands approaches closely to *A. carinatus*, Bruz. Two of the specimens from Port Erin agree so closely with the admirable drawings of *A. zamboangæ* that the two forms can hardly be regarded as other than local varieties.

Ampelisca lævigata, Lillj.

II., E.L. Many specimens, both at Ramsey and Port Erin. This appears to be the commonest species of the genus in Liverpool Bay.

Photis reinhardi, Kr.

One female, with ova. II., E.L.

† "Challenger" Report, p. 1687, note.

Nænia rimapalma, Bate.

I. a.

Amphithoe podoceroides, Rathke.

I. a. Stebbing† considers this to be the same as *A. rubricata*, Mont., though the former is green and the latter red. Here again, as in *Dynamene rubra*, Mont., and *D. viridis*, Leach, the colouring probably depends on that of the weed in which the animals are found. Montagu's name being the older should have the precedence, as Stebbing points out.

**Podocerus capillatus*, Rathke (Pl. XI., figs. 14 and 15).*Janassa variegata*, Boeck.

I. c. One small specimen, 2 mm. long, taken in the tow-net by Mr. I. C. Thompson. There is much confusion about this species, which appears to me to have arisen chiefly from the figure in Bate and Westwood,‡ and from their statement that it is possibly only a variety of *P. variegatus*, Leach. The figure of the entire animal as shown by these authors may or may not be the last named species, but the separate drawings of the lower antennæ and second gnathopod unquestionably indicate *P. capillatus* of Rathke. Leach's characters are so unsatisfactory that it seems hopeless to determine whether his *P. variegatus*, *Jassa pulchella*, and *J. pelagica*, are one and the same species (*P. falcatus*, Mont.) or not. But the upper antennæ without a secondary appendage, the thickness and dense hairiness of the lower antennæ, with the flagellum consisting of one long and two minute joints unprovided with the hooks which occur in the same member in *P. falcatus* (and *P. variegatus*, as figured by Bate and Westwood), together with the form of the second gnathopod, all mark *P. capillatus* as very distinct from

† "Challenger" Report, pp. 204 and 594.

‡ Brit. Sess. Crust., p. 442.

P. falcatus at any age. Indeed the absence of a secondary appendage would seem to justify Bruzelius in placing it in a separate genus, *Jassa* of Leach, though it is not easy from Leach's description (in the Trans. Linn. Soc., vol. xi., p. 361) to see in what material point this genus differs from his *Podocerus*.

**Podocerus isopus*, n. sp. (Pl. XI., figs. 11 to 13).

Lateral lobe of the head a sharp right angle. Eyes round, centre dark, surrounded by a ring of clear facets.

ANTENNÆ subequal, the upper rather the longer, sparsely hairy; the peduncle of the lower and the flagellum of the upper being the longer. The *upper antennæ* have the second and third joints equal, about five tufts of two hairs on the under side of each. The secondary appendage, which consists of one long and one minute joint terminated by setæ, is rather more than half as long as the first joint of the flagellum. This has five joints, the second and last being the shortest; the last is also much thinner than the penultimate. The *lower antennæ* have the second joint of the peduncle about three-fourths the length of the third; the flagellum is five-jointed, the first joint nearly as long as the second and third together; the fourth joint is terminated by two, and the fifth (which is small) by one curved spine.

FIRST GNATHOPODS: Wrist shorter than the hand, rounded posteriorly. Hand ovate, palm undefined, with many hairs, two strong spines in the middle and one nearer the wrist. Finger long, reaching the lower spine, and serrated on its distal half, but not as far as the point.

SECOND GNATHOPODS: Like the first gnathopods, except that the margin of the palm in the distal half is somewhat sinuate. In the male (?) the hand is about one-third larger than in the first pair; in the female the two limbs differ but little in size.

UROPODS: The three pair extend about equally backwards; in the first the peduncle is slightly longer, in the second shorter, and in the third much longer than the rami. The peduncle of the third has three short spines on its upper margin, and five or six at the distal end. The outer ramus is longer than the inner, straight, smooth and tapering, terminated by a minute nail; the inner is curved, minutely denticulate on the concave side, with a comb-like process of five or six somewhat larger teeth overlapping the nail.

TELSON convex, triangular, with curved sides and rounded apex; a pair of upright spines on each side of a median line, somewhat nearer the apex than the base.

The specific name is derived from *ἴσος* equal, *πούς* foot, referring to the equality between the first and second gnathopods, which is unusual in the genus *Podocerus*. The animal is variable in colour and prettily mottled.

I. a., III. It is with great hesitation that I describe as new a small species taken as above. One at least of the specimens was a female, with ova, which agrees with Boeck's description of the female of *P. anguipes*, Kr., except in size—Boeck giving 10 mm. as the length, while this specimen was not more than 3 mm. If I am right in believing some of my specimens to be males, then it is certainly not *P. anguipes*, for the second gnathopod (which is almost the same shape as, and but little larger than the first) in these differs from that in the female only in being slightly larger. It is possible that Boeck has been mistaken in referring the small males he mentions as resembling the females to *P. anguipes*. If this be so, the present species may be considered as new to science, and I propose to name it provisionally *Podocerus isopus*. Mr. Stobbing informs me he has received similar forms from Mr. D. Robertson, taken in the Clyde district, and con-

sidered them to be females of *P. anguipes*, Kr., in spite of their small size. No male of this species, which has a very characteristic second gnathopod, is known to have been taken on the British coasts, which furnishes another reason for believing our species to be distinct.

**Corophium crassicorne*, Bruzelius.

I. d. Two or three specimens of what I take to be the young form of the above. The upper antennæ have three spines on the first joint; the lower have one double spine on the first joint, two double and one single on the second, and one single on the third joint of the peduncle. Hoek,† who describes and figures this form, also considers it probably the young of the above species, though some females had eggs. In other respects my specimens agree closely with Hoek's figures of the adult *C. crassicorne*. Norman has taken this form at Roundstone, in Ireland.

CAPRELLIDÆ.

Proto ventricosa, Müller.

P. pedata, Mont.

P. goodsiri, Bate. (Old male.)

Three or four specimens. I. d. Stebbing‡ holds that *P. goodsiri* is merely a form of *P. ventricosa*, in which he has been confirmed by Mayer.§

Ægina phasma, Mont.

Protella phasma, Bate and Westwood.

Several fully developed specimens. I. d.

**Caprella acanthifera*, Leach.

Three or four specimens. I. d., IV. None of the specimens had fully developed tubercles or spines, and they

† "Tijdschrift Nederland. Dierkund. Vereen.," Deel. iv., p. 118, pl. viii., figs. 9 and 10.

‡ "Ann. and Mag. Nat. Hist." Series 4, vol. xvii., p. 78.

§ "Fauna, &c. des Golfes v. Neapel.," part vi., 1882. Caprelliden.

were only recognizable by the peculiar skull-shaped head and the sparse hairiness of the lower antennæ. A female, with eggs, from Bull Bay, had a large tubercle on the first segment. Mayer (*l.c.*) shows that perfectly smooth forms are not uncommon, but that it is on this segment that a spine or tubercle is most often developed.

In conclusion, I have to tender my hearty thanks to the Rev. T. R. R. Stebbing and the Rev. Canon Norman, for their kind assistance, and especially to the former, for the gift of his magnificent work on the "Challenger" Amphipoda. The bibliography alone of this work is a perfect monument of patient work, and, consisting as it does of a resumé of all that has been written on the entire subject, accompanied by the author's comments, is a complete library in itself. It is no exaggeration to say that it will be indispensable to every student of the Amphipoda.

DESCRIPTION OF PLATES.

PLATE X.

Figs. 1 to 8, *Lysianax ceratinus*, n. sp.

Fig. 1. Antennæ.

Fig. 2. Mandible and palp.

Fig. 3. Maxillipede.

Fig. 4. First gnathopod.

Fig. 5. Third segment of pleon.

Fig. 6. First and second joints of last peræopod ;
6a, spines on the same.

Fig. 7. Telson.

Fig. 8. Third uropod.

Figs. 9 and 10. *Lysianax* (?) *audouinianus*, Sp. Bate.

Fig. 9. First gnathopod.

Fig. 10. Second gnathopod.

PLATE XI.

Figs. 11 to 13, *Podocerus isopus*, n. sp.

Fig. 11. Head and antennæ.

Fig. 12. First (a) and second (b) gnathopods of female.

Fig. 13. Third uropod.

Figs. 14 and 15, *Podocerus capillatus*, Rathke.

Fig. 14. Antennæ.

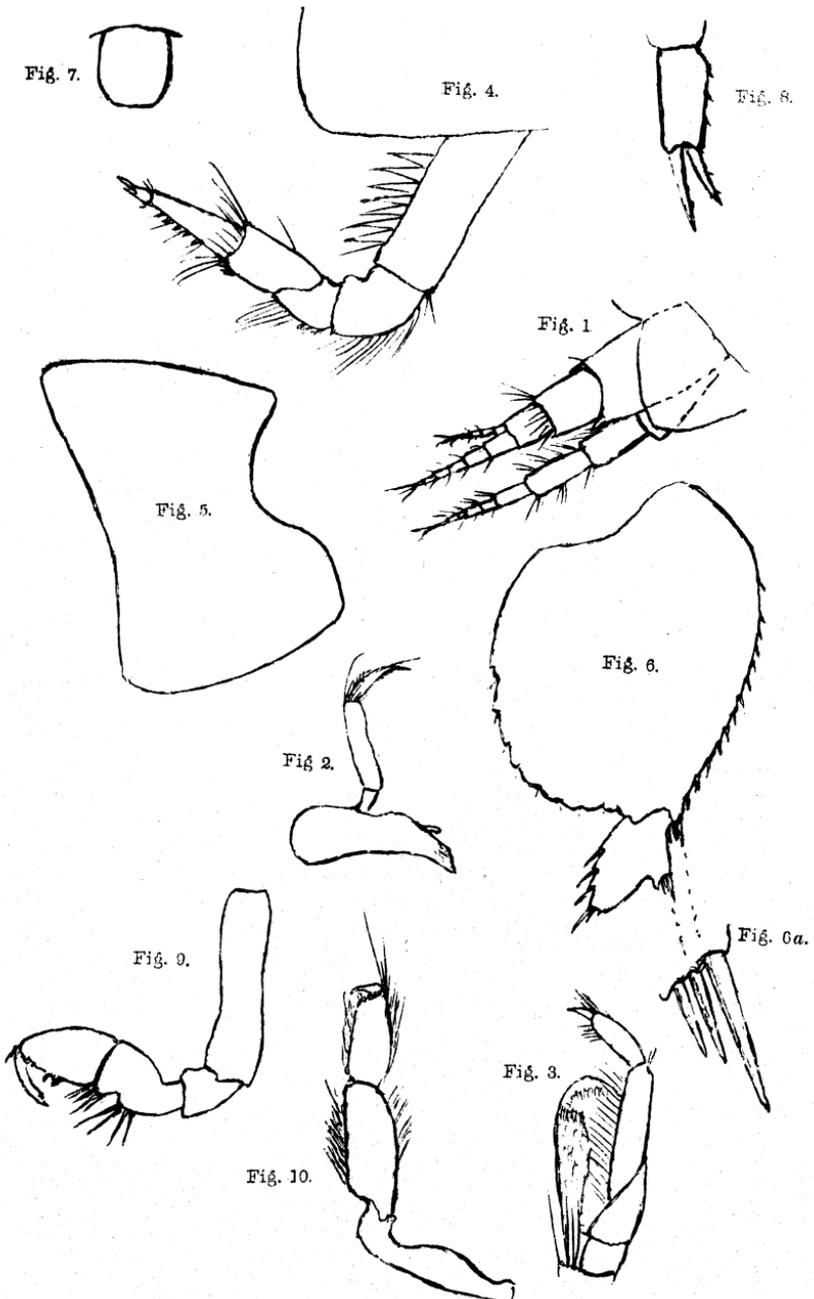
Fig. 15. Second gnathopod.

Figs. 16 to 18, *Munna fabricii*, Kröyer.

Fig. 16. First foot.

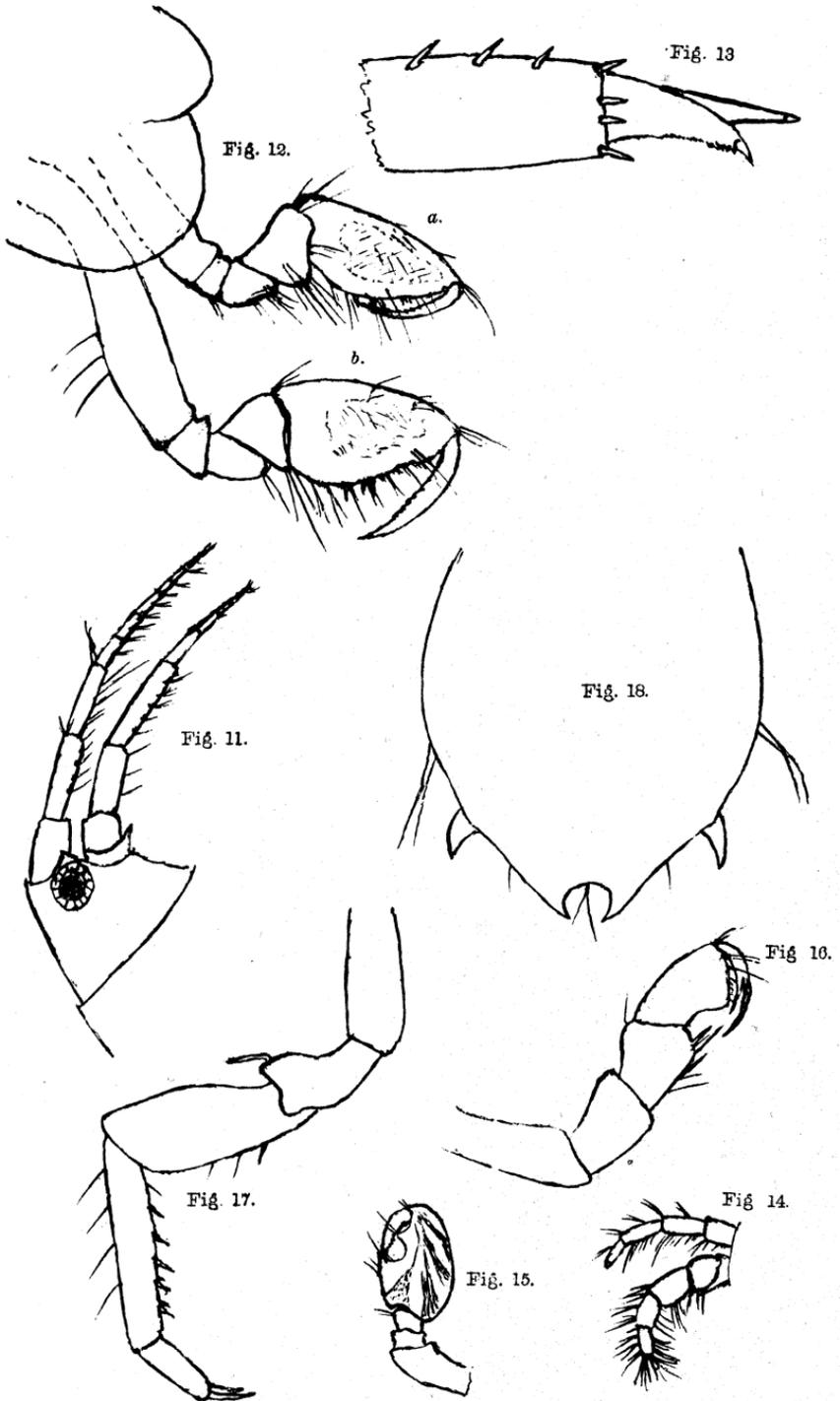
Fig. 17. Second foot.

Fig. 18. Telson.



A. O. Walker, del.

LYSIANAX CERATINUS, n. sp. Figs. 1 to 8.
LYSIANAX (?) ANDOUINTIANUS (Sp. Bets.) Figs. 9 and 10.



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PODOCERUS ISOPUS, n. sp. Figs. 11 to 13
PODOCERUS CAPILLATUS (Rathke) Figs. 14 and 15.