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ON AUSTRALIAN AMPHIPODA.

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[Plates VII.—XII.]

The Edriophthalsms of Australia, as of the Southern Hemisphere generally, have suffered considerable neglect at the hands of naturalists. Milne-Edwards in his "Histoire naturelle des Crustacés," (1837), describes but one species of Australian Amphipod; Prof. Dana in his great work on the Crustacea of the United States Exploring Expedition describes six species from the Australian coast; among the species described by Stimpson in papers published in the Proceedings of the Academy of Natural Sciences of Philadelphia (1855) are two from Australia; finally Mr. C. Spence Bate in his valuable "Catalogue of the Amphipoda in the Collection of the British Museum" (1862), adds four new species to the list of Australian forms.

The present paper contains descriptions of thirty-seven new species, comprising, as might be expected, several interesting new generic forms.

It would be premature until a more complete series has been obtained to offer any generalisations on the relations borne by the Australian region—as regards this group of Crustacea—to the other zoological provinces. I am confident however, from what I have already observed that the edriophthalmous fauna of Australia will prove on further investigation to be an exceptionally rich one, and will be found to possess a well-marked distinctive facies.

Of the specimens from which the descriptions and drawings were made, some, including all the Tasmanian species, are in the collection of the Hon. William Macleay, of Elizabeth Bay, Sydney, by whom they were kindly lent me for examination; others were obtained during the dredgings carried on in Port Jackson during the last few months under the auspices of the Trustees of the Australian Museum, and were lent me for investigation by Mr. E. P. Ramsay, the Curator of that Institution to whom I here take the opportunity of expressing my thanks; the remainder were collected by myself with the valuable assistance of Mr. George Masters, Curator of the Macleay Museum, Sydney.

GROUP *NORMALIA*.

FAM. ORCHESTIDÆ.

Genus *TALITRUS*, Latr.

Talitrus sylvaticus, *sp. nov.* (Plate VII., fig. 1.)

Coxæ of third pereopoda much broader than the others. Eyes round. Superior antennæ nearly equal in length to the cephalon and first segment of the pereion; first segment of the peduncle compressed; second segment the longest; third very short; flagellum rather shorter than the peduncle. Inferior antennæ

equal in length to the cephalon and pereion; peduncle with three articuli visible, the third nearly twice as long as the second; flagellum longer than peduncle, finely fringed with cilia. Mandibles powerful, very deep; furnished with a large and prominent molar eminence crossed by about a dozen dentary ridges; cutting edge armed with four teeth, that nearest the molar surface bifurcated, the next two simple, prominent, the fourth inconspicuous; between the first of these teeth and the molar eminence are several pointed curved ciliated spines. Maxillipedes resembling somewhat those of *T. locusta*; the plate of the first articulation armed with three short blunt teeth, that of the second articulation ending in a single tooth; carpus and propodos with one or two setæ. Anterior gnathopoda pediform, the propodos tapering distally. Posterior gnathopoda imperfectly subcheliform; the carpus and propodos long and narrow (longer in the female than in the male) the short dactylos situated at a little distance from the extremity of the propodos.* Anterior pereiopoda subequal. Pereiopoda of the third pair much shorter than the fourth and fifth; bases of fifth pair broad, finely serrated along the posterior margin. Last pair of pleopoda short. Telson consisting of a disc-like, dorsally-concave plate, bordered with hairs, and cleft in the middle line posteriorly.

Colour usually dark slate; occasionally dull yellow.

Length five and a half lines.

The habitat of this species of *Talitrus* is peculiar. It is abundant on moist ground in wood and scrubs of New South Wales; I have received specimens, obtained by Mr. George Masters, from Rootyhill (a point about 30 miles from the coast) where it is very common; how much further inland its range may extend I have no exact data to enable me to determine; probably

*These appendages instead of being habitually folded up under the pereion, as in *T. locusta* and other species of the genus, are in constant and active use as organs ancillary to the process of mastication.

it is confined to a maritime belt of moderate breadth, as I am informed that it is not met with in the far interior. I have never observed it on the sea-shore.

Genus TALORCHESTIA, Dana.

Talorchestia diemenensis, *sp. nov.* (Pl. VII., fig. 6.)

Superior antennæ equalling the cephalon in length. Inferior antennæ equal in length to the cephalon and first three segments of the pereion, the third joint short, the fifth the longest; flagellum subequal with the peduncle, fringed with short hairs. Anterior gnathopoda in the male with the carpus broad distally, the propodos quadrangular, twice as long as broad, the palmar border transverse, slightly sinuous, the dactylos short; in the female with both carpus and propodos narrower than in the male, the palmar border with a deep mesial notch, the dactylos well-developed. Posterior gnathopoda in the male large, the propodos compressed, irregularly cordiform with the palm oblique, defined by a rounded tooth; in the female small, imperfectly subcheliform, the propodos narrow, nearly thrice as long as broad, parallel-sided, with the palm oblique, the dactylos rudimentary. Pereiopoda setiferous; third pair much shorter than fourth and fifth. Telson triangular, blunt.

Length three lines.

Hab. Tasmania, (M.-M.)

Talorchestia quadrimana, Pl. VII., fig. 3.

Orchestia quadrimana, Dana, *Proc. Amer. Acad. Sci. Bost.* ii., 204; U. S. *Exploring Exped.* p. 879, pl. 59. f. 7; *Spence Bate, Cat. Amph.* p. 31, pl. v., fig. 3.

From the locality whence Dana obtained his specimens, and from his description I am inclined to place the common *Talorchestia* of New South Wales under this heading, though the form of the posterior gnathopoda, as shown in Dana's figure, is totally unlike that of those organs in any of the specimens I have examined.

Male.—Coxæ deep. Eyes large, round. Inferior antennæ exceeding in length the cephalon and two first segments of the pereion; peduncle and flagellum subequal, the fifth joint of the former longer than the fourth. Superior antennæ equalling in length the third and fourth segments of the peduncle of the inferior pair. Mandibles very powerful, resembling in general form those of *Talitrus sylvaticus*, the cutting edge with several strong curved teeth, between which and the grinding tubercle are seven slender ciliated spines; the molar tubercle broad, crossed by numerous very fine, acute transverse ridges. Maxillipedes non-unguiculate, the edges of the two terminal segments and of the lateral plates armed with numerous setæ. Anterior gnathopoda subchelate, carpus and propodos subequal, armed with setæ; propodos subtriangular, palm transverse, hairy, defined by a rounded elevation, superior border with five setiferous serrations. Posterior gnathopoda with the propodos large, varying in size; usually about four times as long as that of the anterior pair, sub-quadrated, the palm transverse, excavated, armed with a few minute teeth. First pair of pereiopoda rather longer than the second; third pair much shorter than fourth and fifth; fifth the longest, its basos much broader than that of the others; three posterior pairs armed with setæ, set on lateral serrations. Posterior pleopoda with the ramus slender. Telson triangular, blunt, cleft.

Female.—Anterior gnathopoda subpediform, the propodos narrowing distally, its superior border serrated, setiferous, its lower border setiferous, entire. Posterior gnathopoda with the carpus and propodos narrow, the dactylos rudimentary, not reaching to the extremity of the propodos. Colour white, with irregular light-red spots.

Length six lines.

Hab. Sandy beaches, coast of New South Wales (Manly, Bondi, Kiama); found under masses of decaying sea-weed above the reach of ordinary tides.

Genus ORCHESTIA, Leach.

Orchestia Macleayana, *sp. nov.* (Pl. VII., fig. 2.)

Male.—Inferior antennæ as long as the cephalon and first four segments of the pereion; the peduncle stout and longer than the flagellum. Superior antennæ about one-third of the length of the inferior pair, slightly exceeding the cephalon in length; flagellum and peduncle subequal. Anterior gnathopoda with the carpus triangular, longer than the propodos; the propodos broader at its distal than at its proximal end, the palm transverse. Posterior gnathopoda with the propodos membranous, large, cordiform, thrice as long as that of anterior pair; palm oblique, undefined, waved. First pair of pereiopoda longer than second. Second pair with the meros broader than that of first pair. Three posterior pairs increasing progressively in length, the fourth pair much longer than the third and the fifth slightly longer than the fourth; basos of the fifth with a tooth on its posterior margin. Posterior pleopoda short. Telson triangular, blunt.

Female.—Posterior gnathopoda with the propodos shorter than the carpus, oval; dactylos rudimentary.

Length four and a half lines.

Hab. Sandy beaches, Port Jackson; Kiama, New South Wales; found among decaying sea-weed.

This species is very nearly allied to *O. dispar*, Dana (U. S. Exploring Exped., p. 878. pl. 59, f. 6; Spence Bate, Cat. Amph. p. 32, pl. v., fig. 5) but is distinguished from it by the form of the last pair of pereiopoda.

Genus ALLORCHESTES, Dana.

Allorchestes rupicola, *sp. nov.* (Pl. VIII., fig. 1.)

Eyes large, subreniform. Superior antennæ as long as the cephalon and two first segments of the pereion; third segment of the peduncle short; flagellum longer than peduncle. Inferior antennæ as long as the cephalon and first three segments of the

pereion; flagellum and peduncle subequal. Anterior gnathopoda of moderate size, the carpus with a projecting ciliated process on its inferior border; the propodos ovoid; palm oblique, convex, defined by a blunt tooth. Posterior gnathopoda large; the propodos more than twice as long as that of the anterior pair, ovoid, its proximal border with a deep notch, its superior border strongly convex, palm scarcely oblique, convex, armed with an obscure tooth. Pereiopoda of the two anterior pairs subequal. Three posterior pairs of pereiopoda increasing progressively in length from before backwards. Posterior pleopoda short. Telson nearly semicircular, divided.

Length four-and-a-half lines.

Hab. Shallow rock-pools a little above high-water mark, Clark Island, Port Jackson; Botany Bay.

This species is distinguished from *A. Gaimardii* (*Amphithoe Gaimardii*, Edwards, *Hist. des Crust.* iii. 37; *Allorchestes compressa*, Dana, *Proc. Amer. Acad. Sci. Bost.* ii. 205; *Allorchestes Gaimardii*, U. S. *Explor. Exped.* p. 184, pl. 60, fig. 1; Spence Bate, *Cat. Amph.* p. 41, pl. 6, fig. 9.) which seems to be its nearest ally, chiefly by the form of the anterior gnathopoda.

Allorchestes longicornis, *sp. nov.* (Pl. VII., fig. 4.)

Inferior antennæ as long as the cephalon and the whole of the pereion; third segment of peduncle short; fifth the longest; flagellum more than twice as long as the peduncle. Superior antennæ with the peduncle as long as the third and fourth segments of the peduncle of the inferior pair; first and second joints subequal; third smaller; flagellum twice as long as the peduncle. Anterior gnathopoda with the carpus sub-triangular, having a small hairy process on its ventral aspect; the propodos equal in length to the carpus, rather longer than broad, its dorsal border nearly straight, its palmar border strongly convex; palm oblique, defined by a small tooth. Posterior gnathopoda with the propodos twice as long as that of the anterior pair, heart-shaped, nearly

twice as long as broad; palm nearly longitudinal, defined by a sharp tooth. Third pair of pereopoda much shorter than the fourth and fifth.

Length about five lines.

Hab. Kiama, New South Wales, under large stones between tide marks.

Allorchestes crassicornis, *sp. nov.* (Pl. VII., fig. 5.)

Inferior antennæ as long as the cephalon and first three segments of the pereion; peduncle stout; third segment much longer than the others; flagellum very stout, rather longer than the peduncle. Superior antennæ exceeding in length the first and second segments of the peduncle of the inferior pair; the segments of the peduncle all of nearly equal length, the third slightly shorter than the other two; flagellum half as long again as the peduncle. Anterior gnathopoda with the carpus sub-triangular, having a short hair-bordered process on its ventral aspect; the propodos oblong, twice as long as broad; palm transverse, not defined. Posterior gnathopoda with the propodos two-and-a-half times as long as that of the anterior pair; palm oblique, defined, armed with a row of short spines. Third pair of pereopoda shorter than the others; fourth and fifth pairs subequal.

Length about five lines.

Hab. Kiama, New South Wales, between tide-marks.

This species is well characterised by the unusual stoutness of the inferior antennæ.

FAM. GAMMARIDÆ.

SUB-FAM. STEGOCEPHALIDÆ,

Genus STEGOCEPHALUS, Kröyer.

Stegocephalus latus, *sp. nov.* (Pl. VIII., fig. 2.)

Cephalon short, about half as long as first segment of pereion. Pereion dilated. Pleon slightly compressed. Superior antennæ

as long as the cephalon and first segment of the pereion; first joint of peduncle compressed; third joint longer than second; flagellum as long as third joint of peduncle, composed of few (seven or eight) articuli; appendage very short. Inferior antennæ nearly as long as the superior; flagellum very short, of six articuli. Gnathopoda sub-pediform, similar; anterior pair with the basos much shorter than that of the posterior pair; both hairy, with the carpus and propodos of equal length, the former sub-triangular, the latter narrow. Posterior pereiopoda with the meros produced and pointed at its postero-distal angle, and the carpus rather short, with two teeth at its distal extremity. Three posterior pairs of pleopoda stout; the rami of all three equal, short. Telson small, squamiform, slightly cleft.

Length about five lines.

Hab. Tasmania (M.-M.)

This species—of which the Hon. William Macleay has two specimens in his collection (obtained, I believe, by Mr. W. F. Petterd in Tasmania, probably in shallow water) belongs without doubt to the same genus as the rare Arctic form *Stegocephalus ampulla*. It seems to differ from it mainly (1) in the greater relative length of the peduncle in both the superior and inferior antennæ, (2) in the subchelate form of the anterior gnathopoda, (3) in the shortness of the rami of the three posterior pairs of pleopoda.

Genus *AMARYLLIS*, (*novum*).

Superior antennæ with a well-developed appendage. Mandibles with a palp. Maxillipedes with well-developed squamiform plates. Anterior gnathopoda sub-pediform. Posterior gnathopoda imperfectly subchelate. Rami of the fourth and fifth pleopoda styliform; those of sixth pair broad-lanceolate. Telson squamiform, cleft.

Amaryllis macrophthalmus, *sp. nov.* (Pl. VIII., fig. 3.)

Eyes vertically elongated, sub-crescentic. Superior antennæ equal in length to the cephalon and first five segments of the

pereion; first joint of the peduncle as long as the cephalon; second and third joints short; flagellum longer than peduncle, of about thirty segments; appendage of seven segments. Inferior antennæ with the peduncle nearly equal in length to that of superior pair; flagellum longer than peduncle. Mandibles with a three-jointed palp; cutting edge produced at each end; a pointed tubercle on the outer border in front of the insertion of the palp; squamiform plate bordered with short spines. First pair of maxillæ having the two internal plates armed with a number of compressed chitinous teeth, each furnished at its extremity with a series of denticulations. Palp of maxillipedes non-unguiculate. First pair of gnathopoda slender; the carpus and propodos narrow, the latter tapering towards its distal end. Second pair rather stouter; carpus cylindrical; propodos long, narrow, its lower border convex its upper straight; palm transverse, dactylos short. Anterior pereiopoda subequal. Meros, carpus and propodos of posterior pereiopoda serrated. Rami of fourth and fifth pairs of pleopoda styliform, slightly curved at the extremity, the inner ramus of the fifth pair rather longer and broader than the outer. Sixth pair of pleopoda a little shorter than fifth; the rami lanceolate, with smooth borders and slightly curved at the tip. Telson squamiform, deeply cleft.

Length nine-and-a-half lines.

Hab. Tasmania (M.-M.)

Amaryllis brevicornis, *sp. nov.*

This species is nearly allied to the preceding, being distinguished from it mainly by the greater shortness of the antennæ, which are not longer than the cephalon and first three segments of the pereion; the flagellum of the superior pair containing only eighteen articuli, and the appendage five.

Length four lines.

Hab. Port Jackson. Common among algæ and polyzoa in the sub-littoral zone.

Genus *NEOBULE*, (*novum*).

Superior antennæ simple. Mandibles without an appendage. Maxillipedes with a squamiform process on the basos only. Gnathopoda subchelate; second pair the larger; coxæ of anterior pair well-developed. Fourth pair of coxæ wide, excavated behind to receive the anterior part of the fifth pair. Posterior pleopoda biramous. Telson squamiform.

Neobule algicola, *sp. unic.* (Pl. VIII., fig. 4.)

Eyes round. Superior antennæ as long as the cephalon and first two segments of the pereion; first segment of the peduncle longer and stouter than the others; third scarcely distinguishable from the articuli of the flagellum; flagellum rather longer than peduncle. Inferior antennæ equal in length to the superior pair; peduncle and flagellum subequal. Anterior gnathopoda with the carpus sub-triangular; the propodos longer than the carpus, oblong; the palm transverse, concave. Posterior gnathopoda with the propodos similar in shape to that of the anterior pair, but larger. Third pair of pereiopoda shorter than the fourth and fifth; fifth pair longer than the fourth, its basos broader than that of the preceding pairs. Rami of posterior pleopoda extremely short. Telson small, entire.

Length about three lines.

Hab. Kiama, New South Wales; among sea-weed between tide-marks.

SUB-FAM. *LYSIANASSIDES*.Genus *LYSIANASSA*, Edwards.*Lysianassa nitens*, *sp. nov.* (Pl. VIII., fig. 5.)

Superior antennæ short, equalling in length the cephalon and the first segment of the pereion; flagellum about half as long as the peduncle, of ten articuli; appendage of six articuli. Inferior

antennæ subequal with superior pair; peduncle stout; flagellum rather longer than the peduncle. Anterior gnathopoda stout, pediform. Posterior gnathopoda much more slender than the anterior pair; propodos nearly twice as long as broad; palm transverse, excavated; dactylos short. Pereiopoda subequal, short and rather stout. Rami of posterior pleopoda lanceolate, both bordered with hairs on one margin. Telson simple. Colour pearly white.

Length three lines.

Hab. Port Jackson. Common among sea-weed, etc., in the sub-littoral zone.

Lysianassa affinis, sp. nov.

Nearly allied to the preceding; distinguished from it by the length of the inferior antennæ which are longer than the body.

Hab. Port Jackson.

Genus GLYCERA, (*novum*).

Superior antennæ slender, rather long, provided with an appendage. Mandibles with a palp, the incisive edge not toothed; no accessory plate; anterior margin with a prominent tubercle. Maxillipedes with large squamiform processes on the basal joints. Four anterior pairs of coxæ deeper than their respective segments; the fourth pair slightly produced inferiorly and posteriorly. Gnathopoda filiform, slender; anterior pair smaller than the posterior, imperfectly subchelate; posterior pair subchelate. Posterior pleopoda biramous; the rami broad-lanceolate. Telson double.

The length of the superior antennæ would almost seem to exclude this remarkable form from the *Lysianassides*; the rest of the structure however, appears to shew that its nearest affinities are with the present group.

Glycera tenuicornis, sp. unic. (Pl. VIII., fig. 6.)

Eyes long-oval, nearly meeting above. Superior antennæ as long as the cephalon and first three segments of the pereion, first

joint of peduncle very stout, longer than the others, second and third joints very short; flagellum longer than peduncle, slender; appendage nine-jointed. Inferior antennæ longer than the superior pair; peduncle subequal with that of the latter; flagellum thrice as long as the peduncle. Anterior gnathopoda long, filiform; basos narrow, compressed; ischium meros and carpus all sub-cylindrical and slender; propodos about one third of the length of the carpus, irregularly ovoid, narrowed distally, its ventral border armed with curved setæ. Posterior gnathopoda elongated, slender, but stouter than the anterior pair; propodos nearly twice as long as carpus, sub-quadrate, nearly as broad as long, the palm concave, the ventral and distal angle prominent, acute. Third pair of pereopoda much shorter than the rest; the basos circular, serrated posteriorly. Basos of following pairs oval, non-serrated; meros, carpus and propodos hairy. Fourth and fifth pairs of pleopods with the rami slender, styliform; ramⁱ of the last pair broad-lanceolate, acute. Lateral halves of the telson broad-lanceolate, pointed.

Length four lines.

Hab. Howick Group, N.-E. Australia (M.-M.)

SUB-FAM. AMPELISCADES.

Genus AMPELISCA, Kröyer.

Ampelisca australis, *sp. nov.* (Pl. VIII., fig. 6.)

Superior antennæ as long as the cephalon and the first segment of the pereion; first joint of peduncle short, stout; second longer and narrower; third not distinguishable from the articuli of the flagellum; flagellum slender, composed of elongated articuli. Inferior antennæ about twice as long as the superior; third segment of the peduncle short, stout; fourth narrow and elongated (as long as the cephalon); fifth rather shorter than fourth; flagellum equal in length to the first two segments of the peduncle, of about ten slender articuli. Maxillipedes with the dactylos stout,

as long as the propodos; the plate of the ischium furnished along its inner margin with a series of eight short, broad, compressed spines, succeeded towards the apex by long and slender spines. Gnathopoda non-subchelate; the anterior pair with the meros, carpus and propodos of nearly equal length, narrow, furnished with long simple hairs; posterior pair similar, but shorter and slightly stouter; dactylos two-thirds of the length of the propodos. Two anterior pairs of pereopoda with the carpus very short, about one-fifth of the length of the meros; the propodos nearly twice as long as the carpus, narrower; the dactylos as long as the carpus and propodos, nearly straight. Posterior pereopoda with the dactylos very small, directed backwards; meros of the third and fourth pairs shorter than the carpus; carpus and propodos subequal, fringed with long hairs; basos of last pair narrower than that of third and fourth, its posterior edge with a blunt projection, armed with long bristles; the meros very short and broad; the carpus longer than the meros and slightly narrower; the propodos shorter than the carpus, narrowed towards the dactylos, which is long, slender and slightly curved. Sixth pair of pleopoda longer than the fifth pair, with the rami broad-lanceolate, the outer armed on one border, and the inner on both with slender setæ, the longest of which are about half the length of the ramus, Telson squamiform, cleft, rounded posteriorly.

Length four and a half lines.

Hab. Port Jackson, at depths of about five or six fathoms.

SUB-FAM. PHOXIDES.

Genus PHOXUS, Kröyer.

3

Phoxus villosus, *sp. nov.* (Pl. IX. fig. 2.)

Rostrum as long as the remainder of the cephalon, blunt. Eyes small, oval. Superior antennæ equalling in length the cephalon and rostrum; first segment of the peduncle twice as long as broad, second scarcely two-thirds of the length of the first and

much narrower, provided below with a fasciculus of short hairs; third joint half the length of the second, scarcely distinguished from the articuli of the flagellum; flagellum nearly as long as the peduncle; appendage nearly as long as the flagellum, of about fifteen articuli. Inferior antennæ rather longer than the superior pair; fourth joint of peduncle broad, its upper surface straight, its lower convex and provided with two ridges armed with longish hairs; fifth joint as long as the fourth and of similar shape, but narrower, armed with hair below; flagellum as long as the last two segments of peduncle. Coxæ fringed with slender hairs. Gnathopoda hairy. Anterior pair with the propodos ovoid, twice as long as broad; the palm oblique, defined by a strong tooth. Posterior pair with the propodos similar to that of the anterior, but rather broader, with the palm slightly less inclined to the long axis of the propodos, and the defining tooth larger. Two anterior pairs of pereopoda sub-equal, hairy, their meros and carpus broad. Three posterior pairs serrated and hairy; fourth pair much longer than the others, longer than the pereion; basa of the third and fourth pairs much longer than broad; fifth pair very small, the basos dilated posteriorly, broader than long, its posterior margin armed with fine serrations. Rami of sixth pleopoda broad-lanceolate; outer longer and broader than inner, serrated; inner smooth; both armed with setæ. Telson with the halves broad, compressed, truncate, bordered with a few hairs.

Length seven lines.

Dredged in Port Jackson.

Phoxus Batei, *sp. nov.* (Pl. IX. fig. 3.)

Rostrum as long as the rest of the cephalon, straight, obtuse. Eyes distinct, long-oval. Superior antennæ with the peduncle extending beyond the extremity of the rostrum; first joint of the peduncle nearly as broad as long; second as long as the first, but of only about half the breadth; third joint about one-fourth of

the length of the first ; flagellum longer than the last two segments of the peduncle ; appendage two-thirds of the length of the flagellum, consisting of about six articuli. Inferior antennæ rather longer than the superior ; the penultimate joint of the peduncle broad, its superior border straight and smooth, its inferior border convex, serrate and hairy ; last joint shorter and narrower than the penultimate, serrate, armed with hairs and with two slender spines ; flagellum as long as the two last segments of the peduncle. Coxæ bordered with a few hairs. Gnathopoda similar, subequal : propodos twice as long as broad ; palm very oblique, defined by an acute tooth. Two anterior pairs of pereopoda subequal, stout. Fourth pair of pereopoda longer than the third ; fifth pair shorter, with the bason very broad, but scarcely so broad as long, serrate on its posterior border. Fourth and fifth pairs of pleopoda armed with short acute spines. Sixth pair with the rami unequal ; the outer broad-lanceolate truncate, serrate, bordered with hairs ; the inner about half as long as the outer, narrower, armed with long hairs. Halves of the telson slender.

Length four and a half lines.

Hab. Port Jackson, (dredged.)

This species is at once distinguishable from the preceding by the larger size of the eyes and the form of the fifth pereopods. I have named it after Mr. Spence Bate, F.R.S., to whom every student of the Amphipoda is so much indebted.

SUB-FAM. GAMMARIDES.

Genus PHERUSA, Leach.

Pherusa lævis, *sp. nov.* (Pl. IX., fig. 4.)

Eyes round. Superior antennæ equal in length to the cephalon and first six segments of the pereion ; first two segments of the peduncle subequal ; third scarcely half the length of the second ; flagellum much longer than the peduncle. Inferior antennæ longer

than the superior pair; fourth segment of the peduncle the longest; flagellum nearly twice as long as the peduncle. Anterior gnathopoda with the carpus and propodos subequal, their ventral border armed with serrations beset with fasciculi of fine hairs; propodos rather longer than broad, palm transverse, not defined. Posterior gnathopoda with the carpus triangular, as long as the propodos, which is oblong, more than twice as long as broad, twice as long as the propodos of the anterior pair, with the palm oblique, undefined; both carpus and propodos bordered ventrally with a row of hair-bearing serrations. Third pair of pereiopoda rather shorter than the fourth and fifth, all three bordered with setæ. Rami of posterior pleopoda styliform. Telson triangular, pointed.

Length four and a half lines.

Hab. Kiama, New South Wales.

Genus LEUCOTHOË, Leach.

Leucothoë commensalis, *sp. nov.* (Pl. X., fig. 3.)

Body large and thick. Coxæ of the second pereiopoda deeper than the rest. Eyes ovoid, black. Superior antennæ nearly as long as the cephalon and first three segments of the pereion, one-fourth longer than the inferior pair; first segment of the peduncle very stout, occupying about one-third of the total length; second rather narrower and slightly longer than the first; third short; flagellum as long as the second segment of the peduncle. Peduncle of inferior antennæ equal in length to the two first segments of the peduncle of the superior pair; flagellum very short. Maxillipedes stout, pediform. Anterior gnathopoda rather shorter than the posterior; proximal part of carpus dilated, irregularly heart-shaped; distal prolongation slender, uniform in thickness to near the end, where it tapers to a fine incurved point; propodos about three times as broad as the distal process of the carpus, which it equals in length, slightly narrowed distally, armed

internally with a row of about fifteen short hairs; dactylos fully one-third of the length of the propodos. Posterior gnathopoda having the distal process of the carpus nearly half as long as the propodos, parallel-sided, incurved; propodos equalling in length the cephalon and the first three segments of the pereion, rather more than twice as long as broad, with three small teeth and a row of fine serrations on its palmar border, and a conical tooth on the opposite border at the base of the dactylos; dactylos not quite half as long as the propodos, uniformly curved. Pereiopoda subequal. Three posterior pairs of pleopoda slender, nearly smooth, the protopodite of the fourth pair longer than that of the fifth and sixth, that of the fifth the shortest. Telson elongated; the apex moderately acute.

Colour of larger variety brick-red, or greenish, sometimes light pink with innumerable minute crimson dots.

Length six or seven lines.

This species is one of the commonest Amphipods in Port Jackson and other parts of the coast of New South Wales. One variety—the larger—is found in the pharynx of a common large tunicate, scarcely one of which can be opened without one or more of these crustaceans being found in its interior; it is also common in the cavities of large sponges.

Another variety, distinguished from the first by its smaller size, the greater slenderness of the pereiopoda, and its mottled-crimson colour, inhabits the pharynx of various transparent simple ascidians, and is also found in other situations.

Leucothöë diemenensis, *sp. nov.* (Pl. IX., fig. 5.)

Body broad. Coxæ of the second pereiopoda rather deeper than the others. Eyes round, large. Superior antennæ equal in length to the cephalon and the two first segments of the pereion; first two segments of the peduncle subequal, last short. Inferior antennæ with the peduncle equal in length to that of the superior

pair; the flagellum about half the length of the last segment of the peduncle. Anterior gnathopoda large, in form nearly resembling those of *L. commensalis*. Posterior gnathopoda very large; carpus closely applied to the propodos, its palmar process nearly half as long as the latter, bifurcate at the extremity; propodos exceeding in length the cephalon and first three segments of the pereion, long-oval, with two or three denticles towards the proximal end of the palmar border; dactylos more than half as long as the propodos. Pereiopoda subequal. Sixth pair of pleopoda the longest. Telson lanceolate, acute.

Length six and a half lines.

Hab. Tasmania, (*M.-M.*)

Leucothöë gracilis, *sp. nov.* (Pl. X., fig. 2.)

Coxæ of the second pereiopoda not deeper than the others. Superior antennæ equal in length to the cephalon and the two first segments of the pereion; first joint of the peduncle stout; second equal to the first in length, but narrow; third about half the length of the second; flagellum scarcely so long as the second segment of the peduncle. Peduncle of the inferior antennæ equal in length to that of the superior pair; flagellum shorter than the last segment of the peduncle. Anterior gnathopoda large, hardly distinguishable in form from those of *L. commensalis*; carpus equal in length to the cephalon and first two segments of the pereion. Posterior gnathopoda very large, as long as the cephalon and pereion, similar in shape to those of *L. commensalis*; propodos equalling in length the cephalon and two first segments of the pereion. Two anterior pairs of pereiopoda (wanting). Three posterior pairs subequal, very small and weak. Three posterior pairs of pleopoda long; the fourth and sixth subequal; the fifth shorter. Telson triangular, pointed.

Length five lines.

Hab. Tasmania, (*M.-M.*)

This species is mainly characterised by the uniformity of the anterior coxæ and the feebleness of the pereopoda.

Genus MELITA, Leach.

Melita australis, *sp. nov.* (Pl. IX., figs. 6 and 7.)

Four anterior segments of the pleon with their posterior dorsal border concave, and armed with two to six acute teeth. Eyes small round. Superior antennæ three-fourths of the length of the body; first joint of the peduncle stout, shorter than the second, flagellum longer than the peduncle. Inferior antennæ two-thirds of the length of the superior pair; flagellum shorter than peduncle. Anterior gnathopoda with the carpus and propodos of equal length; the former sub-triangular; the latter quadrate, the palm defined by a small spine; the dactylos curved. Posterior gnathopoda unequal in the male; the right resembling the anterior pair in form, but longer, the palm not defined, the left with the meros produced posteriorly into an acute spine, the propodos six times as long as that of the anterior pair, subtriangular, with the apex rounded, the base (palm) oblique, slightly concave, and armed with three teeth, the antero-inferior angle produced into a stout palmar process grooved internally for the lodgement of the dactylos when the hand is closed; dactylos geniculate at base, slightly curved at apex. Three posterior pairs of pereopoda large serrate, hirsute, the third pair shorter than the others. Fourth pair of pleopoda longer than the rest; last pair with the inner ramus rudimentary, the outer long foliaceous, serrate. Telson two-branched, hirsute.

Length four lines.

Hab. Port Jackson (very common); Tacking Point, (*M.-M.*)

The size of the larger posterior gnathopod and the form of the teeth on the palm vary considerably.

Melita (?) *Ramsayi*, *sp. nov.* (Pl. X., fig. 1)

Posterior border of the three first segments of the pleon armed with short hairs; fourth and fifth segments with an acute mesial

tooth and a few hairs. Superior antennæ as long as the cephalon and pereion; first two segments of the peduncle elongate, second longer than the first; third segment very short; flagellum rather shorter than the peduncle; appendage seven-jointed. Inferior antennæ with the peduncle equal in length to that of the superior pair; first segment the shorter, second the longest; flagellum about equal in length to the last segment of the peduncle. Anterior gnathopoda with the carpus and propodos subequal, hairy; the latter broad; palm oblique, armed with a few short denticles. Posterior gnathopoda unequal: right the largest, its carpus closely applied to the propodos; propodos more than thrice as long as that of the anterior pair, oblong, slightly longer distally than proximally, its length equal to nearly twice its least breadth; palm nearly transverse, defined by a strong, pointed, slightly curved tooth, and armed with three other large compressed teeth: left with the propodos about two-thirds of the length of that of the right, of similar shape, but having the palm rather more oblique, slightly convex, minutely crenulated, armed with a single small defining tooth. Three posterior pairs of pereopoda serrated and hairy, rather shorter than the fourth and fifth. Posterior pleopoda (wanting). Telson with each division armed terminally with a sharp tooth and a few long hairs.

Length five lines.

Hab. Port Jackson (dredged).

I have named this species after Mr. E. P. Ramsay, Curator of the Australian Museum, Sydney, to whom I am indebted for the loan of specimens of this and of several other species herein described.

Genus MEGAMCERA, Spence Bate.

Megamcera Mastersii, *sp. nov.* (Pl. XI., fig. 1.)

Eyes rather small, oval. Superior antennæ more than half the length of the body; first two articulations of the peduncle subequal; third small; flagellum as long as the peduncle; appendage

short, of four segments. Inferior antennæ with the peduncle rather longer than that of the superior pair; flagellum as long as the last segment of the peduncle. Anterior gnathopoda with the carpus and propodos sub-equal, both armed with hairs below; the latter having the dorsal border nearly straight, the palmar border strongly convex and armed with four small teeth. Posterior gnathopoda having the meros, carpus and propodos hairy behind, the meros armed behind with a sharp tooth, the carpus slightly produced at its postero-distal angle, closely applied to the propodos; propodos nearly twice as large as that of the anterior pair; its dorsal border gently convex; palm well-defined, toothed. Coxæ of the two anterior pairs of pereopoda much deeper than those of the three posterior pairs. Basos of posterior pereopoda long-ovate, serrated on the borders; meros broad, strongly convex, produced to an acute point at its distal and posterior angle; meros and carpus armed at their distal ends with a few bristles. Fourth and fifth pairs of pleopoda sub-equal; sixth pair with the protopodite short and broad, the rami broad-lanceolate, and armed along the borders with about twenty bristle-bearing serrations. Telson triangular, blunt, with three small teeth at the extremity, and a notch armed with a single seta near the distal end of the inner border.

Length five lines.

Hab. Port Jackson.

Megamoera diemenensis, *sp. nov.* (Pl. XI., fig. 3.)

First four segments of the pleon each with a pair of strong spines on its posterior margin near the middle dorsal line. Eyes reniform. Superior antennæ more than half the length of the body; first segment of the peduncle stout, as long as the cephalon and the first segment of the pereion, second segment narrower and longer; third segment short; flagellum longer than the peduncle; appendage short, of four articuli. Inferior antennæ with the peduncle nearly equal in length to the two first segments.

of the peduncle of the superior pair; flagellum shorter than the peduncle. Anterior gnathopoda small; carpus and propodos sub-equal, hairy; propodos irregularly ovate; palm straight, oblique, undefined. Posterior gnathopoda large; meros armed behind with a short spine; carpus short, closely applied to the propodos; propodos four times as long as that of the anterior pair; broad proximally, becoming narrower towards the distal end; dactylos curved, bent on the inner side of the propodos when closed. First and second pereopoda sub-equal. Three posterior pairs very broad; meros expanded posteriorly, and, together with the carpus and propodos, serrated and armed with setæ; third pair shorter than the fourth and fifth; basos of fifth pair much broader than that of the others. Rami of the posterior pleopoda sub-equal, twice as long as the protopodite, foliaceous, armed with setæ along the margins. Telson with the halves laterally compressed, each terminating in two acute spines, and armed with a few short setæ.

Length nine lines.

Hab. Tasmania (*M.-M.*)

Genus *MCERA*, Leach.

Mcera rubro-maculata, (Pl. X., fig. 4.)

Gammarus rubro-maculatus, *Stimpson, Proc. Acad. Nat. Sci., Philad.*, July 1855.

Coxæ shallower than their respective segments, fifth pair deeper than fourth. Superior antennæ half as long as the body, the peduncle rather shorter than the flagellum; first two segments rather long, third short; appendage of seven segments. Inferior antennæ a little more than half the length of the superior pair; flagellum less than half the length of the peduncle. Anterior gnathopoda rather large, hirsute below; carpus broad, triangular; propodos irregularly ovate, as long as the cephalon. Posterior gnathopoda much larger than the anterior pair; meros with a

sharp spine behind; carpus hairy; propodos as long as the cephalon and two first segments of the pereion, ovate, its palm strongly convex, defined by a small tooth, its dorsal border nearly straight. Two anterior pairs of pereiopoda sub-equal, their coxæ little more than half the depth of their respective segments; meros produced anteriorly at its distal end. Three posterior pairs of pereiopoda hairy, the third pair the shortest, the fourth the longest; basos narrow, its posterior border serrated and armed with a sharp tooth at the distal end. Lateral plates (epimera) of the three anterior segments of the pleon serrated posteriorly. Fourth pair of pleopoda longer than fifth, both provided with setæ on the protopodite and rami. Last pair of pleopoda very large, biramous, the rami foliaceous, long-ovate, emarginate; their margins serrate, the serrations and the extremity armed with setæ. Telson of two short, cylindrical rami, each with one or two setæ. Colour light pink, striped and spotted with crimson.

Length six lines.

Hab. Port Jackson; common at low-water mark and in depths of a few fathoms.

Mcera spinosa, *sp. nov.* (Pl. X., fig. 5.)

Posterior margin of the three anterior segments of the pleon armed with a few acute teeth or spines. Coxæ much shallower than their respective segments. Lateral plate of the third segment of the pleon serrated posteriorly. Eyes long-oval. Superior antennæ more than half the length of the body; first segment of the peduncle as long as the cephalon and the first segment of the pereion; second rather longer; third very short; flagellum as long as the peduncle; appendage nearly half as long as the flagellum. Inferior antennæ more than half as long as the superior pair; third segment of the peduncle equal in length to the first segment of the pereion; fourth twice as long as the third; fifth as long as the cephalon; flagellum as long as the fifth segment of the peduncle. Anterior gnathopoda hairy; carpus

rather longer than the propodos; the latter ovate; palm oblique, notched. Posterior gnathopoda with the propodos large, ovate, more dilated in the male than in the female, palm defined by a strong, acute tooth, and armed in the male with two other prominent teeth. Two anterior pairs of pereopoda sub-equal. Third pair rather shorter than the fourth and fifth; basos of the three posterior pairs produced at its postero-distal angle; meros carpus and propodos serrated and hairy. Fifth pair of pleopoda much shorter than the fourth. Sixth pair large, with a stout protopodite and two broad-lanceolate rami; the latter serrated and armed with setæ. Telson double, each half ending in a sharp spine, and armed with a bundle of stiff setæ.

Length eight lines.

Hab. Tasmania (*M.-M.*)

FAM. COROPHIIDÆ.

SUB-FAM. PODOCERIDES.

Genus AMPHITHOË, Leach.

Amphithoë cinerea, *sp. nov.* (Pl. XI., fig. 4.)

Eyes round, projecting, almost colourless. Superior antennæ more than half of the length of the body; first segment of the peduncle shorter than the second; third joint very short; flagellum much longer than the peduncle. Inferior antennæ shorter than the superior pair; flagellum shorter than the last two segments of the peduncle. Anterior gnathopoda with the propodos long-ovate, armed with hairs, the palm oblique, undefined. Posterior gnathopoda with the propodos broader, but rather shorter than that of the anterior pair, hairy; palm oblique, convex, devoid of teeth, but with a tubercle near its distal end. Two anterior pairs of pereopoda sub-equal, stoutish. Third pair with the basos sub-circular; basa of fourth and fifth pairs oval. Posterior pleopoda rather short, the rami not extending so far as those of the fifth pair; the outer ramus short, armed with two hooks; the inner

slightly longer, broader, compressed, armed with a few short setæ. Telson sub-triangular, blunt.

Colour ashy-grey.

Length eight lines.

Hab. Port Jackson.

Amphithoë grandimanus, sp. nov.

Nearly allied to the preceding; distinguished by the size and form of the posterior gnathopoda, which are very much larger than the anterior pair, with the propodos broad, irregularly ovoid; the palm oblique, deeply excavated, its border waved, defined posteriorly by a strong tooth.

Length eight lines.

Hab. Port Jackson.

Amphithoë setosa, sp. nov.

Eyes small, round, red. Superior antennæ nearly as long as the body; first two segments of the peduncle sub-equal, third about one-third of the length of the second; flagellum twice as long as the peduncle. Inferior antennæ nearly as long as the superior pair; ornamented with long hairs; flagellum as long as the last two segments of the peduncle. Anterior gnathopoda rather large; meros produced into an acute process at its infero-distal angle; carpus sub-triangular, longer than the meros or propodos; propodos ovate; palm oblique, undefined. Posterior gnathopoda larger than the anterior pair, fringed with long slender hairs; meros and carpus short, both slightly produced at the infero-distal angle; propodos more than twice as long as the carpus, rather longer than that of the anterior pair, ovate, swollen; palm oblique, defined by a small tooth. Colour light brown with minute black dots.

Hab. Rock-pools at Botany Bay.

This species differs from *A. cinerea*, in the greater length of the superior antennæ, the presence of long hairs on the lower antennæ, and the greater size of the posterior gnathopoda.

Genus MICRODEUTEROPUS, Costa.

Microdeuteropus australis, *sp. nov.* (Pl. XI., fig. 5.)

Superior antennæ longer than the cephalon and pereion; peduncle armed with a few hairs; first segment nearly as long as the cephalon, stout; second twice as long as the first, slender; third very short; flagellum longer than peduncle, a few short hairs on each articulus. Inferior antennæ nearly two-thirds of the length of the superior pair; peduncle armed with a few hairs, the second joint the longest; flagellum shorter than the last segment of the peduncle, armed with hooked setæ. Anterior gnathopoda large, sub-chelate; meros small, narrow; carpus large, armed with a few scattered hairs; propodos smaller than the carpus, irregularly quadrate, rather longer than broad, armed with a few hairs; palm short, scarcely oblique, deeply excavate, minutely denticulated, bounded by a triangular tooth; dactylos stout, a row of acute denticles on its inner border. Posterior gnathopoda smaller than the anterior pair; carpus and propodos sub-equal, serrated on their ventral border, armed with fasciculi of hairs; propodos ovate, half as broad as long, palm not defined, nearly transverse; dactylos stout, about one-third of the length of the propodos, armed on its inner border with a series of acute denticles. Second pair of pereiopoda longer than the first; dactylos in both long, slender. Posterior pereiopoda (wanting). Posterior pleopoda biramous, the rami shorter than those of the preceding pairs, lanceolate, with a few short, nearly straight setæ along the borders and at the extremity. Telson large, armed with a few short hairs.

Length three and a half lines.

Hab. Port Jackson.

Genus *XENOCHIEIRA*, (*novum*).

Char. gen. Body slender Coxæ small. Superior antennæ very long, longer than the inferior pair, with a secondary appendage. Mandibles with an appendage. Both pairs of gnathopoda non-subchelate, armed with very long hairs; carpus of posterior pair broad, plate-like, applied to the anterior (dorsal) border of the meros. Posterior pleopoda biramous. Telson simple.

Xenochieira fasciata, *sp. unic.* (Pl. XI., fig. 6.)

Eyes round. Superior antennæ as long as the cephalon and pereion; first joint of the peduncle stout, rather longer than the cephalon; second rather longer and narrower than the first; third not one-half of the length of the second; flagellum longer than the peduncle, slender; appendage short, of five segments. Inferior antennæ with the peduncle longer than that of the superior pair; fourth segment the longest; flagellum shorter than the last segment of the peduncle, of nine articuli, each armed with one or two curved spines and a few hairs. Maxillipedes non-unguiculate; the borders of the ischial scale and of the palp armed with a close fringe of long hairs. Anterior gnathopoda sub-pediform, stout; carpus triangular, short; propodos nearly twice as long as the carpus, narrow, its superior border slightly convex, its inferior straight; dactylos terminal, large, its inner border armed with a series of sharp denticles. Posterior gnathopoda with the ischium sub-triangular, articulating with both meros and carpus; the latter broad, squamiform, with a close fringe of long hairs; the former narrow; propodos narrow, subequal with that of the anterior gnathopoda; dactylos very short. Pereiopoda? Fourth and fifth pairs of pleopoda armed with a few acute spines. Posterior pleopoda with the rami narrow, bordered with a few setiferous serrations and armed terminally with a small number of slender hairs. Telson scale-like, very short.

Length three and a half lines.

Hab. Port Jackson.

Genus HAPLOCHEIRA, (*novum*).

Body not much compressed laterally. Upper and lower antennæ subequal; superior pair without an appendage; inferior subpediform. Both pairs of gnathopoda simple, fringed with long hair. Posterior pleopoda biramous, with unequal rami. Telson single?

Haplocheira typica, *sp. nov.* (Pl. XI., fig. 2.)

Superior antennæ as long as the cephalon and first three segments of the pereion; first and second segments of the peduncle of nearly equal length, first stouter than second; third half as long as the latter; flagellum as long as the last two segments of the peduncle, hairy. Inferior antennæ subequal with the superior pair; peduncle armed with a few hairs, longer than that of the superior pair, fourth and fifth joints subequal; flagellum shorter than the last segment of the peduncle, composed of four articuli, each armed with pointed, slightly hooked spines and a few short hairs. Anterior gnathopoda with the propodos long and narrow; the meros, carpus and propodos fringed with long slender hairs. Posterior gnathopoda longer and more slender than the anterior pair, bordered like the latter with numerous long delicate hairs; ischium and meros small; carpus and propodos of nearly equal length—the latter tapering distally; dactylos small. Pereiopoda short, stout; three anterior pairs subequal, fourth and fifth longer. Fourth pair of pleopoda armed on the protopodite and each ramus with a row of spines which are acute and slightly curved at the tip; fifth pair shorter than the fourth, armed with similar but shorter spines; sixth pair with the rami short conical unequal, the outer armed with a few short stout spines, the inner terminated by a few hairs. Telson cleft, armed with short blunt spines. Colour dark grey.

Length three and a half lines.

Hab. Port Jackson; under stones at low-water mark.

SUB-FAM. COROPHIIDES.

Genus CYRTOPHIUM, Dana.

Cyrtophium parasiticum, *sp. nov.* (Pl. XII., fig. 1.)

Superior antennæ exceeding the body in length, hairy; the flagellum shorter than the last segment of the peduncle. Inferior antennæ nearly once and a half the length of the body, armed with long hairs; third and fourth segments of the peduncle subequal; fifth shorter. Anterior gnathopoda hairy; propodos shorter than the carpus, ovate. Posterior gnathopoda very large; propodos as long as the cephalon and the three first segments of the pereion; palmar border with a shallow excavation near the middle of its length, armed distally with fine denticles. Pereiopoda subequal. Protopodite of the fourth pleopoda stout; inner ramus longer and stouter than the outer, both armed with a few setæ. Fifth pleopoda (wanting). Sixth pleopoda short, foliaceous, ovate. Telson simple, squamiform, blunt.

Length, inclusive of antennæ, four-and-a-half lines.

Found clinging in considerable numbers on the surface of a species of *Cucumaria*, (*C. pentagona*, Quoy et Gaim.) dredged in a depth of three or four fathoms in Port Jackson.

Genus ICILIUS, Dana.

Icilius australis, *sp. nov.* (Pl. XII., fig. 2.)

Pereion ovate, first two segments very short. Eyes red, very prominent. Superior antennæ much smaller than the inferior pair, nearly as long as the body with a uni-articulate appendage; third joint of the peduncle shorter than the others; flagellum longer than the peduncle. Peduncle of inferior antennæ very stout, as long as the superior pair. Maxillipedes unguiculate, hairy, provided with squamiform plates. Gnathopoda subequal, slender, unguiculate, provided with long hairs; the carpus rather longer than the propodos. Last pair of pereiopoda longer than

the others. Fifth pleopoda with the inner ramus larger than the outer. Inner ramus of sixth pleopoda foliaceous, outer small, long-ovate.

Length about three lines.

Hab. Port Jackson. (Dredged.)

The nearest ally of the present species appears to be *Icilius ellipticus*, (Dana, U. S. Explor. Exped., p. 844., pl. 56., fig. 4. Spence Cate, Cat. Amph., p. 285., pl. 47., fig. 10.) obtained in the north of Borneo, with which it is sufficiently closely connected to be placed in the same genus. The geographical distribution of this genus will be a matter of great interest.

GROUPE ABERRANTIA.

FAM. CAPRELLIDÆ.

Genus PROTO, Leach.

Proto Novæ-Hollandiæ, *sp. nov.* (Pl. XII., fig. 3.)

Animal smooth, constricted at the joints. Superior antennæ about one-third of the length of the body; basal joint of peduncle thick, shorter than the others; second joint the longest; flagellum shorter than the second and third segments of the peduncle. Inferior antennæ more than half the length of the superior; peduncle more than twice as long as the flagellum. First pair of gnathopoda with the propodos broad, the palm oblique, slightly convex, armed with a series of short spines, and defined by a strong tooth surmounted by a spine. Posterior pair with the propodos ovate, swollen, three times as long as that of the first pair. First pair of pereopoda slender, as long as the second and third segments of the pereion, with a slight tooth on the posterior margin of the propodos. Second pair much larger than the first or third, rather longer than the cephalon and the first two segments of the pereion, the carpus, propodos and dactylos short, the propodos armed with four spines and a row of serrations on its

anterior border. Third pair very slender, equal to the first in length. Fourth and fifth pairs sub-equal, of the same length as the second, but stouter; a few spines on the carpus and propodos.

Length about seven lines.

Hab. Port Jackson.

Genus *PROTELLA*, Dana.

Protella australis, *sp. nov.* (Pl. XII., fig. 4.)

Cephalon armed above with a single short, anteriorly-directed spine. Superior antennæ nearly as long as the body; peduncle stout; the second joint the longest; flagellum as long as the last segment of the peduncle. Inferior antennæ as long as the first two segments of the peduncle of the superior pair; flagellum very short. First pair of gnathopoda with the propodos sub-triangular, broad at the base, which is nearly straight, with straight, gradually converging lateral borders; dactylos more than two-thirds of the length of the propodos. Posterior gnathopoda with the propodos longer than the cephalon, oval; palmar border armed with a fringe of hairs and with two strong conical teeth near the apex and another near the base. Posterior pereopoda subequal; propodos with a tooth on its anterior border.

The form of the posterior gnathopoda varies in different individuals, and the cephalic spine is sometimes rudimentary. The female of this species differs from the male only in possessing the ovigerous plates.

Length seven lines.

Hab. Port Jackson.

Genus *CAPRELLA*, Lam.

Caprella tenuis, *sp. nov.* (Pl. XII., fig. 5.)

Cephalon elongated, the upper border terminating anteriorly in an inconspicuous acute tooth. First segment of the pereion longer than, second and third sub-equal with, the cephalon; the

rest shorter. Superior antennæ as long as the cephalon and the first two segments of the pereion; flagellum as long as the last two segments of the peduncle. Inferior antennæ longer than the peduncle of the upper pair, ornamented below with a fringe of long hairs. Propodos of anterior gnathopoda ovate, swollen. Propodos of posterior gnathopoda two and a half times the length of that of the anterior pair, narrow; the palm defined by an obscure tooth. Branchiæ longish-ovoid. Pereiopoda stout, short, increasing in length from before backwards; the third pair as long as the fourth and fifth segments of the pereion.

Length six lines.

Hab. Port Jackson.

EXPLANATION OF THE PLATES.

Plate VII.

- Fig. 1.—*Talitrus sylvaticus*; a.—anterior gnathopod; b.—posterior gnathopod of ♂; b'.—posterior gnathopod of ♀; c.—maxillipedes; d.—mandibles.
- Fig. 2.—*Orechestia Macleayana*; a.—anterior gnathopod; b.—posterior gnathopod of ♂; d.—posterior gnathopod of ♀.
- Fig. 3.—*Talorchestia quadrimana*; a.—anterior gnathopod of ♂; b.—posterior gnathopod of ♀; c.—anterior gnathopod of ♀ (connected wrongly with b. of fig. 2.); d.—maxillipedes; e.—mandible.
- Fig. 4.—*Allorchestes longicornis*; a.—anterior gnathopod; b.—posterior gnathopod.
- Fig. 5.—*Allorchestes crassicornis*; a.—anterior gnathopod; b.—posterior gnathopod.
- Fig. 6.—*Talorchestia diemenensis*; a.—anterior gnathopod of ♂; b.—anterior gnathopod of ♀; c.—posterior gnathopod of ♂; d.—posterior gnathopod of ♀.

Plate VIII.

- Fig. 1.—*Allorchestes rupicola*; a.—anterior gnathopod; b.—posterior gnathopod.
- Fig. 2.—*Stegocephalus latus*; a.—anterior gnathopod; b.—posterior gnathopod; c.—maxillipedes.
- Fig. 3.—*Amaryllis macrophthalmus*; a.—anterior gnathopod; b.—posterior gnathopod; c.—mandibles; d.—maxillipedes; x.—posterior pleopoda and telson.
- Fig. 4.—*Neobule algicola*; a.—anterior gnathopod; b.—posterior gnathopod.
- Fig. 5.—*Lysianassa nitens*; a.—anterior gnathopod; b.—posterior gnathopod.
- Fig. 6.—*Glycera tenuicornis*; a.—anterior gnathopod; b.—posterior gnathopod; c.—second maxille; d.—mandible.

Plate IX.

- Fig. 1.—*Ampelisca australis*; a.—anterior gnathopod; b.—posterior gnathopod; c.—telson; d.—maxillipede.
- Fig. 2.—*Phoxus villosus*; a.—anterior gnathopod; b.—posterior gnathopod.
- Fig. 3.—*Phoxus Batei*; a.—anterior gnathopoda; b.—posterior gnathopod.
- Fig. 4.—*Pherusa laevis*; a.—anterior gnathopod; b.—posterior gnathopod.
- Fig. 5.—*Leucothoë diemenensis*.
- Fig. 6.—*Melita australis* ♀; a.—anterior gnathopod; b.—posterior gnathopod; c.—posterior pleopod.
- Fig. 7.—*Melita australis* ♂; a.—anterior gnathopod; b.—posterior gnathopod (right).

Plate X.

- Fig. 1.—*Melita* (?) *Ramsayi*; a.—anterior gnathopod; b.—posterior gnathopod (left.)
- Fig. 2.—*Leucothoë gracilis*.
- Fig. 3.—*Leucothoë commensalis*.
- Fig. 4.—*Mæra* (*Gammarus*) *rubromaculata*; a.—anterior gnathopod; x.—posterior pleopod.
- Fig. 5.—*Mæra spinosa*; a.—anterior gnathopod; b.—posterior gnathopod.

Plate XI.

- Fig. 1.—*Megamæra Mastersii*; a.—anterior gnathopod; b.—posterior gnathopod; c.—posterior pleopoda and telson.
- Fig. 2.—*Haplocheira typica*; a.—anterior gnathopod; b.—posterior gnathopod.
- Fig. 3.—*Megamæra diemenensis*.
- Fig. 4.—*Amphithoë cinerea*; a.—anterior gnathopod; b.—posterior gnathopod.
- Fig. 5.—*Microdeuteropus australis*; a.—anterior gnathopod; b.—posterior gnathopod.
- Fig. 6.—*Xenocheira fasciata*; a.—anterior gnathopod; b.—posterior gnathopod; c.—maxillipede.

Plate XII.

- Fig. 1.—*Cyrtophium parasiticum*; a.—anterior gnathopod of ♂; a ♀.—anterior gnathopod of ♀; b ♀.—posterior gnathopod of ♀; x.—telson and two posterior pairs of pleopoda.
- Fig. 2.—*Icilius australis*; a.—anterior gnathopoda; b.—mandible; c.—maxillipede.
- Fig. 3.—*Proto novæ-hollandiæ*; a.—propodos of second pereopod; b.—posterior gnathopod; c.—anterior gnathopod.
- Fig. 4.—*Protella australis*; a.—anterior gnathopod; b.—posterior gnathopod.
- Fig. 5.—*Caprella tenuis*; a.—anterior gnathopod.

NOTE ON THE *Phyllosoma* STAGE OF *Ibacus Peronii*, LEACH.

BY WILLIAM A. HASWELL, M.A., B.Sc.

I have had the opportunity lately of examining a specimen of a glass-crab or *Phyllosoma*, which seems to be the young of the highly specialised macrourous decapod *Ibacus Peronii*, and, as it is somewhat rare to obtain these larvæ at the stage when—though still essentially *Phyllosomæ*—they shew unmistakeably to what species they belong, it is perhaps worthy of notice and description.

The specimen, (which was obtained in Port Jackson and is in Mr. Macleay's Collection) is thirteen lines in length and eight in greatest breadth. Its cephalic shield is of quadrilateral form, with the angles rounded off; anteriorly it presents a deep, broad, mesial excavation at the bottom of which the anterior cephalic appendages are inserted, its antero-lateral angles reaching as far forward as the penultimate joint of the peduncle of the internal antennæ; posteriorly it is terminated by a concave edge. Its dorsal surface is covered with a number of somewhat irregular radiating rugæ, has a deep longitudinal mesial depression along the centre of which runs an irregular ridge, and presents on each lateral half, about midway between the lateral margin and the middle line, a sinuous ridge terminating anteriorly in a flattened triangular-pointed process situated immediately behind and external to the base of the outer antennæ. This shield has still an essentially larval character; it approximates, however, towards that of the adult in the possession of the three ridges above mentioned. The eye-peduncles are very long; the second joint and the eye itself are compressed. The antennules equal the eyes in length; the segments of their peduncle are subequal; the outer flagellum is stouter and somewhat shorter than the inner, which is about half as long as the peduncle.

It is in the structure of the antennæ that this form shews its parentage most unmistakably. These organs, as in *Ibacus* and the rest of the *Seyllarina*, have the first segment coalescent with the sternum of the antennary somite; on its ventral surface is a perforated tubercle representing the so-called "green-gland" of the adult; the second segment is short and broad; the third has a basal part, of similar form to the second segment, and armed internally with a strong, curved, pointed spine, and an external expanded foliaceous portion, of oval pointed form, and armed along its outer border with three small teeth; the fourth segment resembles the basal portion of the third, and has a similar spine on its inner surface; the terminal segment is phylloid, oval, pointed, armed on its inner border with four strong, triangular, pointed teeth and on its outer with a single obscure denticle. The structure of the antennæ in *Ibacus* is almost precisely similar to this, save that the form of the phylloid expansions is somewhat altered, and the number of teeth on them increased.

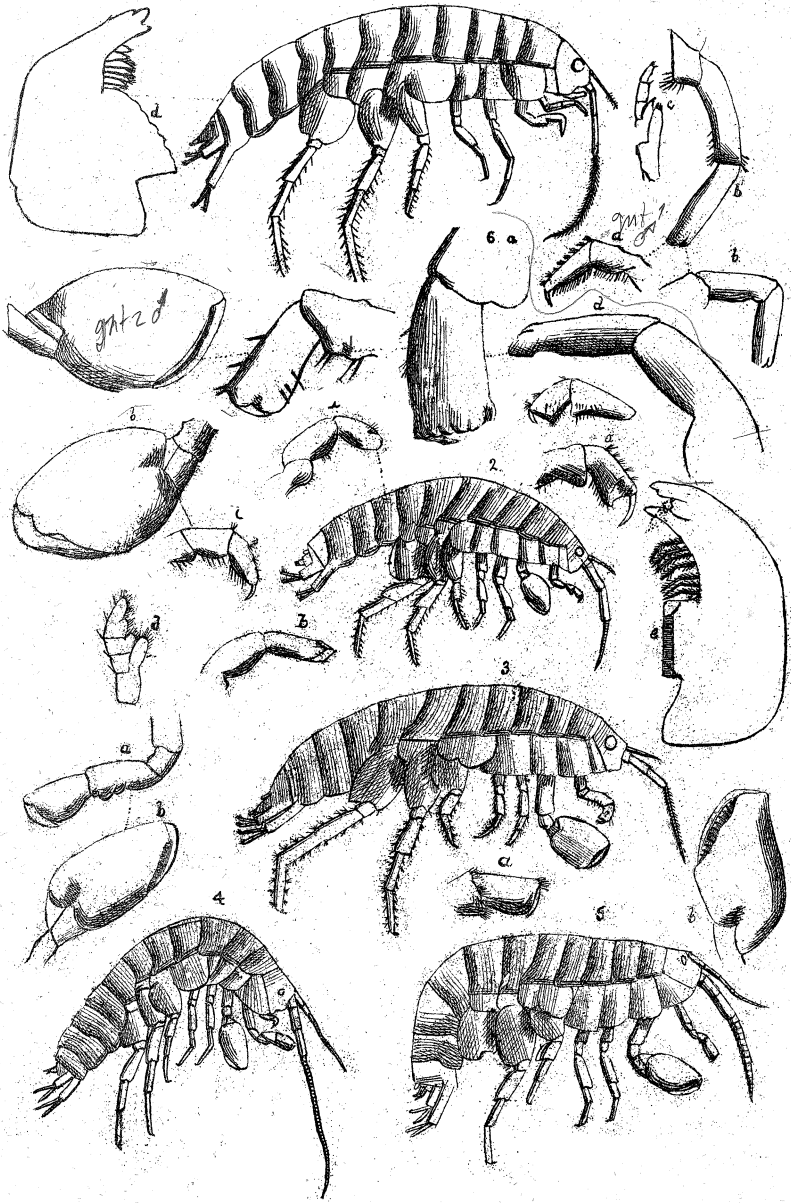
The labrum is large and prominent. The mandibles are still membranous. The first maxillæ have the exopodite rather longer than the endopodite, and both armed with several setæ, which are longer on the latter. The second maxillæ are large and foliaceous; the endopodite is a simple, blunt process, with a crenated internal border; the scaphognathite is large, the exopodial portion which is slightly truncate anteriorly, is twice as long as the endopodite; the epipodial part is shorter than the exopodite, broad and rounded. The first maxillipedes are rudimentary consisting of a short process to which three branchial (?) filaments are attached. The maxillipedes of the second pair consist of four segments; their extremity reaches the front of the labrum; the appendage on their second segment is short. The third pair of maxillipedes, which have five articulations, are about five times as long as the second; their appendage is about equal in length to that of the latter.

The thoracic shield is rather longer than broad, and excavated posteriorly. The last pair of thoracic limbs are about two-thirds of the length of the penultimate pair, and provided with a well-developed dactylos.

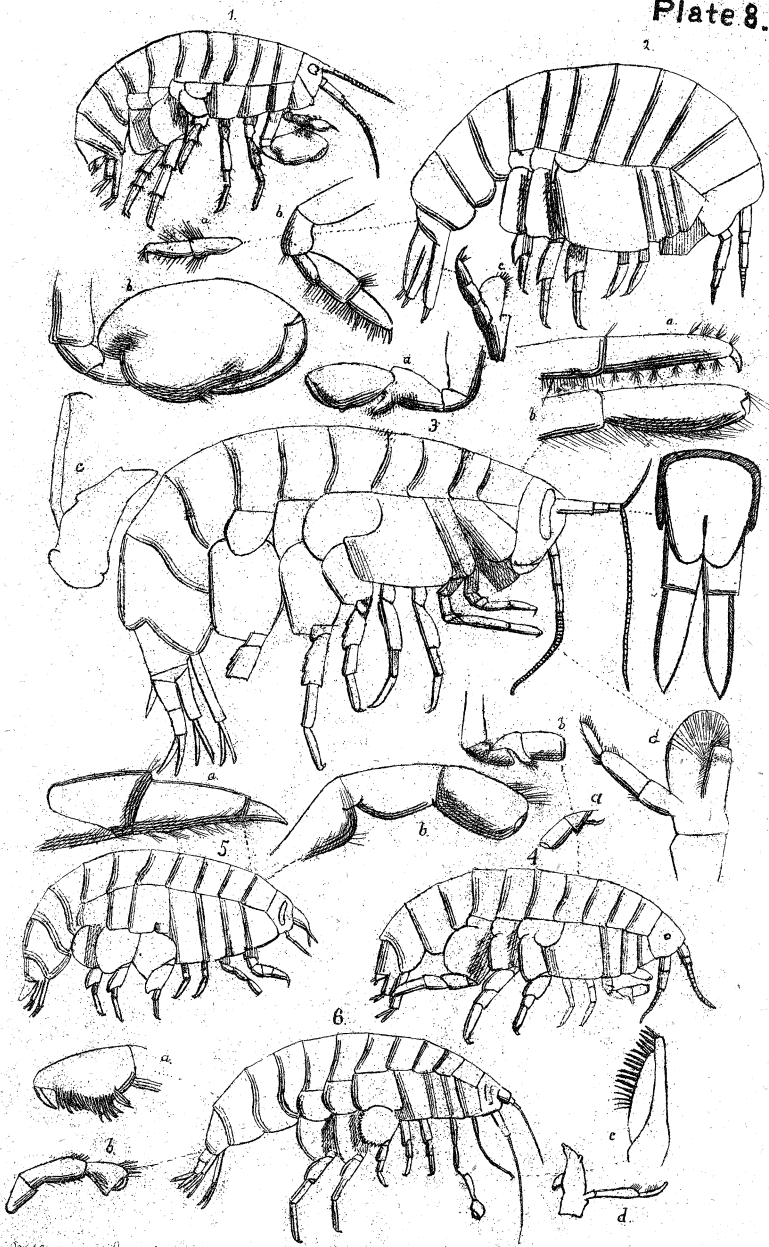
The abdomen nearly equals the thorax in length; the transverse diameter of its segments is about three times the antero-posterior, the former diminishing slightly posteriorly; the abdominal segments (as also the last segment of the thorax) have each, as in *Ibacus*, a mesial dorsal carina ending on the posterior border in a small conical tooth; the pleura are very prominent, and resemble those of the adult; but they are more strongly curved backwards; those of the penultimate segment have two triangular teeth (represented in *Ibacus Peronii*) on their posterior border. The abdominal appendages have both rami slender and tapering; the endopodite has a small, tooth-like internal process. The form of the telson agrees precisely with that of the corresponding structure in *Ibacus Peronii*.

It is not unlikely that the *Phyllosoma Duperreyi* of Guérin, (*Voyage de Duperrey, Zool.*, t. II., p. 2, p. 46; pl. 5, fig. 2; *Mag. d'Ent.*, 1830, 4 me. livraison, pl. 12), which, like the present form was obtained in Port Jackson, may be an earlier stage in the development of the same animal—the antennæ and abdomen being less highly specialised.

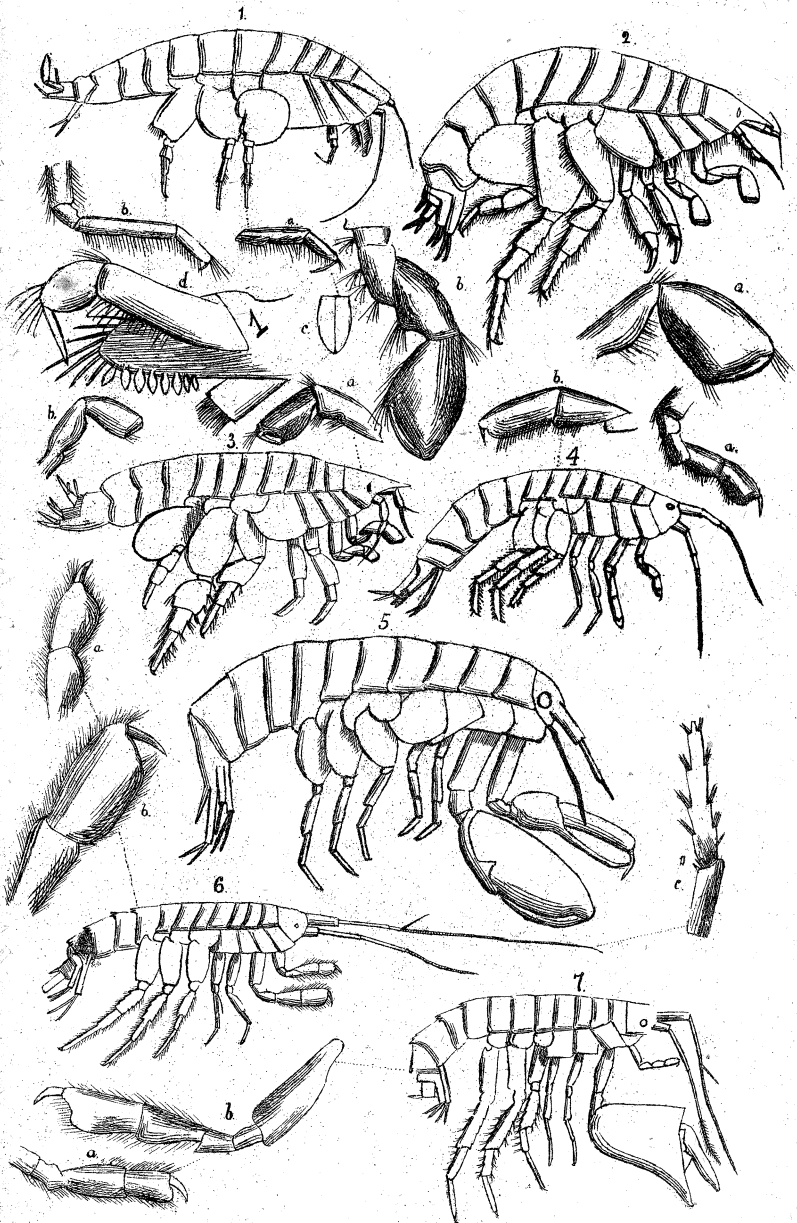
Plate 7.



M. Wilson. A. Sarswold del.



William A. Haswell del.



William A. Haswell del.

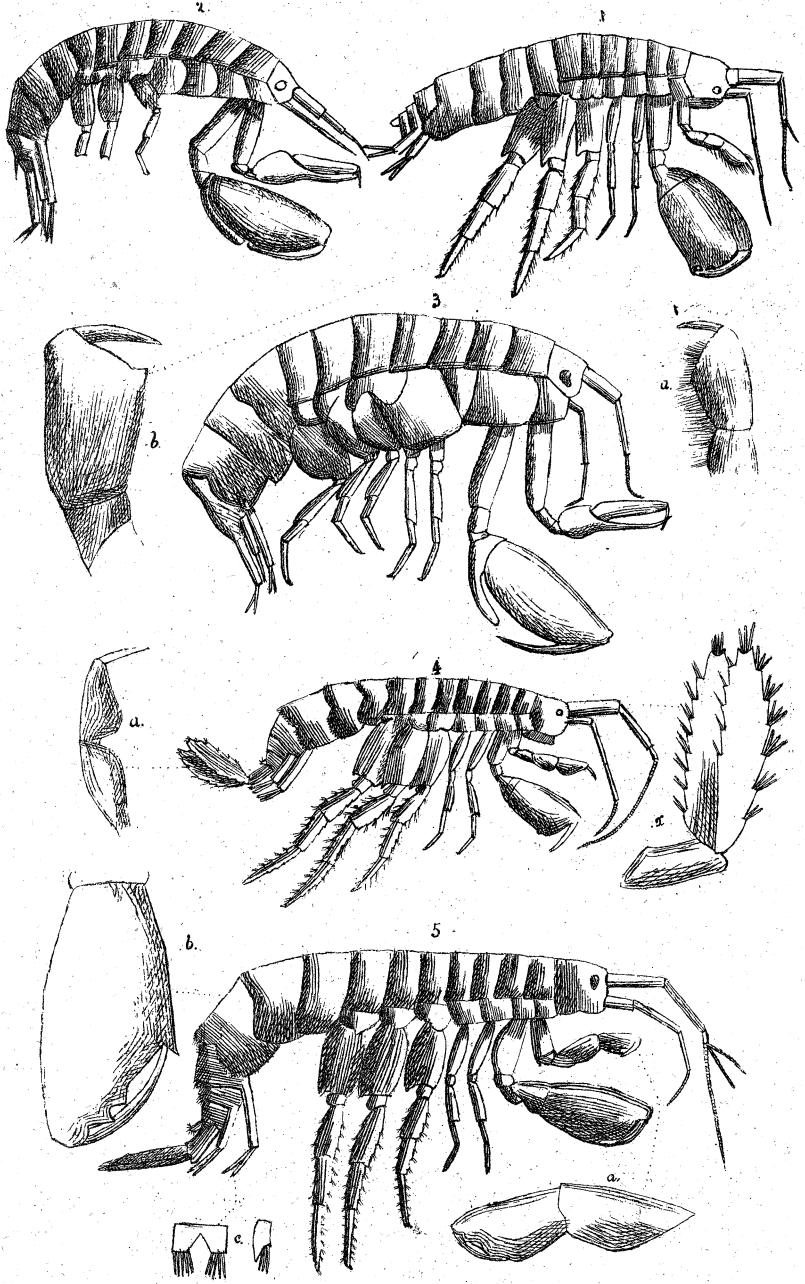
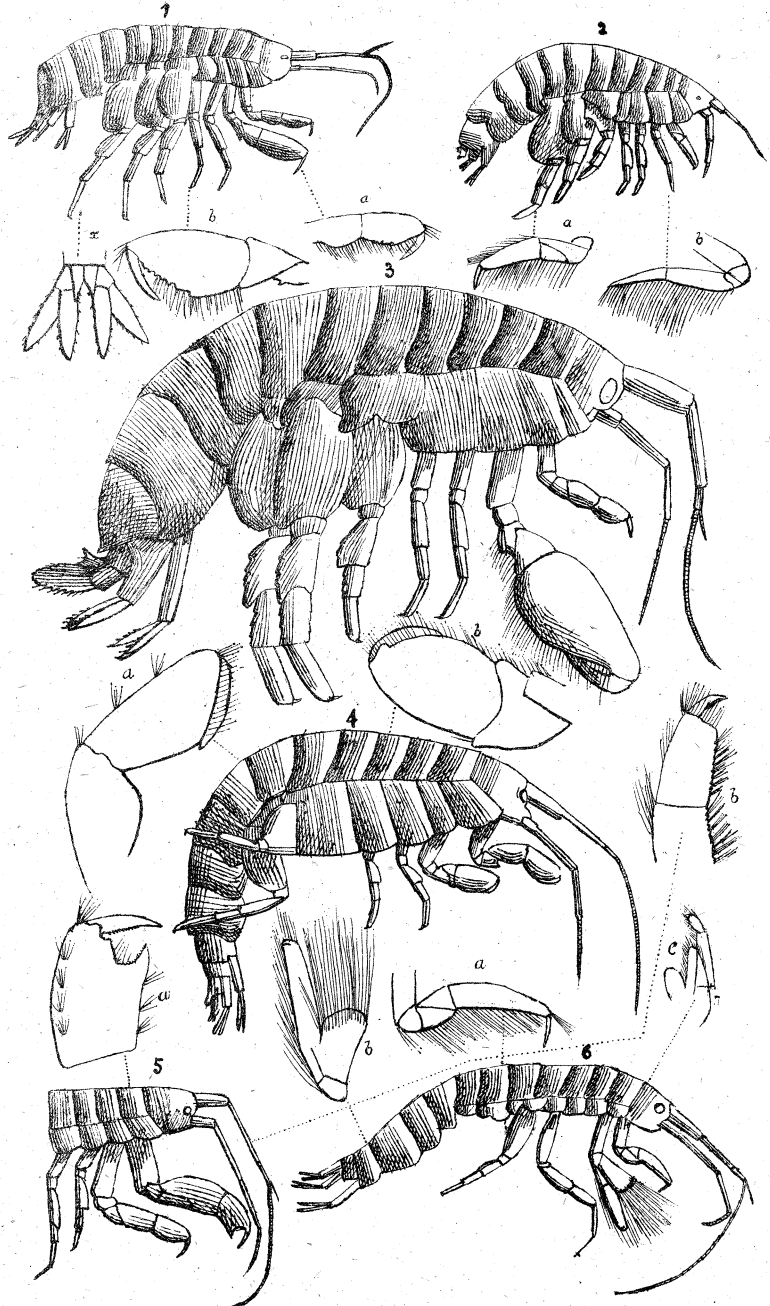
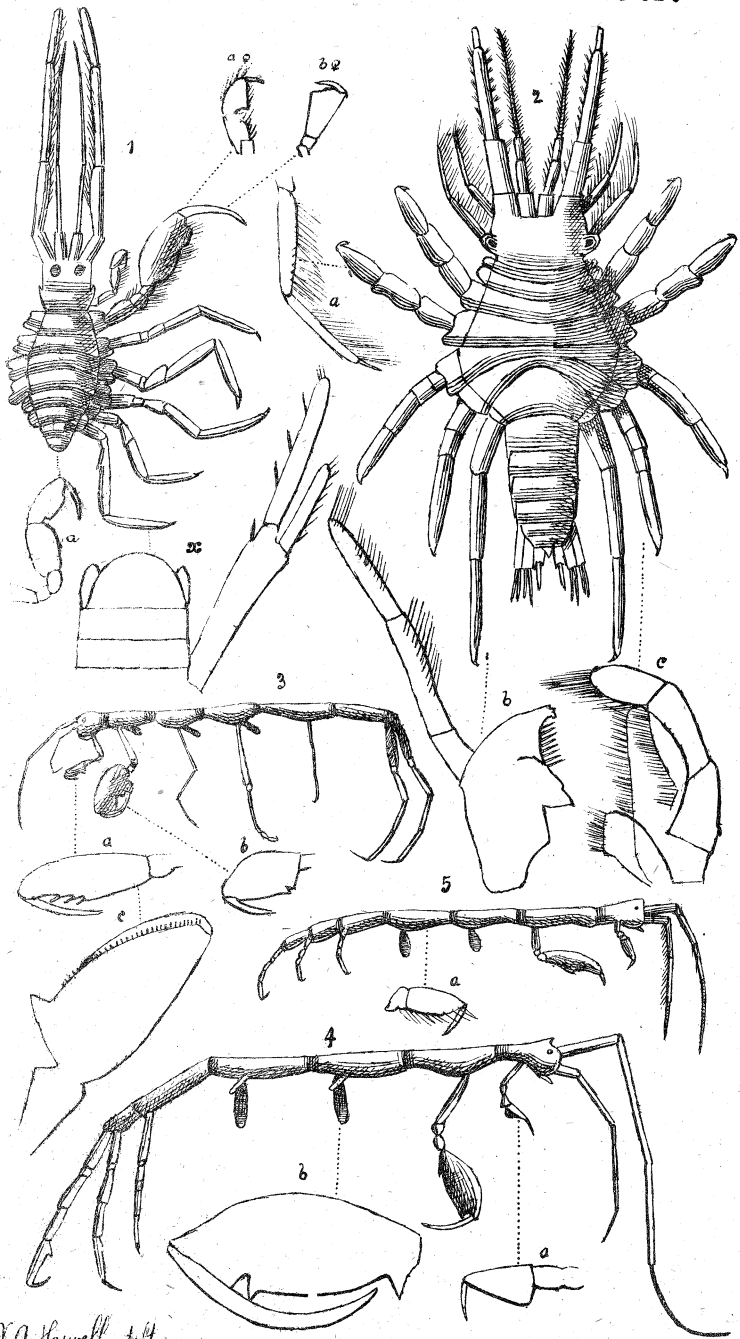


Plate II.



W. A. Haswell del.



N.A. Haswell del.