

ART. II.—*Further Additions to our Knowledge of the New Zealand Crustacea.*

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[Read before the Philosophical Institute of Canterbury, 7th September, 1882.]

Plates I.—III.

BRACHYURA.

*Hymenosoma lacustris.**Elamena* (?) *lacustris*, Chilton. (Trans. N.Z. Inst., vol. xiv., p. 172.)

THIS species was described from a single specimen, a female. I have since, through the kindness of Professor Hutton, received seven others, all males, so that I am now able to describe it more fully and to refer it to its proper genus.

In the Catalogue of the Stalk- and Sessile-eyed Crustacea of Australia Mr. Haswell has replaced the genera *Hymenicus* and *Halicarcinus* by Leach's original genus *Hymenosoma*; and my species will also come under this genus as it is defined in Mr. Haswell's catalogue. Its name will therefore be *Hymenosoma lacustris*.

Specific description:—Carapace nearly circular, rather broader than long; flat, naked, or with a few scattered hairs. Rostrum broad, strongly depressed, its upper surface concave from side to side, extremity in the form of an obtuse angle. Antero-lateral margins of the carapace with two obscure teeth. Chelæ of male small, propodos only slightly broader than the carpus, hairy. Ambulatory legs somewhat densely covered with long hairs, tarsi long, slender, compressed, densely-haired. Last pair of legs somewhat shorter than the preceding. Abdomen of male of five joints subequal in length, third rather narrower than the first and second, fourth nearly as wide as the third, last broadly rounded at the end; margin fringed with very short hairs, some longer ones being scattered on the surface. Abdomen of female with a slight median ridge along its whole length.

*Hab.* Lake Pupuke. (*Fresh water.*)

The hairs on the legs and carapace appear to be somewhat variable.

The third (external) maxillipedes are shown in pl. I., fig. 2 *a*. On them are found setæ of several kinds ranging from the ordinary plumose setæ (*c*) to others strongly serrated on each side (*b*).

This species is remarkably near *Hymenosoma australe*, Haswell, from Port Phillip. From this, however, it differs in the chelæ of the male which are small, while in *H. australe* they are "extremely large."

## ISOPODA.

Genus *Scutuloidea*, (*novum*).

Generic description:—Body not very convex. Pereion much broader than the cephalon, increasing regularly in breadth up to the fourth segment and then decreasing again.

Pleon with last segment large and triangular, emarginate at apex. Last pair of pleopoda single-branched, consisting of a single broad squamiform plate.

This genus I have made for an Isopod of which I took several specimens at Timaru, and since then at Lyttelton Harbour. It will, I think, come nearest to *Cassidina*, Milne-Edwards; however, it does not resemble *C. typa* so much as it does *C. latistylis*, Dana,\* the figure of which I have been able to see through the kindness of Professor J. von Haast. According to Mr. Miers, *C. latistylis* is the same as *C. emarginata*, Guérin-Ménév., and is found at Kerguelen's Island.†

From *Cassidina*, however, my genus differs in having the last pair of pleopoda unibranchied. In *Cassidina* the outer branch is present, but is almost rudimentary, while the inner and basal one is large and broad; so that *Cassidina* appears to be truly intermediate between *Scutuloidea* and some genus such as *Zuzara*, which has the two branches equally developed. *Scutuloidea maculata*, sp. nov. Pl. I., fig. 1.

Head moderately large, transverse, about twice as broad as long, produced obtusely between the bases of the antennæ. First thoracic leg short and stout, second long and slender, the rest more like the first though not quite so stout, all having the propodos ending in two strongly curved claws. Segments of pereion subequal in length. Pleon of two segments, last large, triangular, with a wide shallow notch at apex. Last pair of pleopoda each consisting of a single broad squamiform plate, more than twice as long as broad, narrowing posteriorly, the inner edge conterminous with the side of the last segment of the pleon, and reaching very nearly to the end of pleon.

Colour—pale yellowish-brown, whole body thickly covered with small purple spots.

Length about  $\frac{1}{8}$  of an inch.

*Hab.* Timaru, among seaweed at north side of the breakwater; Lyttelton Harbour.

Additional remarks on structure:—

The eyes are moderately large and placed wide apart at the posterolateral angles of the head.

The upper antenna (fig. 1a) is considerably shorter than the lower; the three joints of the peduncle decrease in size distally and pass insensibly into the flagellum, which consists of but few joints. On the distal portion of it "sensory setæ" are found. These at first appear to be egg-cup shaped bodies, having a stout base from which arises all round a curved portion forming the cup. But careful focussing will show that there is

\* U.S. Exploring Expedition, 1852, XIV., Crustacea, part II., 784; pl. 52, fig. 12.

† Trans. Royal Society, vol. 168 (extra volume), p. 204.

another portion stretching out of the part already described, like a greatly elongated egg; this portion is exceedingly delicate and transparent; the small dot which marks the end of it is often more easily seen than the rest. (Fig. 1*b*.)

The mandible bears a three-jointed appendage; the first and second joints being equal in length and longer than the third; the last two bearing stout setæ which increase in length as they approach the distal ends of the joints on which they are situated (fig. 1*c*).

The first maxilla consists of two nearly straight lobes, the inner one tipped with slender plumose setæ, the outer one longer and larger and bearing strong serrated setæ at the extremity (fig. 1*d*).

The second maxilla consists of three delicate overlapping plates; the two outer ones of which bear similar long simple setæ which appear to be transversely ribbed (fig. 1*f*). On the third and inner lobe are setæ, two of which bear delicate filaments near the base only; the others bearing filaments on one side only throughout the whole length of the seta (fig. 1, *e, f, g*).

The maxillipedes have the basal portion long and straight, tipped at the end with several moderately strong setæ. This basal portion bears a four-jointed appendage, the joints of which decrease in size distally; the first three have the distal end produced into a rounded lobe tipped with setæ. (Fig. 1*h*.)

The first pair of legs (fig. 1*k*) is short and stout; the meros is short and expands greatly at the distal end, carpus very short, the dactylos is large and bears at the end two claws, the terminal one larger than the other which bears a small piece projecting on its inner side (fig. 1*l*). The large claw appears to be more or less articulated to the rest of the dactylos. The second leg (fig. 1*m*) is much longer and slenderer; the basos has its inner side fringed with short setæ, the meros is longer than in the first and expands distally, the carpus is slender and as long as the propodos; the dactylos ends with two claws (fig. 1*n*), the smaller with several stiff projections along its inner edge, one towards the base of the claw being much stouter than the others. The remaining legs are somewhat like the first, though not so stout, being thus more or less intermediate in form between the first and the second.

The pleopoda or branchial plates have the basal joint broad and supporting two large branchial plates, the inner one being longer than the outer and broader at the base than at the end; both abundantly supplied with long plumose setæ (fig. 1*o*). The pleopoda all rest in a cavity formed by the excavation of the under side of the segments of the pleon, much in the same way as in *Sphæroma*.

Genus *Anthura*, Leach.

(Bate's and Westwood's Brit. Sessile-eyed Crust., vol. ii., p. 157.)

*Anthura affinis*, sp. nov. Plate I., fig 4.

Segments of pereion subequal, cylindrical. Head somewhat shorter than the first segment of pereion. Antennæ short, not quite so long as the head; upper much smaller than the lower, consisting of four joints, of which the basal one is the largest, and a very small fifth joint bearing a small pencil of setæ; lower antennæ thick and strong, basal joint large, broad, with a groove above in which the upper antenna rests, the inner edge of this basal joint is straight and in close contact with that of the antenna on other side, along the median line; basal joint followed by three subequal joints, and a short, thick, rudimentary flagellum, the joints of which bear setæ thickly set on one side.

First pair of legs very strong, not reaching beyond the head; basos very thick distally, ischios also thick and strong, meros short, carpus subtriangular, produced along the side of the propodos, and bearing setæ on its distal extremity; propodos thick, ovate, in contact with both meros and carpus, palm short with a strong projection against which the dactylos impinges; dactylos short, strong, and curved. Remaining legs all similar, not subchelate, propodos longer than the carpus and meros together. First five segments of the pleon united so closely that the lines of suture cannot be distinguished, sixth segment distinct bearing biramous appendages; outer ramus of a single joint, half as long as the inner, semicylindrical surrounding the inner ramus, its upper inner edge serrate and fringed with long setæ very delicately plumose; inner ramus of two joints equal in length and breadth, broad, edges fringed with long setæ; telson broad, round at end, with several long setæ near the centre.

Colour—pale yellow with blotches of black on the head, segments of pereion, pleon and telson. Length about  $\frac{1}{3}$  of an inch.

*Hab.* Lyttelton Harbour. Found on seaweed at low tide.

This species is a true *Anthura*, coming apparently near to *A. gracilis*, from which however it is sufficiently distinct.

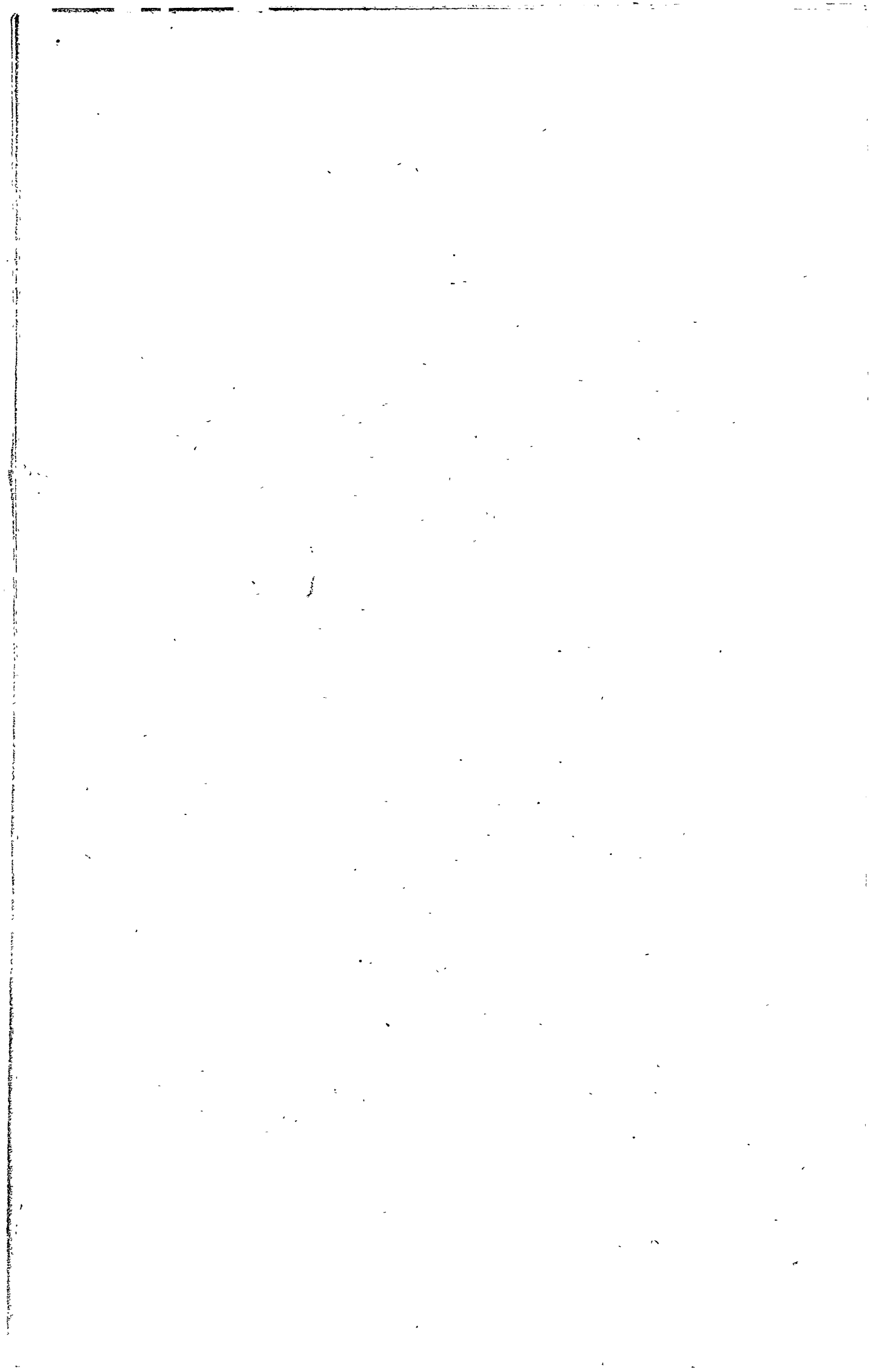
The first pair of legs only are chelate, all the rest are simple; they have the dactylos large and strong, the end forming a claw distinct from the basal portion; at the base of this claw three or four simple setæ arise laterally, and a short stout one on the inside. There is also a short stout seta on the inner distal angle of the propodos (pl. I., fig. 4 c and d).

The pleopoda are of the usual form, having a short basal joint bearing two equal oval plates with the distal margins setose. Each of these branchial plates is slightly constricted on each side, half way between the two



C.C. del.

CRUSTACEA.



ends. The first pair of pleopoda are modified so as to form an operculum covering the others; one of the plates, the outer I think, is long and broad so that it extends along the whole of the under side of the pleon; the inner plate appears to perform no special function, it is small and narrow, apparently becoming rudimentary (fig. 4 *f*). The setæ on the pleopoda are long and fringed on each side with long plumes, which are exceedingly delicate.

*Cubaris rugulosus*, Miers. (Cat. Stalk- and Sessile-eyed Crustacea of N.Z., p. 96.)

This species was described by Mr. Miers from specimens in the collections of the British Museum. His specimens appear to have been imperfect, for he neither describes nor figures the antennæ. I have found it abundantly at Eyreton, and also in the bush at Oxford. The inner antennæ are very small and composed of three joints, the basal one stout, second short and narrowing distally, third about twice as long as the second, much narrower, with a few short setæ at the end (pl. I., fig. 3 *a*). The outer antennæ consist of seven joints. The basal one is short, the second and third subequal and rather shorter than the fourth; the fifth joint is the longest, and is longer than the flagellum, which consists of two joints, the first short, very slightly longer than broad, the second more than three times as long as the first and followed by a minute terminal joint which bears two or three short setæ; the whole antenna, but more especially the distal portion, is finely hirsute, the hairs being short and delicate, much more so than can be shown in the figure (pl. I., fig. 3 *b*).

In describing the last segment of the abdomen, Mr. Miers says: "terminal segment much the broadest at the base, with the sides at first converging and then parallel." In my specimens the sides after converging usually diverge slightly.

The colour varies considerably. It is usually yellowish-brown with darker patches, but some specimens are uniformly black.

Over the whole body the integument is covered with peculiar scale-like markings, each scale being usually more or less pointed at the end (pl. I., fig. 3 *c*).

*Philongria rosea*, Koch. (Bate's and Westwood's Brit. Sessile-eyed Crust., vol. ii., p. 460.)

In a previous paper I have identified specimens found at Christchurch and Eyreton as this species, and at the same time adduced reasons for believing that it could not well have been introduced from Europe. Since then I have found specimens precisely similar in the bush at Oxford, so that I think there can be little doubt that it is really a native of New Zealand and has not been introduced.

I find that my specimens differ from those described by Messrs. Bate and Westwood in one small point, which I had previously overlooked. In theirs the upper surface of the body "is tuberculated, each tubercle emitting a minute seta at its top." In my specimens the tubercles are not very well marked, and the setæ, though certainly very small, are perhaps rather too large to be called minute, as compared with the animal itself.

I do not, however, consider this difference sufficient to warrant its removal from the European species.

Genus **Plakarthrium**, (*novum*).

Body much depressed, almost flat. Both antennæ having some of the basal joints expanded, flat; outer antenna with a flagellum. Coxæ very largely developed. Last pair of pleopoda biramous, lamellar.

*Plakarthrium typicum*, sp. nov. Plate I., fig. 5.

First two joints of inner antenna much expanded, first sub-rectangular, second sub-triangular, bearing on its posterior border the third joint, which is small and not expanded and is followed by a very small joint bearing two or three auditory cilia. Outer antenna with peduncle of five joints; the first two small and cylindrical, the third expanded, triangular, fourth expanded, transverse, fifth cylindrical, followed by a slender many-jointed flagellum reaching to the posterior border of the third thoracic segment. Eyes small, placed in the centres of the two rounded lateral portions of the head. Head transverse, about twice as broad as long, entirely enclosed by the expanded joints of the antennæ and by the coxæ of the first thoracic segment. Thoracic segments sub-equal in length, the central ones being rather broader than the first and the last. Coxæ very large, lamellar, more than half as broad as their segments; coxa of last thoracic segment reaching nearly to the extremity of the last pair of pleopoda. First two pairs of legs slender, three following pairs short and stout, last two pairs slender, similar to the first two, all ending in strong curved claws. Abdomen sub-rectangular, showing indications of three segments, the last larger than the first two together; posterior border concave. Last pair of pleopoda apparently arising right at the posterior end of the abdomen, basal joint short, flat, about as long as broad, inner branch oblong, inner margin straight, outer branch broader, expanding distally.

Colour—light-reddish brown, with a few small scattered dots of a darker brown. Length about  $\frac{1}{5}$  of an inch.

*Hab.* Lyttelton Harbour. On stems of a brown seaweed, probably *Ecklonia radiata*.

I do not know where this peculiar Isopod should be placed. In some respects it is like *Amphoroidea*, but it differs very greatly from it in others. As yet I have only found it on one kind of seaweed, probably *Ecklonia*



*radiata*. It affords a very good example of protective resemblance, for the body being very flat and of a brown colour can scarcely be distinguished from the seaweed, to which it closely adheres. It has several appliances which enable it to cling tightly to the seaweed; in the first place all the legs are furnished at the ends with powerful hooked claws, then on the under side of the basal joint of last pair of pleopoda and round the proximal edge of the outer branch are strong hooked setæ, and besides this, on the basal joints of all the legs, on some parts of the under surface of the head and in one or two other places, are small projections of the integument which may possibly be hooked setæ, though their nature is not very apparent, but which certainly appear to have the same function. They are shown on the basal joints of the legs in fig. 5 *d* and *f*.

In the mouth parts the maxillipedes appear to have the same form as in *Sphæroma*, etc., consisting of a long slender basal portion bearing an appendage of four joints, none of which is produced into a lobe at the distal end. The maxillæ I have not made out satisfactorily. The mandible is long and slender and has a sharp cutting edge of four teeth, and below two setæ with stout bases. There is no appendage unless a rounded protuberance on the mandible itself is to be regarded as such (fig. 5 *c*).

The branchial plates—pleopoda—rest in a slight hollow formed by the arching of the abdomen. There appear to be two distinct kinds, the first (fig. 5 *g*) consists of a short basal joint bearing two long subequal joints, each of which bears several long plumose setæ; in the second (fig. 5 *h*) the basal joint is about twice as broad as long, the inner branch is short and triangular, the inner edge straight and the outer one slightly curved, it has no setæ except a few exceedingly delicate ones along the inner edge; the outer branch is of the same length as the inner, and is curved so as to fit along the curved outer edge of the inner branch, it bears short plumose setæ along its outer edge, these start about half-way along the joint, and are at first very small, but gradually increase in size till the end where they are largest.

When viewed from above the last pair of pleopoda appears to be articulated on to the abdomen at its posterior edge, but when seen from below it will be found that the basal joint extends anteriorly along the under side of the abdomen, and no doubt belongs as usual to the sixth segment of pleon, which is, together with the others, completely united to the terminal one or telson.

At the end of the abdomen, in the centre, there is a small opening formed by the posterior edge of the abdomen being slightly arched and thus raised a little above the inner branch of the last pleopod; at this opening is a kind of strainer formed by setæ on the posterior edge of the abdomen and

on the inner anterior angle of the inner joint of the last pair of pleopoda. Its function, doubtless, is to admit water to the branchial plates, and at the same time to prevent the ingress of sand or other extraneous matter, the flow of water is no doubt kept up by the movement of the branchial plates themselves.

All round the outer edge of the coxæ, the expanded joints of the antennæ and the last pair of pleopoda, two distinct parallel borders are to be seen, the outer part of the integument being apparently produced beyond the inner and more opaque parts. From the inner line numerous short setæ arise, these seldom reach much beyond the outer line. (See figs. 5 a, b, k.)

Genus *Limnoria*, Leach.

(Bate's and Westwood's British Sessile-eyed Crustacea, vol. ii., p. 349.)

As this genus is new to New Zealand I quote here the generic characters.

“Oblong-ovate, depressed; antennæ subequal, cylindrical, not longer than the cephalon. Pereiopoda nearly alike, slender. Pleon six-jointed. Branchial plates naked. Terminal segment large, semicircular, with a lateral appendage on each side bearing two terminal slender styles.”

*Limnoria segnis*, sp. nov. Pl. II., fig. 1.

Body covered with short setæ. Eyes large. Neither antenna longer than head, inner one stouter and longer than the outer, consisting of three joints, of which the second is the shortest, followed by a short flagellum of about three joints bearing setæ and long simple auditory cilia. Lower (outer) antennæ of four joints, the third and fourth subequal and longer than the first and second; followed by a short flagellum of three joints bearing simple setæ. Mandible strong, appendage small, apparently of only two joints, the last tipped with a few setæ. Maxillipedes similar to those of *L. lignorum*, but having the plate at base much longer, narrower at base than towards the distal end, extremity rounded, whole margin fringed with short setæ. Terminal segment of the tail entire rounded and flattened, without central dorsal carina and with the margins not raised. Last pleopoda with the inner branch strong, about twice as long as broad, the end and outer margin supplied with setæ about as long as the joint; outer branch small pointed at the end, and with two or three setæ on the outer edge near the end.

Length— $\frac{1}{8}$  of an inch.

Colour—white, opaque.

*Hab.* On seaweed, Lyttelton Harbour.

This species is very near *Limnoria lignorum*, the dreaded “Gribble” of Europe, but it differs in several small points already mentioned. It also differs in habits; *L. lignorum* burrows into the wood of piers, piles, etc.; but *L. segnis* I found on the roots of *Macrocystis*. It is very sluggish and

does not move when taken out of the water, even if it is touched, and a good deal of extraneous matter is usually found among the short setæ which cover the body.

### AMPHIPODA.

#### Genus *Nicea*.

(Cat. Amphip. Crus. Brit. Mus., p. 51.)

*Nicea egregia*, sp. nov. Plate II., fig. 2.

*Female*.—Body much compressed dorsally; each segment of pereion raised into a crest which projects backwards over the succeeding segment; first three segments of pleon produced dorsally into crests rather more prominent than those on the segments of pereion. Crest of first segment of pleon extending along the dorsal surface of the cephalon and rising abruptly therefrom. Eye moderately large, round. Cephalon produced slightly upwards at the base of the upper antenna. Upper antenna shorter than the lower, peduncle of three joints nearly equal in length, decreasing slightly in size distally; flagellum about as long as the peduncle, each joint bearing long auditory cilia on its under side at the distal end. Peduncle of lower antenna with three joints visible, last two equal in length and considerably longer than the first, flagellum longer than the peduncle, setæ in short tufts at the end of each joint. First and second gnathopoda equal in size and similar in form; carpus long, sub-triangular, with setæ on its inner distal angle; propodos oblong not broader than carpus, palm slightly oblique, defined by a stout tooth, hairy. Coxæ about as deep as their respective segments. Pereiopoda subequal rather stout; meros expanded distally and produced anteriorly in the first two, posteriorly in the last three pereiopoda, each pereiopod with dactylos long strong and curved with a short seta arising on the inner margin towards the end. All the pereiopoda nearly free from setæ. Of the last three pairs of pleopoda, the first two reach to the same point slightly beyond the extremity of the body; the rami are about equal in length to the peduncles, and are provided with short strong teeth at the extremity and on their upper margins. Last pair of pleopoda apparently rudimentary, consisting of two joints rounded and perfectly free from setæ. Telson concave below, subrectangular, about as broad as long, rounded posteriorly, cleft about half-way down.

*Male*.—Differs in having the crests on segments of pereion not so prominent; first segment not produced so much along the head; *second gnathopod when fully developed chelate*, basos long and narrow, ischios and meros short, carpus apparently united with propodos, which is large and produced distally into a fixed finger against which the dactylos impinges, dactylos strong, rather blunt at end; the ends of both fingers setose. The first pair of gnathopoda same as those of female.

Colour—various, greater part of body usually tinged with red but sometimes with blue, integument thick and more or less opaque.

Length about  $\frac{1}{4}$  inch.

*Hab.* Lyttelton Harbour. On seaweed, usually at roots of *Macrocystis*.

This species is very peculiar in appearance and presents several points of interest.

The maxillipedes are shown in Pl. II., fig. 2*d*. Both the basos and ischios bear plates, that of the former ending in two rounded teeth, that of the latter rounded at the end and with its inner edge setose, the meros has its distal portion produced externally in a rounded lobe past the extremity of the carpus, the propodos has its distal and inner margins setose, the setæ on the inner margin being minutely serrate; the dactylos is broad, subtriangular, and nearly free from setæ.

The peculiar chelate character of the second pair of gnathopoda of male appears to be acquired only in fully-developed individuals; in smaller specimens they are subchelate, with the palm transverse, as shown in fig. 2*g*; intermediate forms between this and the fully-developed form shown in fig. 2*f* are also found. At first sight the carpus appears to be absent; I believe that it is joined on to the propodos, but the evidence of this is not quite satisfactory. The sixth segment of the pleon appears to be absent, unless the part that I have described as the basal portion of the last pair of pleopoda represents the sixth segment itself; if this be the case, the last pleopod will be represented only by a single rounded joint; in either case it certainly bears the appearance of being rudimentary and useless.

#### Genus *Montaguana*.

(*Montagua*, Spence Bate, Cat. Amphip. Crust. Brit. Mus., p. 54.)

As the name *Montagua* was long ago used by Fleming for a genus of Nudibranch Mollusca, I have altered the name of Mr. Spence Bate's genus to *Montaguana*.

Generic characters:—"The superior antennæ are as long as the inferior, and not furnished with a secondary appendage. The mandibles are not furnished with an appendage. The maxillipedes are pediform, unguiculate, and without, or with only rudimentary, squamiform plates. The first pair of gnathopoda are small, subchelate, the coxæ not developed into a squamiform plate. The second pair of gnathopoda are larger than the first, and have the coxæ very large, squamiform, deeper than the body, and produced anteriorly, so as to cover the organs of the mouth; the propodos is developed upon the same type as in the first pair. The pereopoda are subequal; the coxæ of the two anterior pairs are very largely developed,

deeper than the body, and produced posteriorly, so as to cover that of the following pair of pereopoda. The posterior pair of pleopoda are styliform, unbranched, the ramus biarticulate. The telson is simple and squamiform."

*Montaguana miersii?*

(? *Montaguana miersii*, Haswell, Proceedings Linn. Soc. N.S.W., vol. iv., p. 323, pl. XXIV., fig. 4, and Cat. Australian Crust., p. 226.)

"Coxæ of the posterior gnathopoda and the two first pairs of pereopoda much deeper than their respective segments. Superior and inferior antennæ subequal in length, equal in length to the cephalon and first three segments of the pereion; the peduncles stout, rather shorter than the flagella. Anterior gnathopoda small, the propodos subquadrate, the palm nearly transverse. Posterior gnathopoda with the propodos large, cordiform; the palm oblique, undefined. Pereiopoda subequal, rather stout. Colour yellow with brown markings. Length about  $\frac{3}{20}$  in."

*Hab.* Timaru and Lyttelton Harbour.

Mr. Haswell obtained his specimens at Port Jackson. Mine differ from the description and figures given by him in some small points so that I am rather doubtful whether they are really the same species or not.

The first pair of gnathopoda has the palm more oblique than shown in Mr. Haswell's figure. In the second gnathopoda the specimens obtained at Timaru differ somewhat from those obtained at Lyttelton, though much too close in other respects to be considered as distinct species. The Lyttelton specimens are nearest to those described by Mr. Haswell. The palm, though it can hardly be called defined, yet has two stout setæ at the place where the end of the finger reaches to, one on each side; on the under-side of the propodos towards the base are a few rather long setæ, not shown in Mr. Haswell's figure; and in the centre of the palm is a small sharp projection. In the Timaru specimens the propodos is much stouter, palm less oblique, and without the small projection at its centre.

In the last three pairs of pleopoda my specimens closely resemble those of *M. longicornis* as figured by Mr. Haswell. In the figure of *M. miersii* the last pair of pleopoda are drawn with two rami, but this must, I suppose, be a slip of the artist's.

Genus **Cyproidia**, *Haswell*.

(Proc. Linn. Soc. N.S.W., vol. iv., p. 320, and Cat. Aust. Crust., p. 229.)

"Body broad. Pereion and pleon of equal length. Coxæ of gnathopoda very small. Coxæ of the first and second pairs of pereopoda enormously developed, and cemented together to form broad and deep lateral shields, concealing almost entirely the gnathopoda and pereopoda, and extending forwards to the sides of the cephalon, and backwards as far as

the posterior border of the sixth segment of the pereion, excavated posteriorly for the shallow coxæ of the third pereopoda. Coxæ of last two pairs of pereopoda very small. Antennæ subequal superior without an appendage. Mandibles with a palp. Maxillipedes unguiculate; both basos and ischium armed with small squamiform plates. Gnathopoda subcheliform. Pereiopoda slender. Posterior pleopoda biramous. Telson single."

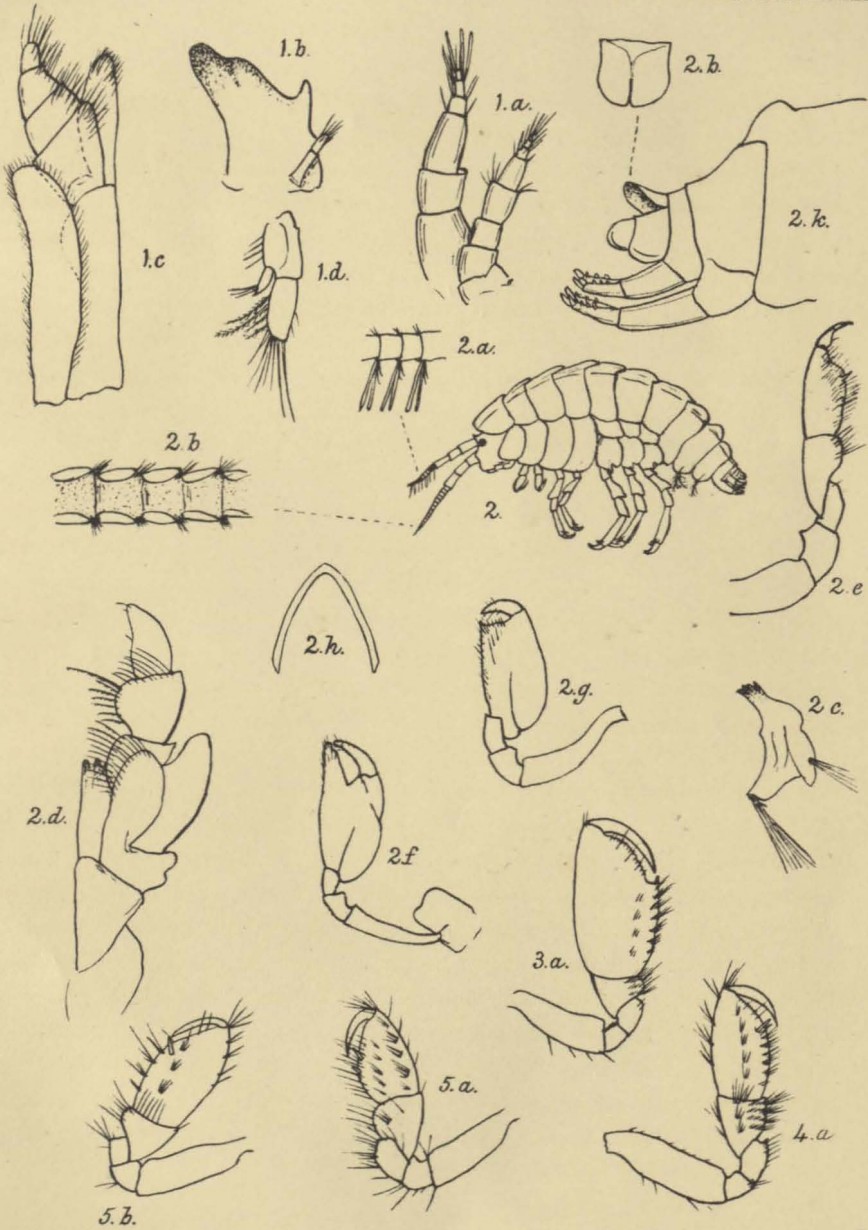
*Cyproidia* (?) *crassa*, sp. nov. Pl. III., fig. 1.

Eyes large. All the mouth parts and nearly all the lower antennæ concealed by the coxæ of the two pairs of gnathopoda and the first pair of pereopoda. Coxæ of first pair of gnathopoda triangular about as deep as its segment, extending anteriorly over the mouth parts, posterior edge slightly curved. Coxæ of second gnathopod and first pereopod deeper than their segments, rather narrow, slightly curved. Coxæ of second pair of pereopoda enormously developed, much deeper than its segment and extending posteriorly as far as the posterior border of the seventh segment of pereion, excavated above, posteriorly for the shallow coxa of the third pereopod. Coxæ of last two pairs of pereopoda rudimentary, hidden. The coxæ of the two gnathopoda and the first two pereopoda united together to form deep broad lateral shields which enclose all but the ends of the pereopoda. Upper antennæ with first two joints of peduncle stout, subequal, the second produced above into a strong tooth, third joint small and indistinguishable from the flagellum; flagellum nearly as long as peduncle bearing on its under surface long auditory cilia. First joint of peduncle of lower antennæ large, second joint shorter, articulated to the first by a geniculate joint, third joint longer than second but not quite so long as the first followed by a short flagellum about as long as the third joint of peduncle. Two pairs of gnathopoda equal in size and similar in shape, meros and carpus both having the inner distal angle produced into a lobe setose at the end, propodos rather small, hairy, some of the hairs on the palm strong, plumose at tip, dactylos rather small, slightly curved at the tip; the gnathopod appears to be but very imperfectly subchelate. Pereiopoda subequal, setæ few, short. Of the last three pairs of pleopoda the first is the longest, peduncle rather slender, rami slender, lanceolate, nearly equal, almost naked, second similar but with rami more unequal, last stouter, rami unequal, naked. Telson oval, slightly narrower towards the end than at base, margins entire, no setæ. Colour—brown.

Length, about  $\frac{1}{7}$  inch.

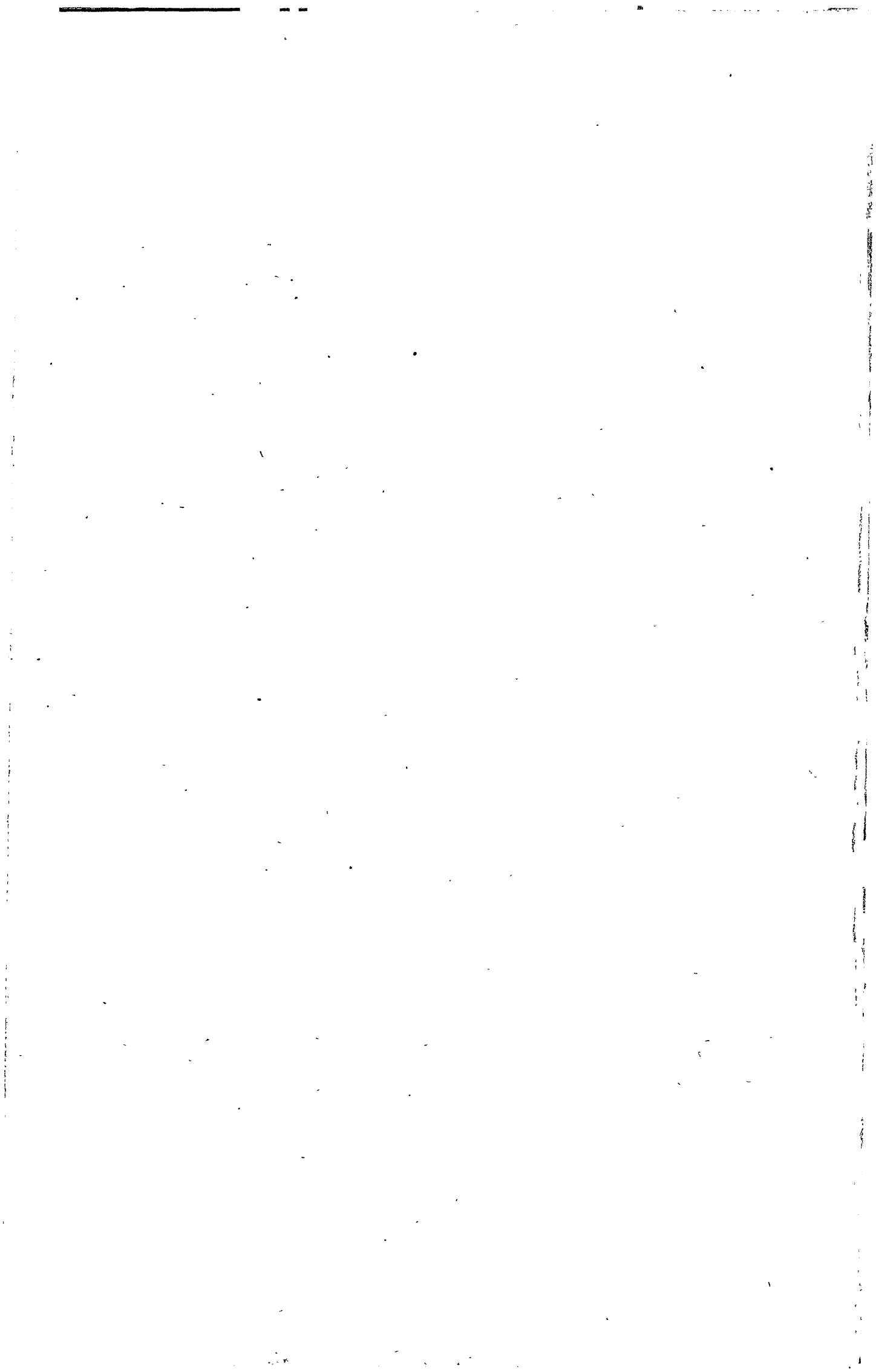
*Hab.* Lyttelton harbour.

As will be seen from the figure and the description already given, this species differs very considerably in the form of the coxæ from Mr. Haswell's species for which he made the genus; it will most probably form the type



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of a new genus, but, as I have only had two specimens, both of the same species, I prefer to leave it under Mr. Haswell's genus for the present. The details (fig. 1 *a-d*) were taken from a small specimen, and hence may not represent quite accurately their form in more adult specimens.

Genus **Moera**, *Leach*.

(Cat. Amphip. Crust. Brit. Mus., p. 187.)

*Moera spinosa*, Haswell. (Proc. Linn. Soc. N.S.W., iv., p. 268, pl. x., fig. 5; and Cat. Aust. Crust., p. 257.)

“Posterior margin of the five anterior segments of the pleon armed with a few acute teeth or spines; fourth and fifth segments armed behind with acute 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 peduncle as long as the cephalon and 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 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 8 lines.”

*Hab.* Auckland.

Of this species I have two specimens, a male and a female, for which I have to thank Professor Hutton. He found them in a collection of Mollusca sent him from Auckland. Mr. Haswell's specimens were from Tasmania. In my specimen of the male the second gnathopod of the right side only has the two prominent teeth on the palm, and these are rather larger and more blunt at the end than those shown in Mr. Haswell's figure; the second gnathopod of the left side is like those of the female, having the palm slightly convex, and without the two teeth. (See plate II., fig. 3*a*.)

\* In the Catalogue this is by an error printed “appendage nearly as long as the flagellum.”

*Moera petriei*, G. M. Thomson. (Trans. N.Z. Inst., xiv., p. 236, pl. xviii., fig. 3).

This species was described by Mr. Thomson from specimens obtained at Port Pegasus in the dredge. I have found it pretty abundantly in Lyttelton Harbour at low tide. The female differs from the male in the form of the second pair of gnathopoda. In these the carpus is much longer than in the male, being slightly longer than broad; it is densely haired, the hairs being chiefly arranged in rows; many if not all these hairs are serrated; the propodos is only very slightly broader than the carpus, having tufts of setæ along both sides and also along the middle, those on the under surface being the most numerous and the thickest. Palm imperfectly defined by several strong setæ at the point where the tip of the dactylos impinges. Dactylos slender, very acute. (See plate II., fig. 4a.)

In the male my specimens have the propodos of the gnathopoda less hairy than the one drawn by Mr. Thomson, and the dactylos is more blunt, being quite rounded at the end.

The two acute spines on the postero-dorsal margin of the fourth segment of the pleon are invariable in both sexes.

Genus *Harmonia*, Haswell.

(Proc. Linn. Soc. N.S.W., vol. iv., p. 330, and Cat. Aust. Crust., p. 250.)

Generic characters:—"Coxæ not so deep as their respective segments. Superior antennæ with an appendage. Inferior antennæ longer than the superior pair. Mandibles with a palp. Maxillipedes unguiculate, subpediform, provided with a squamiform plate on the basos only. Gnathopoda subchelate, unequal, posterior pair very large. Pereiopoda stout. Posterior pleopoda biramous, the rami short, conical. Telson single, elongate."

Of this genus Mr. Haswell says: "This genus, of which I have as yet observed but one species, has affinities with *Eurystheus* and *Amathia*, but is distinguished from the former by the form of the telson and the stoutness of the pereiopoda, and from the latter mainly by the large size of the posterior gnathopoda."

Before noticing Mr. Haswell's genus I had found the following species, and had begun to describe it as a new species of *Eurystheus*.

*Harmonia crassipes*, Haswell. (l.c., p. 330, pl. xix., fig. 3.)

"Superior antennæ as long as the cephalon and first six segments of the pereion, first and second segments of the peduncle subequal, the second narrower than the first, third scarcely distinguishable from the articuli of the flagellum; flagellum rather longer than the peduncle. Inferior antennæ longer than the superior pair; peduncle and flagellum subequal. Anterior gnathopoda small; propodos ovoid; palm oblique, undefined. Posterior gnathopoda much larger than the anterior pair; carpus sub-

triangular; propodos irregularly ovoid, palm oblique, excavate, defined by a triangular tooth, and armed with another of similar form near the distal end. Two anterior pairs of pereopoda subequal; three posterior pairs with the basa oblong twice as long as broad, the other joints very broad, the dactylos very stout; fourth pair smaller than the fifth and sixth. Rami of fourth pair of pleopoda as long as the protopodite; those of the fifth pair shorter; those of sixth pair very short, conical, armed with a few straight setæ. Telson simple, conical, compressed. Colour brown. Length,  $\frac{3}{20}$  inch."

*Hab.* Lyttelton Harbour; Timaru.

This species is moderately common at Lyttelton Harbour; Mr. Haswell's specimens are from Port Jackson. The female differs from the male in the form of the second gnathopoda. The first gnathopoda are like those of male, and are shown in pl. II., fig. 5 *a*. They are very hairy, and at the inferior edge of the palm are two stout setæ. The second gnathopoda of female are much smaller than those of the male, the carpus is subtriangular and larger than the carpus in the second gnathopoda of male, it has its distal and inferior borders setose; propodos only slightly broader than the carpus, long ovate, with small tufts of setæ on the two sides and on the middle, palm oblique imperfectly defined by a stout seta on each side at the end of the dactylos.

#### Genus **Moera**.

*Moera incerta*, sp. nov. Pl. III., fig. 3.

None of the segments of pleon or pereion produced into teeth. Coxæ shallower than their respective segments. Basal joint of upper antenna stout, narrowing distally, second joint only slightly longer than the first, third joint short; flagellum shorter than peduncle, about as long as the basal joint and half the second; secondary appendage rather more than half as long as the flagellum; setæ on the antenna short and very fine. Lower antenna shorter than the upper, slender; peduncle as long as that of upper antenna, last joint of peduncle slightly shorter than the preceding joint, flagellum short, not quite so long as the last joint of the peduncle, setæ short and delicate. First pair of gnathopoda having the carpus about as large as the propodos; its outer edge with a shallow notch towards the distal end, inner edge densely fringed with setæ, small tufts of setæ scattered over the joint; propodos ovate, not very hairy, palm slightly convex, fringed with short setæ, imperfectly defined by one or two stout short setæ; dactylos slender acute, with one or two long setæ at its base. Second pair of gnathopoda very large, carpus rather small subtriangular, propodos very large, subrectangular, slightly narrowed at the base, inner margin slightly sinuous, with a few small tufts of setæ

chiefly on the proximal half; on the outer margin mostly towards the distal part are also a few small tufts of setæ, but these lie close along the joint and are very easily overlooked. Palm transverse defined by a short stout tooth and having short stout setæ along the whole palm. Dactylos thick and strong, not longer than palm. First two pairs of pereopoda subequal, rather slender, last three broad, increasing slightly in size posteriorly, basos moderately large subrectangular, anterior edge with a few small setæ, posterior edge minutely serrate, a very minute seta arising at each serration, meros broad serrated, with moderately long strong setæ, carpus expanding somewhat distally, setose; propodos setose on anterior side only, numerous strong setæ arising at the base of the dactylos; dactylos considerably narrower than propodos, ending in two sharp points, the principal one longer and more curved than the other. Inferior edges of first three segments of pleon supplied with several small setæ. Posterior pair of pleopoda only reaching very slightly beyond the two preceding pairs, of which the first pair is slender, having the peduncle considerably longer than the rami, rami with long strong setæ at their extremities; second pair stouter, rami with similar long strong setæ at end; third pair having the rami broad and setose more especially on the outer edge. Telson double, each half concave posteriorly with two long setæ arising from the hollow, and having another hollow on the outer side towards the distal end with a single seta springing from the hollow.

Length, about  $\frac{1}{5}$  of an inch.

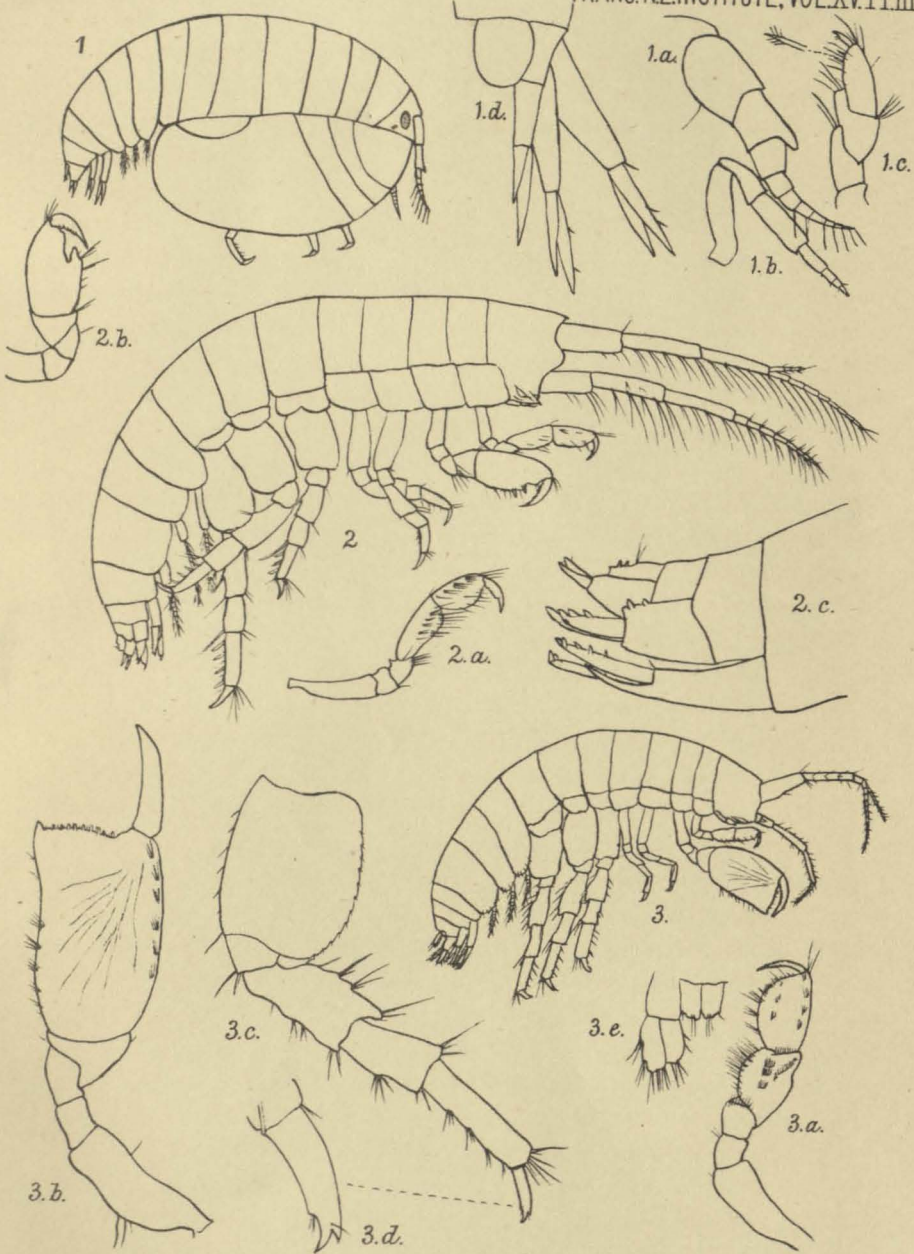
*Hab.* Lyttelton Harbour.

This species is very close to *M. quadrimanus*, Dana, *M. grossimanus*, Montagu, *M. viridis*, Haswell, *M. truncatipes*, Spinola, but differs from all in the form of the second pair of gnathopoda. In this respect it closely resembles *M. blanchardi*, Spence Bate, but differs in having the basa of the three posterior pairs of pereopoda dilated, in having the secondary appendage of upper antenna not so long as the primary flagellum, and in other points. It also resembles *M. tenella*, Dana, but that species has the base joint of upper antenna "not stout, second very long;" the two species also appear to differ somewhat in the form of the second gnathopoda, and also in the length of the posterior pair of pleopoda.

Genus **Podocerus**, *Leach*.

(*Cat. Amphip. Crust. Brit. Mus.*, p. 252.)

"Eyes small, situated on a lobe between the superior and inferior antennæ. Superior antennæ having a secondary appendage, which is generally very minute. Inferior antennæ robust, the flagellum consisting of but few articuli and as stout as the peduncle, the hairs towards the extremity being developed into spines, which increase in strength as they



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approach the apex, where they become curved. Second pair of gnathopoda having the propodos (in the male) much larger than that of the first pair. Two anterior pairs of pereopoda short, having the basa very broad. Posterior pair of pleopoda having two rami, one of which is armed with one or more hooked spines. Telson squamiform."

*Podocerus frequens*, sp. nov. Plate III., fig. 2.

Eye moderately large round. Superior antenna as long as the inferior; first joint of peduncle stout, next two joints longer, equal in length, slender, flagellum considerably longer than the last joint of peduncle, secondary appendage of two or three joints; the whole of the inferior margin of antenna thickly fringed with long setæ. Inferior antennæ slender, last two joints of flagellum equal and longer than the preceding one, flagellum considerably longer than the last joint of the peduncle, inferior border of antenna fringed with long setæ; spines on flagellum even at the end are not much curved and not very strong. First pair of gnathopoda long but not very stout, carpus longer than propodos, hairy; propodos ovate hairy, dactylos with proximal half of inner edge serrate, distal half smooth. Second gnathopod with carpus short, triangular, propodos large, produced inferiorly into a strong tooth against which the dactylos impinges, dactylos strong proximal half of inner edge serrated. First two pairs of pereopoda subequal, stout. Last three pairs stout, third smaller than the fourth and fifth. Last three pairs of pleopoda short all reaching to the same point; first pair the longest, rather slender, peduncle longer than the rami and produced between them into a sharp slightly curved spine which is about two-thirds as long as the rami; rami with short teeth on upper margins curving upwards; second pair with stout peduncle, rami more slender than peduncle, curved teeth on upper margins of peduncle and rami; last pair with stout peduncle narrowing at apex, rami small slender, nearly naked. Telson with two curved spines, and anterior to these one or two simple setæ.

*Female*.—Differs from above in having the propodos of second gnathopoda less stout and wanting the strong process, but with two stout setæ towards the end of the palm.

Length about  $\frac{1}{10}$  of an inch.

*Hab.* Lyttelton Harbour.

This species appears closely to resemble *P. validus*, Dana, from Rio Janeiro, but that species has the inferior antennæ "very stout."

The process on the propodos of second gnathopoda of male varies in size in different specimens, and is often longer and more distinct than shown in fig. 2b.

## EXPLANATION OF PLATES I.—III.

## PLATE I.

- Fig. 1. *Scutuloides maculata*  $\times 12$ ; *a*, inner antenna  $\times 40$ ; *b*, auditory seta from same, more highly magnified; *c*, mandible  $\times 40$ ; *d*, first maxilla  $\times 40$ ; *e*, second maxilla  $\times 74$ ; *f*, seta from outer lobe of same highly magnified; *g*, inner lobe of same  $\times 160$ ; *h*, maxillipede  $\times 40$ ; *k*, first thoracic leg  $\times 15$ ; *l*, end of same  $\times 40$ ; *m*, second thoracic leg  $\times 15$ ; *n*, end of same  $\times 40$ ; *o*, one of the pleopoda  $\times 30$ ; *p*, abdomen from below  $\times 12$ .
- Fig. 2. *Hymenosoma lacustris*; *a*, third (external) maxillipede  $\times 10$ ; *b* and *c*, different forms of setæ from the same, more highly magnified; *d*, chela of male  $\times 8$ ; *e*, abdomen of male  $\times 15$ .
- Fig. 3. *Cubaris rugulosus*; *a*, inner antenna  $\times 40$ ; *b*, outer antenna  $\times 10$ ; *c*, scale-like markings on the integument  $\times 120$ .
- Fig. 4. *Anthura affinis*; *a*, antennæ from above  $\times 23$ ; *b*, first thoracic leg  $\times 15$ ; *c*, second thoracic leg  $\times 13$ ; *d*, extremity of same, more highly magnified; *e*, abdomen, with telson and last pair of pleopoda, from above,  $\times 30$ ; *f*, first pleopod  $\times 30$ .
- Fig. 5. *Plakarthrium typicum*  $\times 12$ ; *a*, inner antenna  $\times 18$ ; *b*, outer antenna  $\times 18$ ; *c*, mandible  $\times 120$ ; *d*, first thoracic leg  $\times 18$ ; *e*, extremity of same  $\times 75$ ; *f*, third thoracic leg  $\times 40$ ; *g*, one of the pleopoda  $\times 30$ ; *h*, another form of the pleopoda  $\times 30$ ; *k*, last pair of pleopoda  $\times 24$ .

## PLATE II.

- Fig. 1. *Limnoria segnis*; *a*, antennæ from above  $\times 60$ ; *b*, mandible  $\times 120$ ; *c*, maxillipede  $\times 120$ ; *d*, appendage of sixth segment of pleon  $\times 40$ .
- Fig. 2. *Nicea egregia*, female  $\times 6$ ; *a*, portion of flagellum of upper antennæ with auditory cilia  $\times 40$ ; *b*, portion of flagellum of lower antenna  $\times 60$ ; *c*, mandible  $\times 40$ ; *d*, maxillipede  $\times 60$ ; *e*, first gnathopod  $\times 30$ ; *f*, second gnathopod of fully developed male  $\times 13$ ; *g*, second gnathopod of young male  $\times 13$ ; *h*, transverse section through one of the segments of pereion of male  $\times 15$ ; *k*, extremity of pleon  $\times 30$ ; *l*, telson, from above  $\times 40$ .
- Fig. 3. *Moera spinosa*; *a*, second gnathopod of female, which is the same as second gnathopod of left side of male  $\times 13$ .
- Fig. 4. *Moera petriei*; *a*, second gnathopod of female  $\times 13$ .
- Fig. 5. *Harmonia crassipes*; *a*, first gnathopod of female  $\times 35$ ; *b*, second gnathopod of female  $\times 35$ .

## PLATE III.

- Fig. 1. *Cyproïdia* (?) *crassa*  $\times 30$ ; *a*, upper antenna, and *b*, lower antenna, in position,  $\times 70$ ; *c*, first gnathopod  $\times 70$ ; *d*, telson and three posterior pleopoda from above  $\times 120$ .
- Fig. 2. *Podocerus frequens*  $\times 30$ ; *a*, first gnathopod  $\times 40$ ; *b*, second gnathopod of male  $\times 30$ ; *c*, extremity of pleon  $\times 70$ .
- Fig. 3. *Moera incerta*  $\times 13$ ; *a*, first gnathopod  $\times 30$ ; *b*, second gnathopod  $\times 30$ ; *c*, fifth pereopod  $\times 30$ ; *d*, dactylos of same  $\times 120$ ; *e*, telson and last pair of pleopoda from above  $\times 30$ .