Contributions for a Revision of the Crustacea Brachyura of New Zealand.


[Read before the Philosophical Institute of Canterbury, 7th November, 1928; received by the Editor, 5th December, 1928; issued separately, 25th March, 1929.]

The authors of this paper intended to prepare a comprehensive monograph on the New Zealand Brachyura, but a severe limitation of the time available for the work has made it necessary for the results of the study to be presented in a much more fragmentary form. This will explain the unequal attention that has been paid to the various species, some of which have been studied in considerable detail, while others have been left aside altogether. We trust, however, that the present contributions will facilitate the study of collections in local museums and elsewhere, for such work would readily provide valuable data concerning several pressing problems and gaps in our knowledge.

One of these problems concerns the many species whose occurrence in the New Zealand Region is doubtful. Certain species are definitely known to have been wrongly recorded as coming from New Zealand waters, and others are under suspicion; but it is difficult to demonstrate that a given species is not a member of the fauna, and a premature dismissal is liable to add to the difficulties and to lead to undesirable complications when such a species is subsequently found. For these reasons we have not indulged in such a wholesale purging of the list as would have been necessary in the more complete monograph which we originally intended to write.

The material before us consists of some 330 jars and tubes of New Zealand Brachyura, in addition to a representative dried collection and miscellaneous foreign specimens. Some of the material has already been reported upon by the senior author, particularly those of the expeditions to the Subantarctic Islands, to the Kermadecs, and along the east coast in the "Nora Niven"; the interesting freshwater Hyphnomosoma has been the subject of several memoirs; and MS. notes have been drawn up from the collections secured by the senior author for many years from all parts of New Zealand—partly from correspondents, and partly from personal collecting, especially during a cruise in the Government steamer "Hinemoa" in 1914-1915, during the visit to New Zealand of Dr. Th. Mortensen, Zoologist of the Copenhagen Museum. The junior author has also personally col-

*The compilation of this paper is almost entirely the work of Mr. E. W. Bennett, the "junior author." Owing to his appointment to a position in the Zoological Department of the University of Western Australia, Perth, it had to be completed in a very limited time and there has been little opportunity of discussing with him many of the points under consideration.

—CHAS. CHILTON.
lected Brachyura for several years, particularly from the east coast of the South Island. The rest of the material consists of the collections of the Canterbury Museum, including amongst other miscellaneous material a set of dried exhibit specimens named by Hutton. The whole of our collections, including some type specimens, has now been deposited in the Canterbury Museum.

It will be seen that the material available includes collections from all parts of the New Zealand region except the Kermadec Islands,* and contains dredged as well as intertidal specimens. It is therefore fairly representative of the New Zealand Brachyurous fauna. But no collection is ever sufficiently complete, and we have, for example, not felt justified in excluding the doubtful species from the list because they are not represented in our collections. A comparison of our findings on such genera as, for example, *Cyclograpsus* and *Helice* will show the necessity for cautiousness in this direction; but the doubtful species in Hutton’s ‘‘black list’’ (see below) may be regarded as having been given their last chance in the present paper; and if they are not recognised in the other collections in the country, particularly those from deeper water and less familiar districts, they may henceforth be rejected without compunction.

A brief survey of previous work will serve to illustrate not only the progress of our knowledge, but also the reasons for the doubt that exists concerning so many species. Among the earliest writers who contributed reports on Brachyura, including those of New Zealand, are Milne-Edwards, who described the collections of Quoy and Gaimard; Dana, who accompanied the United States Exploring Expedition; Jacquinot and Lucas, who described the Brachyura of the so-called “Voyage au Pôle Sud”; and Heller, the naturalist of the “Novara” expedition. These reports, written for old-world carcinologists rather than for New Zealand workers, were additions to the European literature rather than monographs on the New Zealand crab-fauna, and local workers were greatly aided by the publication in 1876 of Miers’ *Catalogue of the New Zealand Crustacea.* This is the only attempt that has yet been made to gather together what is known of the New Zealand Brachyura, or of the local Crustacea in general. It contained definitions of all the species, genera, and higher groups known or thought to occur in this country; and it added a number of species to the list, including some which were new to science—the latter being first described in the *Ann. Mag. Nat. Hist.*, ser. 4, vol. 17, 1876, and figured in the Catalogue. The absence of figures of previously-known species detracted from the completeness of the work to some extent, but a much more serious defect was the inclusion of a number of species which do not occur in our waters. The latter was no fault of Miers, who (as Hutton remarked) had to record all the species reported to have come from New Zealand; but the fault lay with those who had mixed the labels in so many cases, and who had previously published incorrect records. The worst offender in the latter respect was Heller, whose locality-records are unreliable.

This source of confusion was not expressly dealt with by Filhol in his report on the *Mission de l’Ile Campbell,* but this author based

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*The Brachyura of the Kermadec Islands have not been included as they are Australian rather than New Zealand.
his work on excellent material and so did not add to the confusion, though he listed all the species in the Catalogue without criticism. Filhol's material consisted of his personal collections and of a few specimens presented by local naturalists, and of those in the Paris Museum which had already been described by Milne-Edwards. A fine atlas of plates went far towards remedying what was felt to be a drawback in Miers' Catalogue.

A further source of confusion, too obvious to cause much real difficulty, has been the tendency of a few writers to identify our species with those of Europe, depending on the briefest descriptions.

In a short paper published in 1882 in the N.Z. Journal of Science, p. 263, Hutton drew attention to the unreliable nature of many of these records. He gave a list of species which should certainly be excluded, another of species which should probably also be excluded, and a third list of those whose occurrence in this country had not been verified. These conclusions were corroborated in a brief note published in the same volume by the Hon. G. M. Thomson (i.e., p. 333), who has paid much attention to these Crustacea. In the report on the Crustacea collected during the expedition of H.M.S. "Alert", Miers repeated several of these records, but was evidently unaware of the criticism of his Catalogue by local workers. These records have also been repeated by Ortmann (1894) and several other workers abroad. A few of the species which Hutton regarded as doubtful have been found again, but his list appears to have been remarkably well chosen; in very few cases, for example, does the list drawn up by G. M. Thomson and C. Chilton for the Index Faunae Novae Zealandiae, published many years later, differ from these earlier views. In the list below we have not included the species which Hutton and Thomson wished to exclude, except where there is further evidence; but we have retained most of the doubtful ones as still doubtful. In the synonymy of the various species we have not quoted the Index Faunae N.Z. and Hutton's critical lists, but when they contain an opinion which is still of weight we have drawn attention to them in our notes.

It need hardly be stated that the "Challenger" reports contain a valuable addition to our knowledge. The collections of Brachyura were entrusted to Miers, whose previous knowledge of our Brachyuran fauna was of some advantage; nevertheless, as only a few Crustacea were collected in New Zealand the report was hardly of such outstanding importance to New Zealand workers as the reports on other groups of animals less confined to the littoral. Subsequent descriptive work has been confined almost entirely to the writings of the senior author, as mentioned above; but special mention should be made of a paper on the "Biology of Otago Harbour" by the Hon. G. M. Thomson (Trans. N.Z. Inst., vol. 45), who has devoted a section of the paper to notes on the occurrence and habits of the Brachyura of the coasts of Otago.

In the present survey, our aim has been to state the problems rather than to attempt to solve them. In no case has a decision been given without a full statement of the grounds on which it is based, and the extent to which, in our opinion, it may be relied upon. The way is thus left clear for further revision. Certain genera have not
been touched upon, namely, *Paramithrax*, of which the Canterbury Museum contains an extensive series; *Pilumnus*, a difficult genus of which the collections contain some forms new to science or at least to New Zealand; and the smaller crabs of the genera *Pinnothereis*, *Halicarcinus*, *Hymenicus*, *Hymenosoma*, *Elamina*, and *Ebalia*.

The Canterbury Museum library contains some papers formerly belonging to Hutton, and annotated by him; most of his comments have already been published in the critical paper mentioned above, but we have quoted and duly acknowledged several others below. It may be noted that in his copy of his critical paper, he has corrected the word "typical" (p. 264, line 9) to "tropical," which was the word originally intended.

In our lists of localities below, it is to be understood that some of the personal names after the records refer to collectors whose specimens we have seen and identified, and some to authors from whom the record is quoted; the latter is the case when the author in question has contributed a paper which is quoted in the synonymy of the species in question. When it is not expressly stated that records on the authority of Hutton are based on his MSS., it is to be understood that he has left labelled specimens in the Canterbury Museum. Specimens which we have personally collected are indicated by our respective initials only, and the full name of the senior author refers to a previously published record.

As regards the evidence afforded by the Brachyura of the geographical relationships of the New Zealand region, our knowledge of the group is still much too imperfect for very precise deductions to be drawn. There are about eleven species which are known only from the original description, and which are in some cases open to doubt; if they are included among the endemic element, the latter constitutes two-thirds of the species whose validity and occurrence in New Zealand are beyond reasonable doubt, and if they are excluded, the proportion is still one-half. This is a high proportion in a group with such means of dispersal in the adult and larval stages. As is natural, the list of names of foreign species which have been recorded, though in all probability incorrectly recorded, from New Zealand, includes a high proportion of Australian and Indo-Pacific forms; but nevertheless there still remains, after these have been subtracted, a strong Australian element—which, in fact, is stronger than any other element except the endemic. Some of these species occur, as far as is known, only in Australia and New Zealand (*Nectocarcinus integrifrons*, *Ommatocarcinus macgillivrayi*, *Cyclograpsus laveuxi*, *Helice crassa*, not to mention some doubtful examples); others are found also in the Kermadecs and other islands to the north of New Zealand (*Ozius truncatus*); and others again are confined to these islands and New Zealand, and do not occur in Australia (*Heterozius rotundifrons*, *Cyclograpsus whitei*). It is not easy to discover the source of these species, but geographically they appear to form a natural group whereby the New Zealand fauna is linked with the Australian.

There is also a more or less cosmopolitan element (*Ovalipes bipustulatus*, *Planes minutus*) whose members have special means of dispersal, and cannot be employed in any argument concerning origins and relationships.
As for the southern forms, a few species (Leptomithrax australis, Prionorhynchus edwardsi) are more common around the Auckland and Campbell Islands than near the mainland; but the absence of species endemic to these islands supports Dr. Th. Mortensen’s recent conclusions (Sacertypk af Vidensk. Medd. fra Dansk. naturh. Foren, Bd. 79, 1925), based on his study of the New Zealand Echinoderms, that the islands in the south are strictly a part of the New Zealand region, and in that sense not truly subantarctic. There is, however, a small but true southern element, represented by Hemigrapsuscrenulatus, Halicarcinus planatus, and Cancer novae-zealandiae, with distinct South American affinities; while Leptograpsus variegatus and Plagusia chabrus occur not only in South America but in Australia and to the north, and possibly represent a former subantarctic element which is spreading into the Indo-Pacific.

To sum up the argument, the evidence from the Brachyura dealt with in this paper is open to considerable doubt, partly because of our imperfect knowledge of the group and partly because of their means of dispersal; but it agrees with Dr. Mortensen’s chief conclusions, that the New Zealand region, including the southern islands, is a very distinct area, with clear evidence of former relationships with Australia, and less pronounced indications of affinities with South America and the Subantarctic.

**Stenorhynchus fissifrons** Haswell.


Only the type specimen, a female, is known from New Zealand; it is said by Haswell to have been deposited in the Macleay Collection, which is now at Sydney University, but a half-day search by the junior author failed to discover it.

**Locality.**—Auckland (Haswell).

**Distribution.**—Port Jackson, Australia (Haswell).

**Type.**—(See above).

**Huenia bifurcata** Streets.


The type specimen is the only one recorded from New Zealand, and the species is one whose occurrence here was considered by Hutton to be very doubtful. It does not appear to be the same as the
widely-spread and very variable *H. proteus* de Haan (known from Japan, China, Australia, Kermadec Islands).

*Locality.—N.Z. (Streets).*
*Distribution.—Australia.*

**Trichoplatus huttoni** A. Milne-Edwards.

— Miers, *Cat. Crust. N.Z.*, p. 4, Pl. 1, Fig. 1. 1876.
*Trichoplatus huttoni* Filhol, l.c., p. 352. 1885.

It has been recognised by all writers, including Miers and Milne-Edwards, that the species described by those authors are identical, and we have taken the further step of uniting Kirk’s name also as a simple synonym of Milne-Edwards’, for the following reasons:

Kirk was unaware of the work of Milne-Edwards, though he wrote several years later; the briefness of Miers’ description and the poorness of his figure, due to the mutilated condition of the only specimen in the British Museum, explain why Kirk distinguished another supposed species, but if he had seen the careful description and the figure given by Milne-Edwards he would hardly have taken that step. It is obvious that Kirk’s species is the same as Milne-Edwards’, and though less obvious it is quite certain that Miers’ is also the same.

The reasons which influenced Kirk were as follows: A drawing of his specimen was forwarded by Hector to Miers, who replied that it was evidently closely related, "the tubercles occupying the same positions, but being in some places replaced by spines, also the rostral spines are longer and more acute. These differences may be due to age or sex. . . . Only an actual comparison of your variety with the type of *H. hectori* would enable me to determine whether it is really distinct" (Hector 1877, p. 474). The differences were found by Kirk not to be due to age or sex, and disregarding Miers’ added caution, and evidently not realising the imperfection of Miers’ figure and description, he proposed the new species. Miers’ comments may be accounted for; the tuft of hairs on the tubercles might well give the latter a spinous appearance in a drawing, and the rostral spines of Miers’ figure are shorter than in any subsequently recorded specimens, including our present series. Curiously enough, Kirk did not include these characters in his diagnosis, but gave characters which, especially in the absence of a figure, can be regarded only as inadequate.

Thus in our opinion *Halimus hectori* Miers and *H. rubiginosus* Kirk are the same, and are synonyms of *Trichoplatus huttoni* Milne-Edwards.
The hand is smooth in the male, much smaller, grooved, and hairy in the female. The carapace, except the frontal and hepatic regions, and also the walking-legs, are finely pubescent. The colour is a dark brown.

Some of the hairs are coiled round and serve to hold fragments of seaweed (of the same colour as the animal) in the same manner as keys are fastened on a split ring. The seaweed is not growing or rooted on the hairs, but pierced by the latter, so that it is probably renewed from time to time. *H. spinosus* Hess (Kermadec Islands) and probably other species have the same habit.

**Locality.**—N.Z. (Milne-Edwards, Miers).

Sumner (Hutton).

Akaroa Heads (J. W. Arthur).

Wellington, Cape Campbell, Napier (T. Kirk).

Cook Strait; east coast of Otago (Filhol).

Stewart Island (W. Traill).

Kaikoura (E.W.B.).

"Occasionally met with in Otago Harbour and on the coast, especially after heavy north-easterly weather." (Thomson).

The species appears to be widely distributed in New Zealand, but nowhere common.

**Distribution.**—Endemic.

**Type.**—Paris Museum.

**Halimus diacanthus** (de Haan).

Pisa (*Naxia*) *diacantha* de Haan, *Fauna japonica*, Crust., p. 96, Pl. 24, Fig. 1. 1839.


Hutton regarded the occurrence of this species in New Zealand as "very doubtful," and did not include it in the *Index Faunae N.Z.*. Ortmann's statement that it does occur is evidently a quotation from Haswell's Catalogue, which in turn depends on Miers and the unreliable labels of specimens in the British Museum. The New Zealand collections which we have seen contain nothing like it.

**Locality.**—N.Z. (Miers).

**Distribution.**—Australia, Philippine Islands, Japan.
Transactions.

Paramithrax.

We have not included this genus in the present survey, and without a revision of the New Zealand representatives we have refrained from assigning our specimens, which are numerous, to the species previously recorded, and therefore do not attempt to give new localities for them. The following species have been recorded from New Zealand, the first three being the commonest:

Paramithrax peronii Milne-Edwards; Miers, Cat. Crust., N.Z., p. 5.  
Paramithrax latreilli Miers (= P. cristatus Filhol = P. barbicornis Miers, not of Latreille); Mission de l'Ile Campbell, p. 358.  
Paramithrax minor Filhol; Mission de l'Ile Campbell, p. 356.  

Leptomithrax australis (Jacquinot and Lucas).

Maia australis Jacquinot and Lucas, Voyage au Pole Sud, Zool., vol. 3, Crust., p. 11, Pl. 2, Fig. 1. 1853.  
— Filhol, Mission de l'Ile Campbell, p. 361, Pl. 38. 1885.  

The genus Leptomithrax is most readily distinguished from Paramithrax by the presence of tubercles but no ridge on the wrist of the former, while the wrist of the latter is strongly ridged. In young Leptomithrax (about an inch in length), there is, however, a nodulous ridge. The differences between L. australis and L. longimanus are very distinct and may be stated as follows:

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<tr>
<th></th>
<th>L. australis.</th>
<th>L. longimanus.</th>
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</thead>
<tbody>
<tr>
<td>Spine at outer corner of orbital cavity</td>
<td>With small accessory spine at base.</td>
<td>Without accessory spine.</td>
</tr>
<tr>
<td>Granules on arm and wrist</td>
<td>On upper and outer surfaces only.</td>
<td>Over the whole of the joints.</td>
</tr>
<tr>
<td>Inner edge of fixed finger</td>
<td>Denticulated for more than half the length, the denticulations extending over the broad curve at the middle into the excavation in the proximal half of the finger.</td>
<td>Denticulations stopping short at the middle of the finger, where the excavation begins; end of the excavation sharply angled.</td>
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</tbody>
</table>
In addition, the arms and hands of _L. longimanus_ are much longer, the legs are stouter, and the branchial regions more inflated at the sides than in the case of _L. australis_.

In young specimens and in the female, the fingers fit closely together along their whole length; there is neither excavation nor inner tubercle.

In his copy of the N.Z. Journal of Science, vol. 1, Hutton has deleted this species from the list of those whose occurrence he formerly considered doubtful; and in Miers' Catalogue he has appropriately noted that the carapace is "spinulose" rather than "covered with smooth tubercles."

**Locality.**—Auckland Islands (Jacquinot and Lucas, Stephens); "Aurora" (specimens in the Canterbury Museum).
Dunedin (Hutton).
Hauraki Gulf, 50 fathoms (G. E. Archev).
"Not uncommon on the coast (Otago). Occasionally taken on the sand-banks by the seine net."
(Thomson).
Off Little Barrier, 35 fathoms (C.C.)

**Distribution.**—Endemic.

**Leptomithrax longimanus** Miers.


—— Miers, _Cat. Crust. N.Z._, p. 8, Pl. 1, Fig. 3. 1876.
—— Filhol, _Mission de l’Île Campbell_, p. 364, Pl. 39, Fig. 4. 1885.

Filhol did not expressly criticize the diagnostic features emphasized by Miers, viz., that the species is "at once distinguished by the great length of the anterior legs, and by the absence of spines on the antero-lateral margins." What Miers may have meant concerning the spines is obscure, and Filhol’s account is more accurate, viz., that except for the absence of the small accessory spine on the post-ocular spine, the spines of the carapace occupy the same positions as in _L. australis_. The spines, in fact, are stout, though not as long or as sharp as in the latter species. As for the "great length of the anterior legs," it is not known whether this applies to the female.

The pubescence mentioned by Miers is apparently transient, and the "small scattered granules" are more accurately described by Hutton (MS.) as "flattened tubercles."

Our largest specimen, a male, slightly exceeds Filhol’s, the proportions of the various dimensions being the same as those quoted by him. They are as follows:

- Length of carapace (including rostral spines) .... 50 mm.
- Breadth of carapace .... 40 mm.
- Length of rostrum .... 7 mm.
- Length of hand .... 46 mm.
- Length of arm, measured from cephalothoracic margin .... 97 mm.
We have several small females from off Cape Maria. The dimensions of the largest, which bears no eggs, are as follows:

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of carapace</td>
<td>30 mm</td>
</tr>
<tr>
<td>Breadth of carapace</td>
<td>21 mm</td>
</tr>
<tr>
<td>Length of arm</td>
<td>33 mm</td>
</tr>
<tr>
<td>Length of hand</td>
<td>16 mm</td>
</tr>
<tr>
<td>Length of first legs</td>
<td>34 mm</td>
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</tbody>
</table>

The arm is therefore only as long as the first legs or the carapace, whereas in the adult male it is twice as long. This may be attributed to age rather than to sex, as shown by still smaller males in our collection; so that the adult female is still unknown. In our small specimens the eyes are prominent, rostral spines divergent, ambulatory legs with long and shorter hairs, including a row of hooked hairs along the upper margins; the whole exoskeleton covered with a fine pubescence, except the arms, which are smooth and slender, wrist scarcely granular; fingers thin, fixed finger with faint sign of excavation.

Postscript.—In writing the above, we overlooked Borradaile’s description of *Paramithrax (Leptomithrax) affinis*; from a comparison of the texts, we consider it likely that our small specimens from Cape Maria may belong to Borradaile’s species (see next species).

**Locality.**—N.Z. (Miers).
Sumner (Hutton).
Stewart Island, 30 fathoms (Filhol).
Puysegur Point, Stephens Island (T. B. Smith).
10 miles N.W. from Cape Maria; Little Barrier, 35 fathoms (C.C.).

**Distribution.**—Endemic.

*Leptomithrax affinis* Borradaile.


This species has been created by Borradaile for a single female specimen, which he considers distinct from *L. longimanus*, though admittedly closely related to it. We have not compared Borradaile’s description with some young specimens which we have identified with *L. longimanus* (see postscript to that species), but they appear to agree well, especially as regards the chelipeds and the spines of the rostrum. We have noted above that the chelipeds of young specimens of both New Zealand species of *Leptomithrax* (according to our identification) are intermediate between those of adult *Paramithrax* and *Leptomithrax*, and this may be Borradaile’s reason for placing his species and *L. longimanus* in a subgenus of *Paramithrax*. The localities of our young specimens and Borradaile’s species agree well, and *L. longimanus* is known, apart from our record, only from much more southern localities. But while we have drawn attention to the differences between these small females and adult males, we have preferred to regard them as due to age and sex, for the adult female
of *L. longimanus* is otherwise unknown. Borradaile's specimen was small and evidently not egg-bearing; he admits that the differences in the chelipeds at least may be due to sex, and he describes the species with some degree of doubt. Under the circumstances, it appears quite possible that *L. affinis* is a synonym of *L. longimanus*.

**Locality.** Near Three Kings Islands, 100 fathoms (Borradaile).

**Distribution.**—Endemic.

**Type.**—Brit. Mus.

**Echinomaiia hispida** Borradaile.


This very interesting addition to the list is based on two male specimens, for which Borradaile has founded a new genus and species.

**Locality.**—Near Three Kings Islands, 100 fathoms (Borradaile).

**Distribution.**—Endemic.

**Type.**—British Museum.

**Acanthophrys filholi** A. Milne-Edwards.


--- Filhol, *Mission de l'Ile Campbell*, p. 365, Pl. 39, Figs. 1-3, Pl. 40, Fig. 8. 1885.


Filhol has copied in toto the description given by Milne-Edwards, and has added a figure, but little else. The female has therefore not hitherto been characterized; but specimens in our collections show that it agrees with the male, except that the flanges on the arm are not as exaggerated and the teeth are not as prominently denticulated; the female arm and hand are much smaller than those of the male.

We can verify Filhol's remark that the species is "very remarkable for the enormous quantities of algae, bryozoa, sponges, and ascidians, which live fastened on to the numerous hairs covering the carapace."

**Locality.**—Stewart Island (Milne-Edwards).

Stewart Island, on oyster-beds, very abundant (Filhol).

Nora Niven, Stations 17, 26, 44 (Chilton).

New Brighton, drift (H. Suter).

10 miles N.W. off C. Maria; off West King, 60-65 fathoms (C.C.).

**Distribution.**—Endemic.

**Type.**—Paris Museum.
Transactions.

Paramicippa spinosa Stimpson.

(Paramicippa spinosa var. affinis Miers.)


— Filhol, Mission de l'Ile Campbell, p. 367. 1885.


— Miers, Challenger Reports, Zool., vol. 17, p. 70, Pl. 8, Fig. 3. 1886.


— Hale, Crust. S. Austr., p. 140. 1927.

Opinions have vacillated concerning the distinctness or otherwise of the variety. Miers, for example, described *P. affinis* as new (1876), and eight years later stated that the British Museum contained specimens of *P. spinosa* from New Zealand, these being presumably the same as those previously described as new. In 1886 he stated that the form *affinis* was distinct, and ranked it as a variety. Our non-committal attitude allows us to include references to the species s.str. as well as to the supposed variety, and does not imply a denial of the distinctness of the latter; it has, for example, been recognized in Australia.

Hutton doubted the occurrence of this species or variety in New Zealand (1882), but it is included in the Index under the name *Micippa spinosa* (p. 248). He has no MS. comment. We have seen no specimens, and can only state that both the species and the variety have been recorded from Australia and from New Zealand, but that the New Zealand records are doubtful.

Prionorhynchus edwardsii Jacquinot and Lucas.

Prionorhynchus edwardsii Jacquinot and Lucas, Voyage au Pole Sud., vol. 3, Crust., p. 8, Pl. 1, Fig. 1. 1853.

— Miers, Cat. Crust. N.Z., p. 11. 1876.


— Filhol, Mission de l'Ile Campbell, p. 367, Pl. 42, Figs. 1-4. 1885.


In very small specimens (carapace 30 mm. long) the granulations on the legs are prominent and extend over all parts except the palm and fingers; in adult specimens they are flat and minute.
"This species lives at a depth of 4 to 5 metres (2 to 3 fathoms) and is never met with on the shore or under stones. It collects in large groups of two to three hundred individuals, and such groups may be seen on the sea-bottom, covering a considerable area."
(Filhol).

**Locality.**—Auckland Islands (Jacq. and Lucas; Hodgson; Stevensen).
Campbell Island, abundant (Filhol).
Stewart Island (Chilton).
Otago Heads, occasionally in large numbers. (Thomson).
Stewart Island, occasionally in large numbers (W. Traill).

**Distribution.**—Endemic; chiefly at southern islands.

**Euryonomus australis** Milne-Edwards and Lucas.


Our specimens agree well with Hutton’s MS. note, ‘‘Claws purple, inner margins white.’’

Filhol (l.c., p. 371) proposes a variety *stewarti*, but seems to confess that it is based on individual variations scarcely sufficient to justify the distinction of a variety. His figure is of the supposed variety. The locality quoted is Stewart Island; our only specimen from there is normal, while a specimen from near Oamaru is much punctuated, like the variety.

**Locality.**—N.Z. (Miers; Austr. and Macleay Museums, Sydney).
Bay of Island (Dana).
Sumner, Chatham Islands (Hutton).
Stewart Island, Cook Strait, Massacre Bay; very abundant on muddy bottoms at a depth of 15 fathoms (Filhol).
Stewart Island (W. Traill).
Chatham Islands (W. Maxwell Young, Miss S. D. Shand).
Cape Maria; near Oamaru, 20 fathoms (Capt. Bollons).
French Pass; Akaroa Heads (Lenz).
Very occasionally met with on the east coast of Otago (Thomson).
Moko Hinau (C. R. Gow).
Kapiti Island (Wanganui Museum).

**Distribution.**—Endemic.

**Type.**—Paris Museum.

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Cancer novae-zealandiae (Jaqquinoit and Lucas).

Platycarcinus novae-zealandiae Jacquinot and Lucas, Voyage au Pole Sud., Zool., vol. 3, Crust., p. 34, Pl. 3, Fig. 6. 1853.
— Miers, "Erebus and Terror," Zool., Crust., p. 2, Pl. 1, Fig. 5. 1874.
— Filhol, Mission de l'Ile Campbell, p. 371. 1885.
— Stephensen, Dr. Th. Mortensen's Pacific Exped. 1914-16, 40, p. 293. 1927.

Carapace wide, moderately flattened in the male, much more in the female. Surface covered with little granulations; regions scarcely distinct; antero-lateral margins with ten lobes, which project very slightly beyond their lines of coalescence; each lobe with 2 to 5 crenulations. The posterior lateral margin, which commences immediately behind the tenth lobe, is closely granulous. First lobe small, on upper orbital margin; the latter has no tooth or spine except the point at the inner corner, which is less prominent than the front. Front with three other teeth, of which the median is much smaller and more depressed than the rest. Anterior legs with the wrist very granulous externally, usually with a large tubercle near the margin, and a strong tooth on the inner side; hand granulous above, with two parallel lines, each having three or four tuberces larger than the granulations, and with five granulous lines on the outer side, of which the lower four are well marked. Movable finger granulous above, both fingers strongly denticulate within, black within and at the tips. Ambulatory legs robust and of moderate length. Seventh joint of the abdomen of the male slender and elongate.

"This species is very probably identical with the C. plebeius Poeppig, from Chili. The granulated ridges on the claws, and the shape of the teeth on the latero-anterior margin vary much in the specimens in the Museum, from both localities, but A. Milne-Edwards in his monograph above quoted, considers the species distinct." (Miers, 1874). Though we have not seen specimens from Chili, we have verified that the New Zealand form is variable in the respects mentioned by Miers, and also in the distinctness or otherwise of the outer tubercle of the hand. The lobes of the antero-lateral margins are sometimes black.

In order to settle the question of the distinctness or otherwise of the two species specimens of C. novae-zealandiae were, in 1910, sent to Dr. Calman of the British Museum for comparison with C. plebeius. In his reply he drew attention to Miss Rathbun's paper on "The Stalk-eyed Crustacea of Peru and the adjacent coast (Proc. U.S. Nat. Museum, vol. 38, pp. 531-620) in which the original figure of C. plebeius is reproduced and added "There is no doubt, from the speci-
mens we have, that the species is perfectly distinct from the New Zealand one. Milne-Edwards in his Famille des Cancériens (Nouv. Arch. Mus. Hist. Nat. 1, 1865, p. 190) says 'Cette espèce ressemble beaucoup au Cancer plebeius des cotes du Chili. Elle peut cependant s'en distinguer facilement si l'on observe les granulations des pinces et le forms des dents ou lobes qui découpent les bords latéro-antéri-eures. Chez le C. novaesealandiae les neuvième et dixième lobes sont arrondies et peu avancées; au contraire chez le C. plebeius, ces lobes prennent la forme de véritables dents, ils sont plus ou moins triangulaires et aiguës.'

"This difference in the form of the lateral lobes is," continues Dr. Calman, "well seen in the figure reproduced by Miss Rathbun. There are, however, many other characters distinguishing the two:—the hands are much more elongated in C. plebeius, the dorsal surface of the hands is smooth between the ridges, the carapace is less vaulted and more uneven, the median tooth of the front is more prominent, the dorsal roof of the orbit is less swollen between the sutures, etc. Altogether I think the species are very well distinguished."

The dimensions may greatly exceed those hitherto recorded, as shown in the following list:—

<table>
<thead>
<tr>
<th></th>
<th>Miers 1874</th>
<th>Miers 1876</th>
<th>Filhol</th>
<th>Large specimen from Lyttelton</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>57 mm.</td>
<td>48</td>
<td>36</td>
<td>78</td>
</tr>
<tr>
<td>breadth</td>
<td>87 mm.</td>
<td>70</td>
<td>52</td>
<td>127</td>
</tr>
</tbody>
</table>

**Locality.**—N.Z. (Miers).

Akaroa (Hombron and Jacquinot).
Lyttelton, Port Levy, Sumner (Hutton).
Cook Strait, Stewart Island; very abundant on muddy bottom at a depth of 5 to 8 fathoms (Filhol).
Auckland Islands (Chilton, Stephensen).
Wellington (Macleay Collection).

Extremely abundant in Otago Harbour and along the coast-line, from the exposed sand-beach to 30 fathoms (Thomson).

Auckland Harbour, Akaroa, Kaikoura, Lyttelton Harbour, Sumner, Taylor's Mistake, Timaru; small specimens very common in pools, under stones, and sluggishly sheltering among weeds and Polyzoa in intertidal zone; larger ones chiefly in deeper water or as drift on beaches (E.W.B.).

French Pass (Lenz).
Nukumaru (Wanganui Museum).

**Distribution.**—Endemic, evidently commoner in the South than in the North Island.
Transactions.

Megametope rotundifrons (Milne-Edwards).


Megametope rotundifrons Filhol, Mission de l’Ile Campbell, p. 373, Pl. 44, Fig. 3. 1885.


The record of this species is somewhat unsatisfactory, in that Filhol, on whose mention of Cook Strait and Foveaux Strait the record depends, did not list the species under a caption of its own, but merely en passant while referring to Heterozius rotundifrons. The history of the species has been dealt with by McNeil (1926, p. 130). It has not been recognised by New Zealand collectors.

Locality.—N.Z. (Filhol —?).

Distribution.—Australia.

Type.—Paris Museum.

Heterozius rotundifrons Milne-Edwards.


—— Miers, Cat. Crust. N.Z., p. 15. 1876.

—— Filhol, Mission de l’Ile Campbell, p. 372, Pl. 44, Figs. 6-7. 1885.


Carapace flattened, scarcely grooved, smooth. Antero-lateral margins very long, so that a line joining their posterior angles would divide the carapace into two unequal parts, of which the anterior would be much the larger. They form a regular curve with the front, interrupted only by the orbits, anterior median fissure, and two small lateral fissures; the latter obscurely define two lobes. From the first fissure arises a shallow groove which limits the hepatic region behind, and ends in a deeper pit not far from the margin and parallel to it. A minute antero-lateral fissure sometimes occurs in front of the normal two. The cardiac region is marked laterally by a curved shallow groove, concave outwards. Front of carapace narrow, prominent, and, except for the faint median sulcus, rounded in the middle. Basal joint of the external antennae so small that the latter are scarcely separated from the fossettes of the inner antennae. Under surface of the body and legs covered with very short hairs, especially in the female. Hands equal in the female, right hand enlarged in the male. Unenlarged hands rounded above, and smooth, except for a faint longitudinal groove along the upper outer surface, in a line with the movable finger; on the upper inner surface of the hand, near the wrist, is a small tubercle, variable in size; adjacent to it, the angle of the wrist sometimes makes a small tubercle. Fingers slender, as long as the palm, and nearly straight; each finger bears six to eight teeth, which are distant and separated by much finer denticulations; the fingers cross slightly at the tip. In the right hand of the male, the palm is much swollen, the tubercle is much more distinct, groove very faint; fingers thick, separated at the base, with the larger teeth prominent.
CHILTON–BENNETT.—*Revision of Crustacea Brachyura of N.Z.* 747

The above description contains some additions to those of Miers and Milne-Edwards.

Filhol states that usually the right arm of the female is more enlarged than the left, whereas a study of about 75 females in our collections has shown that only three had the right arm longer than the left.

In a few of our collections, the males are twice as numerous as the females, but these proportions are more than reversed in most of the collections; of 165 specimens from 14 localities, only 51 are males. Possibly the females are more numerous, but remain secluded while carrying eggs.

Filhol’s figure shows four lateral fissures on the carapace. Also the margin of the carapace appears to be continued horizontally to the posterior end, whereas in our specimens the postero-lateral parts of the carapace are excavated to form a recess for the last pair of legs.

In recording the dimensions of his specimens, Lenz appears to have transposed the length and breadth. Measurements of some of our specimens are as follows (millimetres):

<table>
<thead>
<tr>
<th></th>
<th>Average female</th>
<th>Average male</th>
<th>Large female</th>
<th>Large male</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of hand</td>
<td>11.5</td>
<td>17</td>
<td>14</td>
<td>27.5</td>
</tr>
<tr>
<td>Breadth of hand</td>
<td>3</td>
<td>9</td>
<td>4.5</td>
<td>15</td>
</tr>
<tr>
<td>Length of carapace</td>
<td>13</td>
<td>14</td>
<td>17.5</td>
<td>19</td>
</tr>
<tr>
<td>Breadth of carapace</td>
<td>18</td>
<td>20</td>
<td>25.5</td>
<td>25</td>
</tr>
</tbody>
</table>

*Locality*—N.Z. (Milne-Edwards, Miers, Macleay collection).
Chatham Islands, Cook Strait (Hutton).
Nelson, Cook Strait (Filhol).
Stewart Island (Filhol, Hutton, W. R. B. Oliver, C.C.).
Robin Hood Bay, Marlborough (G. Bigg-Wither).
Cook Strait, Bay of Islands (G. E. Archey).
Rangitoto (W. R. B. Oliver, G. E. Archey).
Puysegur Point, Stephens Island (T. B. Smith).
French Pass (Lenz).
Russell, Wellington Harbour, Queen Charlotte Sound (C.C.).
Sumner, Kaikoura (E.W.B.).
Wellington Harbour (Wanganui Museum).

*Distribution.*—New Caledonia.
*Type.*—Paris Museum.

**Leptodius nudipes** (Dana).

—— Dana, *U.S. Expl. Exped.*, vol. 13, pt. 1, p. 209, Pl. 11, Fig. 12. 1855.
— Rathbun, *U.S. Fish Commission Bulletin* for 1903, pt. 3, p. 848, Pl. 9, Fig. 3. 1903.


(Not *Xantho nudipes* Milne-Edwards).

Although Hutton expressed a doubt whether Milne-Edwards’ record of this species from New Zealand was correct, he has written the note “Cook Strait” in his copy of Miers’ Catalogue, but this may be merely a quotation from Filhol, who says the specimens in the Paris Museum came from Cook Strait.

Locality.—N.Z. (Milne-Edwards).

Cook Strait (Hutton, MS.).

Distribution.—New Caledonia, Sandwich Islands, Kermadec Islands.

**Leptodius eudorus** Herbst.

*Leptodius eudorus* Herbst, *Krabben*, vol. 3, Pl. 2, Fig. 3. 1799.


(Not *Xantho eudora* Owen, 1839).

Hutton has questioned the occurrence of such a species in New Zealand. It is conspecific with *Leptodius nudipes* Dana, and must bear the same generic name; but there is some doubt as to what the latter should be. New Zealand authors have used *Chlorodius* for the present species, and Alcock has recommended *Xantho*—which causes trouble with Owen’s *Xantho eudora*. Fortunately there is the authority of Miss Rathbun and of Bouvier for the use of *Leptodius*.

The species, after all, may be merely a subspecies of *L. nudipes*, as Filhol considered it to be. At present it can hardly be reckoned to be an authentic member of the New Zealand fauna.

**Xantho spinotuberculata** Lockington.


It is not likely that much will be lost by ignoring this record, as has been done in the *Index Faunae N.Z.*
Pilumnus.

The crabs of the genus Pilumnus are not common in the littoral zone in New Zealand; they are somewhat solitary in habit, and rendered inconspicuous by their covering of grey hairs and the flocculent matter entangled in the latter. As moreover they are of sluggish and retiring habits, it is not surprising that they are very imperfectly known. The genus as a whole contains a great number of species, differing for the most part in confusingly small details. We have not revised the New Zealand species in this paper, which therefore has the merit of not adding any new species, though one or two are known to us.

Five species have been reported from New Zealand, but only three of the records appear to be valid. P. vespertilio is a well-known species, common throughout the Indo-Pacific; it was included in Miers' Catalogue, but placed on Hutton's "black list." Specimens of a species of Pilumnus occasionally found in the tangled holdfast of the seaweed Macrocystis and in similar places in Lyttelton Harbour were sent to Dr. Calman of the British Museum, who replied that they were identical with specimens from New Zealand in the British Museum labelled P. vespertilio by Miers, but that these were certainly not P. vespertilio on the evidence of the other specimens so labelled in the British Museum collection and on the evidence of the description given by Alcock, (Journ. Asiatic Soc. Bengal, 67 (2), 1898, p. 192.). The Lyttelton specimens were referred by Calman to de Man, who reported that they appeared to him to belong to Pilumnus novaezealandiae Filhol. It is quite as certain that the record of P. tomentosus by Miers was also incorrect. Hutton has not named it among the excludenda, but has crossed it off from his copy of the Catalogue; and though it is known in great detail from Whitelegg's very full description (Mem. Austr. Mus., 4, vol. 2, p. 149, 1900) it has not been recognised in New Zealand. Filhol did not collect either species, but described two more, P. spinosus and P. novaezealandiae. Although Miss Rathbun considers that Filhol has misunderstood P. tomentosus (Biol. Results "Endeavour" Exp. 1909—14, p. 119), his two new species are apparently both valid. A further species, P. maori, has been described by Borradaille (Brit. Antarct. Exp. 1910, Zoology, vol. 3, p. 99, Fig. 10) from a single very small male, 6 mm. in length, dredged in 70 fathoms near East Cape during the British Antarctic Expedition of 1910, and his description agrees well with some twelve specimens, representing both sexes, in our collections; they are, however, much larger, up to 21 mm. in length, and were collected at Ponui Island, Ponsonby Reef, and Akaroa.

Pilumnopeus serratifrons (Kinahan).

Ozius serratifrons Kinahan, Journ. Roy. Soc. Dublin, vol. 1, p. 113, Pl. 4, Fig. 1. 1856.

Pilumnopeus serratifrons Miers, Cat. Crust. N.Z., p. 20. 1876.
— Filhol, Mission de l'Ile Campbell, p. 378. 1885.
— Haswell, Cat. Crust. Austr., p. 70, Pl. 2, Fig. 1. 1882.

There is only weak evidence that this crab occurs in New Zealand. It was recorded by Miers (1876), and though he again referred (1884) to New Zealand specimens in the British Museum, this does not refute Hutton's view (1882) that it should be excluded from our list.

Ozius truncatus A. Milne-Edwards.

Ozius truncatus A. Milne-Edwards, Hist. Nat. Crust., vol. 1, p. 406, Pl. 16, Fig. 11. 1834.
Ozius lobatus Heller, Reise der Novara, Zool. Bd. 2, abt. 3, p. 21, Pl. 2, Fig. 4. 1863.
Ozius truncatus Dana, U.S. Expl. Exped., vol. 13, Crust., pt. 1, p. 230, Pl. 13, Fig. 4. 1852.


(Not Xanthodius lobatus Milne-Edwards, 1880).

This species was originally recorded by Milne-Edwards from Australasia; Filhol, who had access to the same collections, states that Milne-Edwards’ type specimen was from Australia, and we do not know whether there were more specimens from New Zealand; Filhol adds, however, that he himself had collected a specimen in New Zealand which was exactly the same. Dana has recorded the species from the Bay of Islands. According to Miers, specimens from both countries and from Lord Howe Island are in the British Museum, but again it is not clear whether true O. truncatus from New Zealand is included. Some and perhaps all of the specimens so named by Miers were those labelled O. deplanatus by White, these being included by Miers—with some doubt and certain qualifications of the description—in O. truncatus.

Now it is this amended description which most accurately applies to the specimens before us, viz., “the antero-lateral margins are granulous, the anterior tooth very broad and scarcely distinct; the second, obtuse; the third and fourth more acute, but still broad.” As this refers to White’s specimens only, and the rest of O. truncatus as determined by Miers had the “lateral-anterior margins short, and divided into four or five wide obtuse lobes,” and as our specimens have, for example, no sign of a fifth lobe, we conclude that the specimens before us are what White called O. deplanatus. And further, as the only clear statement of the record of O. truncatus in New Zealand, apart from O. deplanatus, depends on Dana’s mention of
the Bay of Islands, we conclude that the commoner species in New Zealand, and possibly the only one, is what White called *O. deplanatus*.

The question therefore is whether *O. deplanatus* is a synonym of *O. truncatus*; and the question is further complicated by the fact that Heller has a species, *O. lobatus*, which appears to agree with the New Zealand specimens, though the localities mentioned by him for *O. lobatus* were Shanghai, Sydney, and Tahiti.

Specimens of the New Zealand species were sent in 1914 by the senior author to Dr. W. T. Calman at the British Museum, who replied: "The crab you send is undoubtedly the same species as the numerous specimens (including those from New Zealand) determined as *O. truncatus* in our collection. We have none determined as *O. lobatus*. De Man discusses the two species and figures the type-specimens of both in *Abh. Senckenb. Natf. Ges.*, 25, p. 628, Pl. 21, Figs. 22-23, 1902. He thinks they are distinct species, but I should doubt it." We have not seen the work referred to, and are unable at present to decide definitely upon the status of either White's *O. deplanatus* or Heller's *O. lobatus*. Lenz quotes with approval the opinion of Haswell that *O. truncatus* and *O. lobatus* are identical, and we can only repeat the caution (Chilton, *Trans. N.Z. Inst.*, vol. 43, p. 556, 1911) that "a comparison of typical specimens is desirable before the two are combined."

There is thus some doubt as to the correctness of the above synonymy, in which *O. deplanatus* and *O. lobatus* are reduced to synonyms of *O. truncatus*; but it does not seem to have been realised that if they are synonymous with one another but not with *O. truncatus*, the name *deplanatus* has priority over *lobatus*.

**Locality.—** N.Z. (White, Miers).

Bay of Islands (Dana).
Auckland (Hutton—specimens labelled *O. truncatus* are in the Canterbury Museum).
North part of the South Island (Filhol).
Cuvier Island (Grenfell and Barr).
Portland Island (C. Riesop).
Auckland, Tiri-tiri (*O. lobatus*) (Lenz).
Mokohinau (C. R. Gow).

"Common on the northern shores of New Zealand—from Portland Island northwards. During the 'Hinemoa' trip, 1914-1915, I got it at various places on the east and west coasts—Cuvier Island, Kaipara Harbour, etc." (C.C., MS.).

This species scarcely extends to the South Island.

**Distribution (O. lobatus).—** Australia, Kermadeces.

**Panopeus otagoensis** Filhol.

*Panopeus otagoensis* Filhol, *Mission de l'Ile Campbell*, p. 379, Pl. 40, Fig. 1.

This species is known from a single male specimen collected by Hutton at Port Chalmers and described by Filhol. It would thus appear that the species is endemic, and that the type is in the Paris Museum.
Rupellioides convexus A. Milne-Edwards.

— Filhol, *Mission de l’Ile Campbell*, 1885, p. 381, Pl. 41, Fig. 7.

Milne-Edwards has described this species from material collected by Quoy and Gaimard at Massacre Bay; but Hutton has queried its validity, and it does not seem to have been seen again.

**Portunus pelagicus** (Linnaeus).

— de Haan, *Fauna japonica*, Crust., p. 37, Pls. 9, 10.
— Rathbun, "*Endeavour*" *Sci. Results*, p. 130. 1923.

The claim of this crab to be a constituent of our fauna depends on the label of a British Museum specimen collected by Sowerby, and has been rejected by Hutton. The crab, however, is "a common species in the Sydney market" (Haswell), so that it is liable to turn up within the northern part of the New Zealand region.

**Locality.**—N.Z. (Miers).

Not N.Z.? (Hutton).

**Distribution.**—Red Sea, Indian Ocean, East Indies, Philippines, China, Japan, east coasts of Australia.

**Portunus sayi** (Gibbes).

— Dana, *U.S. Explor. Exped.*, vol. 13, Crust., p. 273, Pl. 16, Fig. 8. 1852.
One specimen in the British Museum, identified by Miers, is the sole claim of this American species to be included in the New Zealand fauna. Hutton has questioned its occurrence, and it has not been found again.

**Portunus pusillus** Leach.


Kirk’s record is unsubstantiated, and probably depends on a wrong identification; but species of this genus are liable to stray beyond their usual range.

With regard to the generic name, a strict adherence to the rules of nomenclature would invalidate *Portunus* for this and the next species at least, leaving them and some others without a generic title. Miss Rathbun has discussed the case (*Proc. Biol. Soc. Washington*, vol. 9, pp. 153-167, 1897), and has pointed out that there is a valid name available in *Liocarcinus* Stimpson (*Bull. Mus. Comp. Zool., Harvard*, vol. 11, pp. 145-6, 1869); but most writers have refused to abandon the familiar name, chiefly on the grounds of inconvenience. In a recent study of the British species, Palmer has sought for less indefensible reasons, and having found only equivocal ones has referred the matter to the International Commission for a decision (*Journ. Mar. Biol. Station, Plymouth*, n. s., vol. 14, p. 877, 1927).

**Locality.**—Cook Strait (Kirk).

**Distribution.**—Mediterranean, west coasts of Europe and America.

**Portunus corrugatus** (Pennant).

*Cancer corrugatus* Pennant, *Brit. Zool.*, 4, p. 5, Pl. 5, Fig. 9.


Borradale records this species from New Zealand, where a small female specimen was dredged in moderately deep water at Station 134.

**Locality.**—Spirits Bay, 11-20 fathoms (Borradale).

**Distribution.**—Very widespread—Australia, Japan, Red Sea, Mediterranean, W: Atlantic.

**Nectocarcinus integrifrons** (Latreille).


— Miers, *Zool. Erebus and Terror*, Crust., p. 2, Pl. 1, Fig. 3 (young). 1874.
— Filhol, Mission de l'Ile Campbell, p. 353. 1885.
— Rathbun, Scientific Results "Endeavour," p. 130. 1923.

It is hardly surprising that an Australian swimming-crab should turn up in New Zealand, but it is curious that while three naturalists from abroad have recorded it, and one has stated that it is abundant, the species remains unknown to local naturalists.

**Locality.**—N.Z. (Milne-Edwards).
Bay of Islands (Miers).
Cook Strait and east coast of South Island, abundant (Filhol).

**Distribution.**—Australia, Tasmania.

Nectocarcinus antarcticus (Jaeq. and Lucas).

Portunus antarcticus Jacq. and Lucas, Voyage au Pole Sud, 3, Crust., p. 51, Pl. 5, Fig. 1. 1853.
— Miers, Zool., "Erebus and Terror," Crust., p. 2, Pl. 1, Fig. 2. 1874.
— Filhol, Mission de l'Ile Campbell, p. 383. 1885.

In addition to specimens from other localities clearly belonging to this species we have a good series of small crabs, including egg-bearing females whose breadth in some cases is only 12 mm., from Colville Channel and off Little Barrier. We have provisionally referred them to this species, but they may prove to be different and possibly to belong to another genus. The back is more corrugated and the frontal and antero-lateral spines are prominent, especially the pair of post-lateral spines; the latter give rise to a ridge across the carapace resembling the dorsal structure of Thalamita and related genera.

Jacquinot and Lucas and others describe the front as 4-toothed, Miers as 6-toothed; the latter reckoning includes the inner orbital spine.

"It is an extremely active and pugnacious species." (Thomson).
Locality.—N.Z., Auckland Islands (Miers, Hodgson). Auckland Islands (Jacquinot and Lucas, Hutton, Stephensen).
            Stewart Island (W. Traill).
            East coasts of Stewart and South Islands (Filhol).
            Wellington (Hutton, Macleay Collection).
            Castlecliff (Wanganui Museum).
            "Nora Niven" stations 2, 5, 12, 23, 26, 30, and Chatham Islands (Chilton).
            10 miles N.W. of Cape Maria; off Little Barrier, 35 fathoms (C.C.).
            Cloudy Bay, 19 fathoms (Captain Bolons).
            The Watchman, Hauraki Gulf (G. F. Pirrit).
            Stomachs of toad-fish (Neophrynichthys), etc. (E.W.B.).
            Common in Otago and the adjacent seas (Thomson).

Distribution.—Endemic, including the Auckland and Chatham Islands; commoner in the south.

Thalamita sima Milne-Edwards.

— Miers, Cat. Crust. N.Z., p. 28. 1876.
— Filhol, Mission de l'île Campbell, p. 382. 1885.
— Stimpson, Smiths. Miscell. Coll., vol. 49, p. 83, Pl. 11, Fig. 2. 1907.

The New Zealand record of this crab depends on the label on a purchased specimen in the British Museum, as related by Miers (1876 and 1884). It is on Hutton's "black list," but members of this family are not to be lightly excluded.

Locality.—N.Z. (Miers).

Distribution.—Indo-Pacific—Red Sea, Java, Japan, China, Australia.

Ovalipes bipustulatus (Milne-Edwards).

Anisopus trimaculata de Haan, Fauna japonica, Crust., decas. 1, p. 13, 1833.
Corystes (Anisopus) punctatus de Haam, op. cit., p. 44, Pl. 2, Fig. 1, 1835.
Platyonicus purpurea Dana, U.S. Expl. Exped., Crust. 1, p. 291, Pl. 18, Fig. 3, 1852.
Platyonicus bipustulatus Miers, Zool. Erebus and Terror, Crust., p. 2, Pl. 1, Fig. 1, 1874.
— Miers, Cat. Crust. N.Z., p. 32. 1876.
— Ortmann, Zool. Forschungsreisen in Austr., Bd. 5, lief. 1, p. 44. 1894.
— Doflein, Wiss. Ergeb. Deutschen Tiefsee Exped. 1898-9, p. 92, Pl. 23, Fig. 6. 1904.

The bibliography of this almost cosmopolitan crab is much more extensive than indicated by the above list; fortunately many of the names have not entered into New Zealand literature. Different authors give somewhat different versions of the synonymy, especially of that of the earlier accounts.

The crab is widely distributed around the New Zealand coast; a list of localities is rather a formality, and the authors have taken it in various places in addition to those listed below. It especially prefers a sandy beach in the immediate vicinity of rocks, and is so voracious and determined that it can readily be caught and hauled out of the water by a string baited with mussel. There appears to be discrepancies in the local literature concerning the method of burrowing in the sand (cf. Chilton 1911, p. 554, and Thomson 1913, p. 237); the junior author has seen it burrow tail first, using the fifth legs to root up the sand until only the eyes protrude above the surface.

Locality.—N.Z. (Miers).
Wellington (Hutton, Australian Museum, Macleay Collection).
Chatham Islands (E. R. Waite).
Sumner, Stewart Island (C.C.).
Locality.—Lyttelton, Sumner, Taylor’s Mistake, Kaikoura, Timaru, Castlecliff, etc. (E.W.B.). Ponui Island (W. J. Barr). Greymouth (R. Helms). Robin Hood Bay, Marlborough (G. Bigg-Wither). Ocean Beach, Dunedin; very common in Otago (Thomson).

Distribution.—Indo-Pacific; Indo-Malaysian and Australian seas, Kermadec Islands, Juan Fernandez, Argentine, Chili, Patagonia, Trinidad Channel, Japan, Cape of Good Hope.
In the Atlantic it is represented by O. ocellatus.

Ovalipes ocellatus (Herbst).

—— Bell, British Crust., p. 82.
—— Hector, Trans. N.Z. Inst., vol. 9, p. 473, Pl. 27, Fig. 1.
—— Filhol, Mission de l’Ile Campbell, p. 383. 1885.

A specimen of this crab from Wellington Harbour was identified by Hutton, and the identification verified by Miers from a drawing submitted by Hector. Filhol has since stated that the Paris Museum contains a fine specimen collected at Dunedin by Hutton. It has not otherwise been recorded from these shores, and if correctly identified, may be regarded as an occasional wanderer rather than as established in New Zealand waters.

Locality.—Wellington Harbour (Hutton).
Dunedin (Hutton, fide Filhol).

Distribution.—East America (N.W. Atlantic).

Ommatocarcinus macgillivrayi White.

Ommatocarcinus macgillivrayi White, Appendix to Stanley’s Narrative of H.M.S. Rattlesnake, vol. 2, p. 393, Pl. 5, Fig. 1. 1852.
—— Filhol, Mission de l’Ile Campbell, p. 385. 1885.
—— Stebbing, Hist. Recent Crust., p. 92. 1893.

The senior author (i.e., p. 292) has already united the names O. macgillivrayi and O. huttoni, and our present series (12 specimens,
large and small, of both sexes) confirm the conclusion that there is only the one species in New Zealand, though there is still room for doubt. In identifying our species with the Australian *O. macgillivrayi* there is also room for doubt, but not having had Australian specimens for comparison we follow previous authors on this point. The usage of the names has been as follows:—White described *O. macgillivrayi* from a single male collected in Australia; Filhol described *O. huttoni* from a single female collected in New Zealand, and gave reasons for considering the two distinct. Miers had a young male and two small egg-bearing females from New Zealand; being unacquainted with Filhol’s work, he did not mention *O. huttoni*, and assigned his specimens to *O. macgillivrayi*, but mentioned differences which, he remarked, “will perhaps be found to be of specific importance.” The presumption is that although Miers did not find a new species for his three small specimens, he would readily have referred them to *O. huttoni* if he had known of that species. Our young males are quite similar to his, and young and older females connect these with what Filhol called *O. huttoni*; and we consider that the older males in our collection, and those reported by previous writers, are the same species again. We follow precedent in identifying that species with the Australian *O. macgillivrayi*; although we have had no specimens of the latter, we note the following points in which New Zealand males differ from White’s short description:—The chelipeds may be five times as long as the carapace (White states 2½ times); the chelipeds have no sign of a spine at the middle; the wrist is not toothed on the inside; and the inner surface of the hand is very broadly rounded and scarcely ridged.

The dimensions of a large male are as follows:—

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breadth of carapace</td>
<td>17 mm.</td>
</tr>
<tr>
<td>Length of carapace</td>
<td>7 mm.</td>
</tr>
<tr>
<td>Length of merus</td>
<td>5 mm.</td>
</tr>
<tr>
<td>Length of hand</td>
<td>7 mm.</td>
</tr>
<tr>
<td>Total length of chelipeds</td>
<td>14 mm.</td>
</tr>
</tbody>
</table>

On the small males, the merus has a spine on each of the two upper edges, and the lower has three or four sharp spines.

**Locality.**—N.Z. (Filhol).
Queen Charlotte Sound, 10 fathoms (Miers).
10 miles from Cloudy Bay, 19 fathoms; Whale Rock, Bay of Islands, 15 fathoms (Capt. Bollons).
Stewart Island (W. Traill).
“Nora Niven” Station 19 (Chilton).
Bare Island, near C. Kidnappers, 37 fathoms (C.C.).
Off Banks’ Peninsula, 20 fathoms (E.W.B.).
“Occasionally taken in trawlers, and found in the stomachs of fishes, from outside Otago Heads.” (Thomson).

**Distribution.**—Australia.
Hemiplax hirtipes (Jaq. and Lucas).

Hemiplax hirtipes Heller, Voyage der Novara, Crust., p. 40, Pl. 4, Fig. 3. 1865.
— Miers, Cat. Crust. N.Z., p. 34. 1876.
— Filhol, Mission de l'Ile Campbell, p. 385. 1885.
— Miers, Challenger Reports, vol. 17, p. 251. 1886.

This crab has given rise to much trouble, concerning both its generic position and especially its identity. The confusion is not lessened by the fact that the same specific name was independently chosen for two supposedly different species, which we now find it necessary to unite; assuming that the latter step is correct, the history of the views as to its generic position is briefly as follows:—

Jacquinot and Lucas had only a single much-damaged specimen, and could only suggest with much doubt that it was a Cleistostoma; affinities were also recognised with Macrophthalmamus. Heller, without recognition of the previous work, located it in Metaplex, but later founded the genus Hemiplax for it. Miers accepted this name, but later suggested that it might be regarded as a subgenus of Macrophthalmamus. Thomson has definitely located New Zealand specimens in Macrophthalmamus, though considering them to be different from Heller's species. Etheridge and McCullough have accepted the genus Hemiplax, and have added M. latifrons Haswell to it. We have retained the name Hemiplax.

As regards the specific name, the problem is whether the Cleistostoma hirtipes described by Jacquinot and Lucas from Samoa is the same as Hemiplax hirtipes described from Auckland by Heller. Although we have not seen the types, or specimens from Samoa, we have united the two, and the result is the new combination Hemiplax hirtipes (Jaq. and Lucas). If, however, the two are not identical, our species is Hemiplax hirtipes Heller.

The grounds on which Heller's species has hitherto been regarded as distinct consist chiefly of the smallness of the hands of the male, whereas in many specimens the hands are much enlarged. But Heller had only small specimens, and the same is true of Miers (1876) and Hutton (MS. and named specimens), at least as far as is definitely known. We have a large series from a great number of localities, and regard males with small hands as conspecific with large-handed males; the final shape and proportions are acquired, according to this view, at a late stage of development. There seems to be no other distinguishing feature, and both types are present in collections from the same locality. The only doubtful point, which may not carry any weight, is that one large male in our collection has a large hand and a small one, evidently the result of incomplete regeneration; and the small hand does not resemble the hand of females or small males,
but—except in size—the large hand of large males; which might possibly be interpreted to mean that the males with large and with small hands respectively belong to different species. But the course of development during regeneration is a matter on which experimental work is required, and incidentally we commend the problem to naturalists. If, however, the above interpretation be adopted without further evidence, where are the young males of the species with large hands?

There remains the statement by the Hon. G. M. Thomson (1902) that *Macrophthalmus hirtipes* Jacquinot and Lucas "has hitherto been confused with *Hemiplus hirtipes* Heller, a species from which it is quite distinct." He added, and repeated in 1913, that *Macrophthalmus hirtipes* is common in Otago. The two names were included as distinct species in the *Index Faunae N.Z.*, a view with which we disagree. We do so the more readily because in 1917 Mr. Thomson sent some specimens from Portobello to the senior author, and stated: "I am half inclined to think that this species [*Hemiplus hirtipes*] is only the young stage of *Macrophthalmus hirtipes*. . . . I have one crab labelled *Macrophthalmus hirtipes*, but it seems only a large form of those I have posted you." We have interpreted this as a retraction of the former view, and acquiesce therein.

In three of our largest males, including a pair from Akaroa, the hands are more elongated than is usual in large males, with longer and thinner fingers; and the upper edge of the movable finger makes a noticeably more acute angle with the upper edge of the palm. The difference is sufficient to distinguish a new species if it is found to be constant in a good series. The Akaroa specimens were taken among rocks on a mud-flat near high-water mark by the junior author in 1921; they were almost white in colour, and had brilliant reddish-brown spots which showed up much more conspicuously than those of the usual dark-coloured specimens, and might well be compared with those of the shrimp *Leander affinis*. Such colour-differences may perhaps be the result of recent ecdysis.

**Locality.**—Auckland Harbour (Heller).

New Zealand, Queen Charlotte Sound (Miers).
North, South, Stewart, and Campbell Islands (Filhol).
Sumner, Dunedin (Hutton, MSS.).
Ponui Island, Hauraki Gulf (G. F. Pirritt).
Wellington (Macleay Collection, Sydney).
Okarito Lagoon (C. E. Foweraker).
Stewart Island, Heathcote Estuary, Tauranga; mud flats and *Zostera* beds between tides (W. R. B. Oliver).

"Very common on sand-banks in Otago Harbour and shallow bays along the coast. It is an active and most aggressive species." (Thomson).

Otago Harbour (G. R. Marriner, etc).
Heathcote Estuary, Kaioura, etc., on mud flats and *Zostera* beds, with *Hemigrapsus crenulatus*, but not extending as far altitudinally. (C.C. and E.W.B.).

**Distribution.**—Endemic.
Uca huttoni (Filhol).


The familiar and long-used name *Gelassimus* must be replaced, as various authors have regretfully acknowledged, by Leach's earlier name *Uca*, of which it has proved to be a simple synonym (see Rathbun, *Proc. Biol. Soc. Washington*, vol. 11, p. 154, 1897; Ortmann, *Zool. Jahrb.*, vol. 10, pp. 335 and 346, 1897; Stebbing, *Marine Investig. in S. Afr.*, vol. 4, p. 39, 1905).

The whole genus requires revision, as demanded by Ortmann (l.c., p. 354) and Bouvier (*Bull. Sci. Fr. et Belg.*, vol. 48, fasc. 3, p. 123, 1915). Bouvier, for example, considers most of the characters used in determining the various species to be inadequate, especially those of the male hand, which are variable and do not take the female into account. Milne-Edwards has made use of two reliable characters, the relative width of the front and the granulous lines of the upper orbital edge, forming a supra-orbital space; Bouvier also draws attention to the outer orbital channel formed by the angle of the carapace and the lower orbital margin. More recently, Stebbing has characterized the genus in *Ann. Durban Mus.*, vol. 2, p. 15, 1917.

The validity of the two New Zealand species is not beyond doubt. If the desired revision of *Uca* shows a new genus to be necessary, Filhol's misspelling cannot be taken as a new name.

**Locality.**—Near Otago Harbour (Filhol; collected by Hutton).

**Distribution.**—Endemic.

**Type.**—Paris Museum.

Uca thomsoni (Kirk).


**Locality.**—Wellington (Kirk).—Filhol remarks, without any apparent grounds, that it appears to be common enough; but if so, it would no doubt have become familiar to local naturalists.

**Distribution.**—Endemic.

Heloeicus cordiformis (Milne-Edwards).


Heloeicus inornatus Dana, l.c., p. 248. 1851.

Heloeicus cordiformis Dana *U.S. Explor. Exped.*, vol. 13, Crust. 1, p. 320, Pl. 19, Fig. 6. 1852.

Heloeicus inornatus Dana, l.c., p. 321, Pl. 19, Fig. 7. 1852.


— Miers, Cat. Crust. N.Z., p. 35. 1876.
— Filhol, Mission de l'Île Campbell, p. 387. 1885.

We have not given the later synonymy of this crab, which probably does not occur in New Zealand. The record is one of those depending on Miers, and has been questioned by Hutton and struck off in his MS. We have seen nothing like it in collections of New Zealand Crustacea.

Locality.—N.Z. (Miers).

Distribution.—Not N.Z. ? (Hutton).

Epigrapsus politus Heller.

Nectograpus politus Heller, Voyage der Novara, Crust., p. 17. 1865.
— Miers, Challenger Reports, Zool., vol. 17, Crust., p. 266. 1886.

This species is recorded from New Zealand by Lenz; we have seen no specimens.

Locality.—French Pass (Lenz).

Pachygrapsus transversus Gibbes.


The last-named authors include New Zealand in their statement of the distribution of this crab, but the reference requires verification. The species is widely distributed in the warmer seas, especially the Atlantic, and is reported from Australia and Tahiti.

Grapsus grapsus (Linnaeus).

Grapsus pictus Miers, Cat. Crust. N.Z., p. 36. 1876.
Grapsus pictus Filhol, Mission de l'Île Campbell, p. 387. 1885.
— Lenz and Strunck, Deutsche Sudpolar Exped., Bd. 15, h. 3, p. 183. 1914.
— Rathbun, U.S. Nat. Mus. Bulletin No. 97, p. 227. Fig. 135. 1917.
Although this crab has an enormous distribution, and may very well occur in New Zealand, it is not typically a South West Pacific species. The records are not entirely convincing, and Hutton has proposed to exclude the species from the list; but it is included in the Index. There is a specimen from Kapiti Island in the Wanganui Museum labelled *Grapsus pictus*, but it is *Leptograpsus variegatus*.

**Locality.**—N.Z. (Miers).

Auckland Harbour (Filhol).

**Distribution.**—Tropical Indo-Pacific and Atlantic regions, abundant; the distribution is quite circumtropical (Ortmann).

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**Leptograpsus variegatus** (Fabricius).


— Guerin, *Icon. du Regne Animal*, Crust., Pl. 6, Fig. 1.


— Rathbun, *Proc. U.S. Nat. Mus.*, vol. 38, No. 1766, pp. 547, 588, Pl. 45, Fig. 2. 1910.


Miss Rathbun (i.e., 1910, p. 234) also quotes as synonyms the following names proposed by Milne-Edwards: *Leptograpsus ansoni*, *L. gayi*, *L. verreauxi*. The variability and the wide distribution of this crab account for the extensive bibliography.
A large male in our collections has the following dimensions:—

Length of carapace .... 58 mm.
Breadth of carapace .... 68 mm.
Length of arm .... 92 mm.
Length of hand .... 51 mm.
Breadth of hand .... 29 mm.

**Locality.**—N.Z. (Milne-Edwards, Filhol).
Bay of Islands (Borradaile).
Cuvier Island (Grenfell and Barr, G. E. Archey).
Bay of Islands, North coast of Mahia Peninsula, Slippery Island (G. E. Archey).
Portland Island, Hawke's Bay (C. Riesop).
Cape Maria van Diemen (T. B. Smith).
Eastern Chicken Island, Auckland (C.C.).
Kapiti Island (Wanganui Museum).
Castlecliff (E.W.B.).
Common on shores of the North Island, one of the most active of our shore crabs.

**Distribution.**—Kermadee Islands (Hutton, Oliver), Australia, Norfolk Island, Marianne Islands, Shanghai, Chili, Peru, St. Ambrose Islands, Juan Fernandez, Pernambuco, etc.

**Hemigrapsus sexdentatus** (Milne-Edwards).


— White, Dieffenbach's _New Zealand_, vol. 2, p. 266. 1843.

_Hemigrapsus sexdentatus_ Dana, _U.S. Explor. Exped._, Crust., 1, p. 345, Pl. 22, Fig. 2. 1852.


Filhol has described the way in which the colour spreads as growth proceeds. In addition to these differences due to age, there is considerable variation in the colouring, and specimens may be classified roughly as light or dark. The lighter ones have either a grey or a cream-coloured background with markings of light or dark chestnut-red; those of the other series are marked with a dark purple, showing a violet blush, this colour being sometimes intensified on the carapace to a purplish black. In the darker series, the legs are usually transversely banded with broad areas of grey, chiefly—though not exclusively—around the joints. In large specimens the colour may be
extended over the whole carapace, but usually the front half is more deeply pigmented than the posterior; the merus and upper surface of the hand are of the same rich colour as the adjacent parts of the carapace.

The edge of the carapace is raised into a low ridge, which is lightly granulated all round, except along the posterior edge. The carapace is faintly granulated, especially antero-laterally; the hands are microscopically granulated; the subhepatic region is shortly pubescent; the last joint of each walking-leg has two grooves and the penultimate one groove on each surface. This sculpture is not prominent, and the crab is remarkably smooth all over.

The palm is much enlarged in the male. The fingers are comparatively thin, especially the movable one, which is also longer and slightly curved. The teeth are regular, decreasing in size towards the tip, low and flatly rounded. The wide gape at the base of the fingers is mostly filled by a large membranous pad. The fingers are sharply pointed, and tipped with brown. In the hand of the female, a faint ridge runs along the palm along the outer surface to the tip of the fixed finger, as for example in *Leptograpsus*.

The female abdomen is very large, circular, last segment rounded-trigonal; eggs extremely numerous, 0.5 mm. in diameter.

The order of size for the four pairs of walking-legs is:—2nd, 3rd, 1st, 4th. The male arm is longer than any, the female equal to the fifth pair.

This species, though found everywhere, is less numerous than some of the gregarious species, and is far from being the most abundant species of Crustacea, as Filhol claimed. It may be said to be the most conspicuous crab among intertidal rocks.

As indicated in the following measurements, the relative width of the carapace is variable:

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of carapace</td>
<td>33 mm.</td>
<td>47 mm.</td>
</tr>
<tr>
<td>Breadth of carapace</td>
<td>44 mm.</td>
<td>57 mm.</td>
</tr>
<tr>
<td>Length of arm</td>
<td>42 mm.</td>
<td>90 mm.</td>
</tr>
<tr>
<td>Length of hand</td>
<td>22 mm.</td>
<td>60 mm.</td>
</tr>
<tr>
<td>Breadth of hand</td>
<td>11 mm.</td>
<td>31 mm.</td>
</tr>
</tbody>
</table>

As regards the distribution, a letter from the late A. R. McCulloch, of the Australian Museum, states: "This species appears to have been first recorded from Australia by Haswell, who included New South Wales and Victoria in its habitat, though he placed a ? after each. Four specimens are in the Australian Museum labelled "*Heterograpsus sexdentatus*, New South Wales ?" which are doubtless some of those on which the records are based, but they are incorrectly identified, being *Chasmagnathus laevis*, to which *H. sexdentatus* bears some resemblance.

"No Victorian specimens are included in the collections of either the Australian Museum or the Macleay Museum, nor was it obtained by the late Mr. F. E. Grant, who collected in many parts of Port Phillip; the species was also omitted from the Census of Victorian Decapod Crustacea by Fulton and Grant. The records of *H. sexdentatus* from Australia may therefore, I think, be regarded as incorrect."
Transactions.

Auckland Harbour to Stewart Island, abundant; not at Campbell Island (Filhol).
Rangitoto, rocks and mud (W. R. B. Oliver, T.N.Z.I. 54, 542).
Bay of Islands (Dana, G. E. Archey).
Puysegur Point (J. Pottinger, T. B. Smith).
Cape Campbell (G. F. Pirrit).
Wellington (Hutton).
French Pass (Lenz).
Robin Hood Bay, Marlborough (G. Bigg-Wither).
Otago Harbour (G. R. Marriner).
Ponui Island (W. J. Barr).
Auckland (H. Suter).
Stewart Island (A. W. Parrott).
"An extremely common shore crab, occurring between tide marks, usually under stones (Otago)." (Thomson).
Waitangi, Onehunga, Lyttelton, Heathcote, Akaroa, Port Chalmers, etc. (C.C.).
Auckland; Lyttelton, Sumner, Governor’s Bay, Oha-hoa Bay, etc.—all round Banks’ Peninsula; Kaukoua; intertidal pools, among loose rock, and especially under stones on sandy beaches, often with H. crenulatus (E.W.B.).

Distribution.—Endemic.

Hemigrapsus crenulatus (Milne-Edwards).

Hemigrapsus crenulatus Dana, U.S. Explor. Exped., vol. 13, Crust., pt. 1, p. 349. 1852; and Atlas, Pl. 22, Fig. 3. 1855.
Heterograpsus barbimanus Heller, Voyage der Novara, Crust., p. 53, Pl. 4, Fig. 5. 1865.
Heterograpsus crenulatus Miers, Cat. Crust. N.Z., p. 38. 1876.

This species is distinguished from H. sexdentatus by the smaller size, the hairs on the legs, the "barbimanus" condition of the hand of the male, etc. It is much less handsome, and the colours much
duller. It is commonly of an ochreous shade, with reddish-brown spots on the upper surface of the carapace and limbs. Usually the spots are prominent and almost continuous, especially on the carapace; they are then of a deeper shade, varying from red and brown to dark purple, and such specimens have large reddish spots across the top of the hand and the movable finger, and sometimes also the movable finger. The outer surface of the hands is a deep yellowish cream, and the hairs on the legs are coloured a very pale raw umber.

The orbits and lateral teeth vary somewhat in shape. The back is more rounded in the female, the gastric region especially being raised. There is no doubt that Miers was correct in uniting Heller’s *H. barbimanus* with this species. The males are much larger than the females, and have enlarged equal hands. Specimens from *Zostera* beds at Akaroa have filamentous algae (*Enteromorpha?*) on the legs; as in the masking crabs, it is the pilose regions which are affected by the algae. The line on the hand, referred to in the case of *H. sexdentatus*, is present, and more prominent; it is granulated, and sometimes accompanied by rows of punctuations along the fixed finger.

Differences from *H. sexdentatus* have already been noted; the species may also be distinguished from the superficially similar crabs *Hemiplus hirtipes* and *Helice cressa* (which are also mud-burrowers, and are correspondingly coloured), by the shape of the orbits, which are short and rounded, and not continued to the side of the carapace, as in the species named. The three lateral teeth at once distinguish it from *Planes minutus* and from *Cyclograpsus lavauxi*.

The dimensions of the largest male and of the largest female in our collections are as follows:—

<table>
<thead>
<tr>
<th>Character</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of carapace</td>
<td>27 mm.</td>
<td>22 mm.</td>
</tr>
<tr>
<td>Breadth of carapace</td>
<td>32</td>
<td>25</td>
</tr>
<tr>
<td>Length of arm</td>
<td>42</td>
<td>23</td>
</tr>
<tr>
<td>Length of hand</td>
<td>24</td>
<td>11</td>
</tr>
<tr>
<td>Breadth of hand</td>
<td>12</td>
<td>5.5</td>
</tr>
</tbody>
</table>

The habits of this crab require more detailed study. In the Heathcote Estuary, for example, it burrows in the mud flats, and also along clay banks; at Kaikoura it is common under fragments of rock, where the substratum is too stiff for the crab to be able to burrow; at Sumner, large specimens occur with *H. sexdentatus* under rocks on a sandy beach; at Taylor’s Mistake it occurs in rock pools on a reef where there is no sand or mud and no opportunity of burrowing; at Kairaki Beach, at the mouth of the Waimakariri River, it burrows in stiff sand well above high-water mark. In the latter case it is half a mile from the sea, and some hundreds of yards from the river; and the burrows do not extend down to the level of the water. It is interesting to note that such diverse habits should be exhibited by a single species.

The distribution of this species suggests a link with South America; but according to Ortmann it is also closely related to *H. erythraeus* (Kossmann) from the Red Sea.
Localities.—N.Z. (Miers; Macleay Collection).
Bay of Islands (Dana).
Very abundant on all coasts, including Setwart Island
(Filhol).
Under stones between tidemarks, but not very com-
mon (Otago). (Thomson).
Sumner (Hutton).
Heathcote Estuary (W. R. B. Oliver, etc.).
Auckland Harbour (H. Suter, W. R. B. Oliver).
Ponui Island (W. J. Barr).
Port Chalmers (C.C.) and Dunedin (Thomson); iden-
tified by Rathbun (1917).
Okarito, Westland (C. E. Foweraker).
Puysgur Point (T. B. Smith).
Otago Harbour (G. Marriner).
Stewart Island (A. W. Parrott).
Lyttelton, Heathcote, Akaroa, Port Chalmers, Wai-
tangi Beach, Onehunga, Hokiaanga (mangrove swamp
at Rawene) (C.C.).
Auckland Harbour, Castlecliff, Akaroa, Kaikoura,
Banks' Peninsula, Kairaki, etc. (E.W.B.).

Distribution.—Chili, west coast of Patagonia.

Hemigrapsus maculatus (Milne-Edwards).

20, p. 193. 1853.
—Filhol, Mission de l'Ile Campbell, p. 389. 1885.

The occurrence of this species in New Zealand is very doubtful.
We cannot separate the crabs which we have called H. sexden-
tatus into two species, though two main types of coloration have been
described above. The S-shaped line of small pits, separating the epi-
and meso-branchial lobes, may be made out, but they are not distinct,
as Milne-Edwards stated to be the case in H. maculatus.

The species is excluded from our fauna by Hutton in his earlier
critical list; it is queried but not struck out in his manuscript, and
retained in the Index Faunae N.Z., no doubt or Filhol's authority.
There are specimens labelled H. maculatus in the Macleay Museum,
and we have seen nothing like these in any collections of New Zea-
land Crustacea. Filhol, however, has distinguished the species from
H. sexdentatus, and has stated that it occurs from Auckland to
Foveaux Straits—that is, it is coextensive with the other two species.
As for the distribution, Polynesia has been mentioned, but has been
queried by Haswell.

Planes minutus (Linnaeus).

1852.
Chilton—Bennett.—Revision of Crustacea Brachyura of N.Z. 769

Filhol, Mission de l’île Campbell, p. 390. 1885.

In New Zealand, apart from a doubtful record by Miers, only one specimen has yet been found. It would be extraordinary if the species did not turn up in our waters, even if only occasionally, for it occurs in all seas, especially the Atlantic, clinging to floating objects, such as seaweed, wood, cuttle-fish pens, etc.; on account of its abundance in the Sargassum areas it is commonly known as the "gulfweed crab."

Locality.—N.Z. (Miers).
Moko Hinau; a single specimen, washed ashore on a piece of pumice (C. R. Gow).

Distribution.—Throughout tropical and temperate seas.

Cyclograpsus whitei Milne-Edwards.

Filhol, Mission de l’île Campbell, p. 391. 1885.
Cyclograpsus lavauzi (part) Miers, Cat. Crust. N.Z., p. 41. 1876.

This species was very briefly characterized by Milne-Edwards, and disallowed by Miers, who (without seeing specimens) suggested that it was only a variety of C. lavauzi. Filhol has admitted the validity of the species by stating that specimens are in the Paris Museum, for he had access to the collections there; but he has shown such deference to the determinations of Milne-Edwards that this is hardly an additional argument in favour of the validity of the species. It is therefore satisfactory to be able to decide quite definitely upon this point, from a study of our own specimens.

C. whitei is a valid species, and the distinctive characters may be conveniently stated in the form of a comparison with the commoner species.

<table>
<thead>
<tr>
<th>Regions</th>
<th>C. lavauzi.</th>
<th>C. whitei.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front</td>
<td>Regions defined; front with longitudinal furrow.</td>
<td>Regions not defined; carapace quite smooth except for faint transverse groove in gastric region.</td>
</tr>
<tr>
<td></td>
<td>Strongly depressed</td>
<td>Still more depressed; at right angles to carapace.</td>
</tr>
<tr>
<td>Carapace</td>
<td>Length 16 mm., breadth 21 mm., ratio 1:1.3 (somewhat variable). Sometimes broader in front than posteriorly, especially in female, but also variable.</td>
<td>Length 18.5 mm., breadth 22 mm., ratio 1:1.2; slightly narrower in front than posteriorly.</td>
</tr>
<tr>
<td>Edge of carapace</td>
<td>Finely granulated.</td>
<td>Smooth.</td>
</tr>
<tr>
<td>Orbits</td>
<td>C. lavauxi.</td>
<td>C. whitei.</td>
</tr>
<tr>
<td>-------------</td>
<td>------------------------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td></td>
<td>Small but well incised; outer</td>
<td>Very small; not forming a</td>
</tr>
<tr>
<td></td>
<td>corner raised to a point.</td>
<td>raised point at the outer</td>
</tr>
<tr>
<td>Third joint</td>
<td>Subquadrate; length scarcely</td>
<td>Elongate, length nearly 1(\frac{1}{2})</td>
</tr>
<tr>
<td>of external</td>
<td>exceeding breadth; distal</td>
<td>times breadth; distal end</td>
</tr>
<tr>
<td>maxillipeds</td>
<td>end truncate.</td>
<td>distinctly produced on inner</td>
</tr>
<tr>
<td>Legs</td>
<td>Slender, compressed.</td>
<td>Robust, very slightly com-</td>
</tr>
<tr>
<td>Tarsi</td>
<td>Long, slender, with six lines</td>
<td>pressed.</td>
</tr>
<tr>
<td></td>
<td>of short and very dark</td>
<td></td>
</tr>
<tr>
<td></td>
<td>hairs running whole length</td>
<td></td>
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<tr>
<td></td>
<td>of tarsus.</td>
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Of these characters, those relating to the orbits, maxillipeds, and tarsi are the most distinctive. There are other differences besides the above; thus in the ambulatory legs, the longitudinal ridge on the front and hinder surfaces of the last three joints are less distinct than in the case of C. lavauxi; and the same applies to the granulated ridge on the upper edge of the merus of the same limbs. The penultimate joint of the male abdomen is not as swollen as in C. lavauxi. The arm of the female has a few long hairs on the anterior edge of the carpus and merus. The dimensions of the tarsi may be indicated from those of the last pair of legs; in C. whitei, the length of the tarsus is equal to the breadth of the merus, but in C. lavauxi the ratio is 1\(\frac{1}{2}\) (Filhol’s figure is inaccurate in this respect).

The fingers of the hand of the female leave only a small gap when closed; they are regularly and prominently denticulate. The hands of the male are larger, and the fingers leave a wide gap at the base; they are sometimes denticulated as in the female (3 of our specimens), but usually the teeth are obsolete (4) or absent (5).

Neither species is “entirely destitute of hairs,” as Miers states. There are short but distinct hairs on the edges of the abdomen and sternum, especially in the female, on the maxillipeds (densely at the base), and over the whole pterygostomial and subhepatic regions.

**Locality.**—N.Z. (Miers).

Our New Zealand specimens were placed in a jar containing C. lavauxi before it was noticed that the two species were distinct, so that the locality or localities are not known; but from MSS. notes we infer that our specimens came from one of the last five localities quoted under C. lavauxi.

**Distribution.**—Kermadees (Chilton, l.c.).

*Cyclograpsus lavauxi* Milne-Edwards.

*Cyclograpsus andouinii* Dana, *U.S. Expl. Exped.*, vol. 13, Crust., pt. 1, p. 359, Pl. 23, Fig. 2. 1852. (Not of Milne-Edwards).


The diameter of the eggs is only 0.2 mm. A pair of specimens of this crab were taken in copula on Nov. 28, 1927, beneath a pile of intertidal rocks near Godley Heads. They were not in the water, and their presence was first detected by clicking sounds made by rapid movements of the mouthparts, almost like distant artillery. When unearthed, they were found to be "frothing at the mouth," as many Grapsoid crabs do when imprisoned in a bottle.

Filhol remarks that his specimens from Stewart Island appear to be smaller than those from Cook Strait and Auckland. Some details concerning the species have been given above, under C. whitei. Ortmann (i.e., both references) has quoted C. punctatus Milne-Edwards from New Zealand. This is not a new record, as he identifies C. lavauxi Milne-Edwards and C. andouini Milne-Edwards with that species. Lenz and Strunck (i.e.) have disagreed with this conclusion.

Locality.—N.Z. (Milne-Edwards, Miers).
Fairly common, from the extreme north to the extreme south (Filhol).
Portland Island, Bay of Islands, Lyttelton Harbour (G.E. Archey).
Sumner (Hutton).
Common in Otago under stones between tide marks (Thomson).
Common in Queen Charlotte Sound, Picton, etc.; many specimens collected all round the coast of Auckland; Moko Hinau, Hen and Chickens, etc. (C.C.).
Kaikoura, abundant among rock debris; Sumner, common among stones; Taylor's Mistake, Godley Heads, Lyttelton Harbour; Castlecliff (E.W.B.).
Portland Island (C. Riesop).
Stephens Island (T. B. Smith).
Akaroa (C.C.).
Robin Hood Bay, Marlborough (G. Bigg-Wither).
Dunedin (G. Marriner).

Distribution.—Australia.

Chasmagnathus subquadratus Dana.

— Miers, Cat. Crust. N.Z., p. 42. 1876.
— Filhol, Mission de l'Ile Campbell, p. 391. 1885.

Hutton has queried the occurrence of this crab in New Zealand, and it is not known in New Zealand.
Transactions.

Chasmagnathus laevis Dana.

*Chasmagnathus laevis* Dana, *U.S. Explor. Exped.*, vol. 3, Crust., pt. 1, p. 365, Pl. 23, Fig. 7. 1852.


This species depends on Miers' record, and, like the last, has been queried by Hutton.

*Distribution.*—Australia.

Helice crassa Dana.


The third lateral emargination is often obsolete.

The resemblance of this species to *Hemiplax hirtipes*, though superficial, is remarkable; but the legs never have the long hairs possessed by that species, and the oblique crest on the external maxillipeds is fundamental and decisive.

See the note on the next species.

*Locality.*—N.Z. (Miers; Macleay Collection).

Auckland (Heller).

Sumner, Otaki (Hutton).


Rangitoto, Waipara Beach (G. E. Archey).

Otago Harbour (G. R. Marriner).

Westland (J. W. Hende).

Waitangi Beach; mangrove swamp, Hokianga; Stewart Island; Heathcote Estuary; Onehunga, mudflats (C.C.).

Heathcote Estuary, mud flats; Sumner, under stones on sandy beach; Kairaki Beach, burrowing in hard sand above high-water mark; common (E.W.B.).

*Distribution.*—Australia.
Helice lucasi Milne-Edwards.

— Miers, Cat. Crust. N.Z., p. 44. 1876.

We have not recognised this crab among our specimens of Helice, but have identified them all with H. crassa. The latter species was recorded from New Zealand by Heller and Miers, and though neither of these authors is reliable as regards localities, New Zealand workers have recognized H. crassa only. Yet Filhol did not record the latter, but reported H. lucasi to be abundant and wide-ranging. There is evidently some confusion, which we have been unable to clear up without seeing Dana’s description of H. crassa. Filhol quotes several differences. If the two are synonymous, the name H. crassa has precedence.

Locality.—N.Z. (Milne-Edwards).
Cook Strait to Stewart Island; abundant at the Bluff (Filhol).

Distribution.—Endemic.

Sesarma catenata Ortmann.

Sesarma catenata Ortmann Zool. Jahrb., vol. 10, p. 334, Pl. 17, Fig. 9. 1897.
Sesarma catenatum Stebbing, Marine Investig. S. Afr., vol. 4, p. 44. 1905.

Ortmann quotes New Zealand as the locality from which his specimen was received, but adds the warning that this is by no means beyond doubt. As Stebbing has since recorded the species from South Africa, the suggested locality is almost certainly incorrect.

Sesarma pentagona Hutton.

— Miers, Cat. Crust. N.Z., p. 44. 1876.
— Filhol, Mission de l’Ile Campbell, p. 393. 1885.

The inclusion of this crab in the New Zealand fauna rests on the specimen in the Wellington Museum described by Captain Hutton. Thomson (1913, p. 238) says there is a specimen labelled in Captain Hutton’s handwriting in the Otago Museum but he has not come across the species elsewhere, nor have we. Miers says it is near S. tetragona Edw. and may be identical with it or one of the allied species. Its existence as a distinct species is therefore doubtful.
Percnon planissimum (Herbst).

_Cancer planissimus_ Herbst, _Natur. d. Krabben u. Krebse_, vol. 3, pt. 4, p. 3, Pl. 59, Fig. 3. 1804.

_Leiolophus planissimus_ Miers, _Cat. Crust. N.Z._, p. 46. 1876.


Many other references to this widely-spread and well-known species might be given. Miss Rathbun (l.c.) gives the following synonymy among the earlier literature:—_Cancer planipes_ Seba, _Grapsus diris_ Costa, _G. testudinum_ Roux, _Ocypride (Acanthopus) clavimana_ de Haan, _O. (A.) serripes_ de Haan. The generic name is scarcely more fortunate, and Miers’ name _Leiolophus_ (which was proposed because de Haan’s _Acanthopus_ was preoccupied) must yield to _Percnon Gistel_ 1898 (see Rathbun, l. c.).

In appearance, the crab resembles _Plagusia_, but is much depressed and has long legs.

Although Hutton included this species in his list of Crustacea which should probably be excluded from the New Zealand fauna, he has crossed the name off the list in his copy of the paper in question. We have apparently his authority for its occurrence here.

_Locality._—N.Z. (Miers, Hutton MS.).

_Distribution._—All warm seas.

Plagusia chabrus (Linnaeus).

_Plagusia capensis_ de Haan, _Fauna Jap._, _Crust._, p. 58. 1835.
— Miers, _Challenger Reports_, _Zool._, vol. 17, _Crust._, p. 273, Pl. 22, Fig. 1d. 1886.
Locality.—Wellington, Cape Campbell (Hutton).
Cape Strait, Otago, Kapiti Island (Filhol).
Lyttelton (Hutton, G. E. Archey, C.C.).
Cuvier Island (Grenfell and Barr).
French Pass, Napier (Lenz).
Kaikoura, Lyttelton (E.W.B.).
Napier; Portland Island; frequently seen in rock pools
at low tide at Slipper Island and other Auckland
localities during the “Hinemoa” trip, 1914-15, but
it is very active and alert and was very difficult to
catch. (C.C.).

Distribution.—Chili, Juan Fernandez, Tongatabu, South Africa,
Australia, Tasmania, Kermadec Islands, Lord Howe
Island, Norfolk Island.

Calappa hepatica (Linnaeus).

Calappa tuberculosa Guerin, Icon. R.A., Crust., Pl. 12, Fig. 2.
Calappa hepatica de Haan, Fauna japonica, Crust., p. 70. 1883.
— Borradale, P.Z.S. for 1900, p. 572. 1900.

Ortmann (1894) included New Zealand in his account of the
distribution, but the reference requires verification.

Pinnotheres.

The pea-crabs, commensal with various Pelecypoda (Mytilus,
Maetra, SPisula, Atrina) are common in New Zealand, and our
collections contain specimens from many localities. We have not revised
the genus in the present paper, and merely note that the following
have been recorded from New Zealand:—

Pinnotheres pismum Linnaeus.
Pinnotheres novae-zealandiae Filhol.
Pinnotheres schauinslandi Lenz.

This is by no means a satisfactory list. P. pismum, for example,
is the European species and is probably correctly identified, but
various writers (Heller, Miers, Filhol) who have identified New Zea-
land specimens with that species have commented on the identity of
the New Zealand mussel in which it lives, with the European mussel
Mytilus edulis, but as a matter of fact our mussel has been mas-
querrading under a wrong name, and is Mytilus planulatus Lamarck,
quite distinct from the European species (W. K. B., Oliver, “Notes
Again, Pinnotheres schauinslandi was described by Lenz (Zool.
Jahrb., vol. 14, p. 468, 1901) from two specimens of which we do not
even know the sex, and the validity of the species has already been
questioned by the senior author (Chilton, Rec. Cant. Mus., vol. 1, part 2, p. 295, 1911). Pinnotherees novae-zealandiae appears to be a valid species, and has recently been recorded from Australia by Miss Rathbun (Sci. Results “Endeavour” Exped., p. 98, Pl. 16, Fig. 2, and text Fig. 2, 1923). Gurney has recorded Zoeae stages of a Pinnotherees from North Cape and Bay of Islands (Brit. Ant. Exped., Zool., vol. 8, p. 195, 1924), but his identification with P. pisum is probably only a guess.

Halicarcinus, etc.

The remainder of the crabs recorded from New Zealand but not discussed above are all small, the carapace rarely if ever exceeding an inch in length or breadth. Some species are common and widely distributed, especially Halicarcinus planatus. This species may be taken as a type of the algae-frequenting forms, which are comparatively active, while Hymenicus pubescens is an example of those found under stones and in crevices. The latter species is covered with grey hairs, and very inconspicuous, especially as it is minute, and clings motionless to the rock; and, as might be expected in such small and defenceless creatures, there are several other examples of protective colours and habits. Hymenosoma lacustris is especially interesting in that it is the only fresh-water crab in New Zealand.

In the following list, a few bibliographical references are added which are of special value, or which might be passed over in compiling a bibliography; other references will be found in the works referred to under other species. The query after Elamena whitei indicates that the species has been challenged.

Halicarcinus planatus Fabricius.
Halicarcinus tridentatus Jaquinot and Lucas, Voyage au Pol Sud, Zool., vol. 3, p. 60, Pl. 5, Fig. 27. 1853.
Hymenicus varius Dana, Miers, Cat. N.Z. Crust., p. 50.
Hymenicus pubescens Dana, Miers, l.c., p. 51.
Hymenicus edwardsi Filhol, l.c., 400.
Hymenicus cooki Filhol, l.c., p. 401.
Hymenicus haasti Filhol, l.c., p. 402.
Hymenicus marmoratus Chilton (=? H. varius Dana).
Hymenosoma depressum Jaquinot and Lucas.
Elamena quoyi Milne-Edwards.
Elamena whitei Miers (†).
Elamena longirostris Filhol, l.c., p. 403.
Chilton-Bennett.—Revision of Crustacea Brachyura of N.Z. 777


Elamena producta Kirk.

Ebalia laevis Bell.


Ebalia cheesemani (Filhol), l.c., p. 407.

Ebalia tumefacta Mont, Filhol, l.c., p. 407.

Ebalia tuberculosa Milne-Edwards.


— Ortmann in Bronn's Thierreich, Bd. 5, abt. 2, p. 120, Fig. 10. 1899.

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### Key to Code Letters in Index—

- **a.** Authentic New Zealand species.
- **b.** Probably true species occurring in New Zealand, but not endemic.
- **c.** Species of doubtful authenticity.
- **d.** Foreign species perhaps not occurring in New Zealand.
- **e.** Foreign species almost certainly not occurring in New Zealand.
- **f.** Endemic.
- **g.** Endemic species known from original description only.