

II. *On the Marine Copepoda of New Zealand.*By G. STEWARDSON BRADY, *M.D., D.Sc., LL.D., F.R.S., C.M.Z.S.*

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## [PLATES IX.—XIII.]

IN this paper I complete, so far as possible, an account of two collections of New Zealand Entomostraca submitted to me by Mr. G. M. Thomson of Dunedin, and Drs. Meinert and H. J. Hansen of Copenhagen. A former contribution (already published in the 'Transactions' of this Society, vol. xiv. p. 429) deals with the Ostracoda; the present paper refers to the Copepoda. It is rather remarkable that no Cladocera were noticed in any of the numerous gatherings represented in these collections, and it is also unfortunate that of some of the most interesting species only one or two imperfect examples were found,—in some cases so extremely imperfect that I have made no attempt to describe or figure them. In some other cases of specimens preserved in picric acid, the opacity and extreme brittleness of the subjects made dissection very difficult, and recognition of anything beyond the coarser external features quite impossible. The collections were made for the most part by means of the tow-net at the surface and down to a depth of 6–8 fathoms; a few were from littoral algæ. Not much systematic investigation of the marine microzoa of New Zealand appears hitherto to have been made; for the work already done we are indebted chiefly to Mr. G. M. Thomson, who has published papers on the Ostracoda and Copepoda in the 'Transactions' of the New Zealand Institute. There can be no doubt that a rich harvest awaits any observer who may be able to devote time and labour to the task.

The memoirs quoted in this paper are as follows. They are indicated in the synonymy by the numbers assigned to them in the list:—

- BOECK, AXEL. (1).—Oversigt over de ved Norges Kyster iagttagne Copepoder henhørende til Calanidernes, Cyclopidernes og Harpactidernes Familier. (Vidensk.-Selskabs Forhandling, 1864.)
- BRADY, G. S. (1).—A Monograph of the free and semi-parasitic Copepoda of the British Islands. (Ray Society, 1878–80.)
- „ (2).—Report on the Copepoda collected by H.M.S. 'Challenger' during the years 1873–76. (1883.)
- „ (3).—Description of a new Species of *Cyclops*. (Sixth Annual Report of the Fishery Board for Scotland.) 1888.
- „ (4).—A Revision of the British Species of Freshwater Cyclopidæ and Calanidæ. (Natural History Transactions of Northumberland, Durham, and Newcastle-upon-Tyne, vol. xi.) 1891.

- CLAUS, C. (1).—Die frei lebenden Copepoden, mit besonderer Berücksichtigung der Fauna Deutschlands, der Nordsee und des Mittelmeeres. Leipzig, 1863.
- DANA, J. D. (1).—American Journal of Science, vol. viii. (1849).
- „ (2).—Crustacea of the United States Exploring Expedition (1852).
- GIESBRECHT, W. (1).—Systematik und Faunistik der pelagischen Copepoden des Golfes von Neapel und der angrenzenden Meeres-abschnitte. Berlin, 1892.
- KRÄMER, A. (1).—On the most frequent Pelagic Copepoda and Cladocera of the Hauraki Gulf. (Transactions and Proceedings of the New Zealand Institute, 1894, vol. xxvii.)
- LUBBOCK, J. (1).—On two new Subgenera of Calanidæ. (Annals & Magazine of Natural History, March, 1853.)
- SCOTT, THOMAS (1).—Report on Entomostraca from the Gulf of Guinea, collected by John Rattray, B.Sc. (Transactions of the Linnean Society of London, 2nd ser. Zool. vol. vi. January, 1894.)
- THOMSON, G. M. (1).—On the New Zealand Copepoda. (Transactions and Proceedings of the New Zealand Institute, vol. xv.) 1882.

Section I. *GNATHOSTOMA* Thorell.

Family CALANIDÆ.

Genus CALANUS Leach.

1. CALANUS FINMARCHICUS (Günner).

Taken in the surface-net, Otago Harbour.

Genus PARACALANUS Boeck.

1. PARACALANUS PARVUS (Claus). (Plate IX. figs. 1, 2.)

In the surface-net, Otago Harbour and Port Chalmers; Hauraki Gulf (*Dr. Krämer*).

Genus CLAUSOCALANUS Giesbrecht.

1. CLAUSOCALANUS ARCUICORNIS (Dana).

1849. *Calanus arcuicornis* Dana (1).

1852. *Calanus arcuicornis* Dana (2), p. 1056, pl. lxxii. figs. 7 a, b.

1892. *Clausocalanus arcuicornis* Giesbrecht (1), pp. 185, 193, pl. i. fig. 14, pl. x. figs. 1-19, pl. xxxvi. figs. 29-31.

1894. *Clausocalanus arcuicornis* Scott (1), p. 73, pl. viii. figs. 38-47.

Taken in the surface-net, Port Chalmers. Recorded also by *Dr. Krämer* from the Hauraki Gulf.

This species has been sufficiently figured by Giesbrecht and Scott (*loc. cit.*).

2. CLAUSOCALANUS FURCATUS (G. S. Brady). (Plate IX. figs. 3-7.)

1883. *Drepanopus furcatus* G. S. Brady (2), p. 77, pl. iv. figs. 1, 2, pl. xxiv. figs. 12-15.

1892. *Clausocalanus furcatus* Giesbrecht (1), p. 194, pl. xxxvi. figs. 32, 33, 35.

The genus *Drepanopus* which, as proposed by the present writer, included two species, *D. furcatus* and *D. pectinatus*, has been divided by Dr. Giesbrecht into two genera—*Drepanopus* and *Clausocalanus*, to the latter of which *D. furcatus* is transferred. The original description dealt with females only, no males having been observed in the 'Challenger' collections. I therefore give here figures of some of the more important diagnostic structures. In some of the New Zealand gatherings both of these species occur together, and when associated with *C. arcuicornis* and *Paracalanus parvus* in various stages of growth it becomes by no means an easy matter to separate them. The most conspicuous characters are to be found in the fusions of the antennal joints, the relative lengths of the abdominal segments, and in the structure of the fifth pair of feet in both sexes.

The anterior antennæ of the female in *C. furcatus* reach somewhat beyond the extremity of the cephalothorax and are 24-jointed, having all the joints perfectly distinct; in the male (fig. 5) the first and second joints are coalescent, so also are the eighth, ninth, and tenth; all the rest are distinct. The fifth pair of feet in the female (fig. 4) are very short, two-jointed and alike on both sides; in the male (fig. 7) the foot of the right side is five-jointed, and about half as long as the abdomen (considerably shorter than in *C. arcuicornis*), that of the left side is two-jointed and only as long as the first joint of the right foot. The abdomen is four-jointed in both sexes (figs. 3, 7), the first segment being very short, the remaining segments nearly equal in the female, while in the male the third is rather reduced and the fourth rather increased in length.

*Hab.* Taken plentifully in the surface-net in Otago Harbour and at Port Chalmers, and in the net at 7 fathoms off Gisborne.

#### Genus ACARTIA Dana.

##### 1. ACARTIA ENSIFERA, sp. nov. (Plate IX. figs. 8–15.)

*Female.*—Seen from above (fig. 8) the cephalothorax is elongated, slightly narrowed towards the front, which is rounded but obscurely angulated in the middle, posterior angles rounded off and entirely without spines; rostrum obtuse, not furcate; abdomen about one-third as long as the cephalothorax (fig. 9), composed of three segments, first segment very wide in the adult and equal to the united lengths of the second and third segments; caudal stylets slender, more than twice as long as broad, longer than either of the two preceding segments. The antennules reach slightly beyond the posterior extremity of the cephalothorax. Fifth pair of feet (fig. 10) two-jointed, basal joint broad, quadrate, its outer margin prominent and mucronate in the middle, whence arises a single very long seta; second joint bulbous at the base and tapering to a long setiform apex. Terminal spines of the swimming-feet (fig. 11) very slender and sword-shaped, with finely pectinate margins. Length 1.2 millim.

*Male*.—Abdomen composed of four segments (fig. 14), the first very short, second twice as long, third and fourth rather shorter; caudal stylets rather longer than the preceding segment. Antennules more nodose than in the female owing to the distal dilatation of many of the joints (figs. 12, 13), some of which are more or less distinctly coalescent. The fifth foot of the right side is longer than that of the left (fig. 15); the inner margins of the first and second joints have large lobose protuberances, and the last joint is bent upon itself at a right angle, ending in a sharp point; on the left side the first joint is broad and quadrangular and has a long seta attached to its angulated outer margin; second joint rather longer and narrower, third dilated at the base and bearing on the inner margin of the narrowed distal extremity three small setiform laminae.

*Hab.* Plentiful in surface gatherings from Otago Harbour, Port Chalmers, Bay of Islands, and Napier; also in the net at a depth of 7 fathoms off Gisborne. These gatherings consisted almost entirely of females, males being extremely rare; almost all had attached spermatophores.

A form described in the 'Challenger' Report under the name of *Acartia denticornis* is very nearly allied to this species, but the antennules of *A. ensifera* possess no well-marked teeth, though these are constantly present in both sexes of *A. denticornis*. The antennules in *A. denticornis* are fully as long as the animal itself, while in *A. ensifera* they reach scarcely further than the extremity of the cephalothorax. The peculiar enlargement of the first segment of the abdomen in the female *A. ensifera* is likewise characteristic.

#### Genus TEMORA Baird.

##### 1. TEMORA TENUICAUDA, sp. nov. (Plate IX. figs. 16-23.)

*Female*.—Cephalothorax robust, width great in proportion to the length (fig. 16), broadly rounded in front, abruptly narrowed behind; angles of the posterior extremity rounded off, not at all produced or spinous. Abdomen short, four-jointed, first segment about twice as long as either of the following three, and in the adult having a pouch-like process on the ventral surface; caudal stylets cylindrical, extremely long and slender, from eight to ten times as long as broad, bearing one small seta on the outer margin beyond the middle, and three at the apex, one of which is spatulate at its base and nearly as wide as the stylet itself (fig. 18). Antennules sparingly clothed with extremely short setae, 24-jointed, slender, about as long as the cephalothorax (figs. 16, 17). Feet of the fifth pair (fig. 19) simple, rudimentary, three-jointed, the last joint nearly twice as long as either of the preceding two and ending in three small claw-like setae. Terminal spines of the outer branch of the swimming-feet (fig. 20) well-developed and stout, the principal one strongly serrated with about fourteen teeth on its inner margin. Length 1.75 millim.

*Male*.—Cephalothorax and abdomen as in the female except that the abdomen is five-jointed; none of the caudal setæ have dilated bases (fig. 23). Eighteenth joint of the right antennule (fig. 21) very faintly serrulated. Fifth foot (fig. 22) of the right side strongly prehensile, basal joint large, subquadrate, and produced into a long curved claw which opposes the three-jointed outer ramus; first joint of the outer ramus about twice as long as broad, second and third not much longer than broad and bearing respectively one and two short marginal spines; fifth foot of the left side short, simple, three-jointed, last joint forming a short curved unguis.

*Hab.* Taken plentifully in the surface-net in the Bay of Islands and Otago Harbour, also at a depth of 6 fathoms in Auckland Harbour.

Of all the specimens examined not one was found in perfect condition, and all were very brittle and opaque owing to the action of picric acid preservative. The species is very closely allied to the well-known *T. longicornis* of European seas, but there is no serration of the right male antennule, except on the eighteenth joint; the widely-dilated tail-seta of the female is characteristic, and the serratures of the spines of the swimming-feet are much fewer and larger than in *T. longicornis*.

#### Genus CENTROPAGES Kröyer.

##### 1. CENTROPAGES DISCAUDATUS, sp. nov. (Plate X. figs. 1-7.)

? *Centropages typicus* Kröyer, var. *aucklandicus* Krämer (1), pl. xv. figs. 1-5, p. 217.

*Female*.—Antennules very slender, 24-jointed, reaching considerably beyond the posterior end of the cephalothorax. Infrapostal angle of the cephalothorax produced on each side into a long spine. Abdomen (fig. 6) three-jointed; first joint dilated proximally and bearing on its dorsal margin a slender plumose seta; second joint longer, much dilated proximally; third very short, constricted proximally; furcal joints short, not much longer than broad, almost square as seen from above (fig. 7), distally truncated and bearing five rather short terminal setæ, three of which are bulbously dilated at the base. Outer branch of the fifth pair of feet (fig. 5) having its second joint produced inwardly into a very stout and long spine.

*Male*.—Infrapostal angles of the cephalothorax spinous, but not so strongly as in the female; abdomen four-jointed, all the joints subcylindrical (fig. 1), furcal joints cylindrical, about twice as long as broad, terminal setæ not swollen at the base; the first abdominal segment short, the following three nearly equal, not very much longer than broad and altogether devoid of spines. Basal joints of the antennules (fig. 1) almost devoid of marginal processes or teeth; joints from the 13th to the 18th much swollen, the 15th and 16th each bearing a strong marginal spine; the three following joints densely pectinated with fine setæ (figs. 2, 3), which, at the base of the 17th joint, are replaced by a series of small squared tubercles. Outer branch of the fifth pair of feet of the right side (fig. 4) terminating in a chelate joint, the blades of which are

long, slender, only moderately curved, and not at all crenulated, the outer blade having a markedly constricted median neck; outer branch of the left foot devoid of marginal setæ, simple, and terminating in two very small apical setæ. Length 1.6 millim.

*Hab.* Taken in the surface-net at Port Chalmers and in Otago Harbour.

This may perhaps be the form referred to by Dr. Krämer as *Centropages typicus*, var. *aucklandicus*, though in some respects it does not agree accurately with his figures and description. It cannot, I think, be properly referred to any variety of *C. typicus*, though the pectinated armature of the male right antennule agrees exactly with that species. To make my meaning clearer I give some of the more important characters of the two species in a tabular form.

It is, however, very closely allied to *C. brachiatus* (Dana), and the females of the two species may not be easily distinguishable, but the armature of the antennule, together with the structure of the fifth pair of feet in the male, presents very sufficient distinctive characters.

	<i>C. typicus.</i>	<i>C. discaudatus.</i>
Basal joints of the antennules...	First, second, and fifth joints in both sexes have strong marginal spines.	No well-developed spines on the basal joints in either sex.
15th and 16th joints of the right male antennule.	Sixteenth joint has a strong spine. <sup>1</sup>	A strong spine on both joints.
First abdominal somite in female.	Two slender spine-like setæ on ventral and a shorter one on dorsal aspect.	One dorsal seta.
Caudal segments in female.....	Twice as long as broad; setæ not swollen at base.	Scarcely longer than broad; setæ swollen at base.
Prehensile branch of right fifth foot in male.	Inner claw slightly pectinated; outer not distinctly constricted in middle.	Inner claw not pectinated; outer distinctly constricted.

## 2. CENTROPAGES PECTINATUS, sp. nov. (Plate IX. figs. 24-27.)

*Female.*—Abdomen slender, four-jointed (figs. 26, 27), the first joint wider than the rest, bearing on its dorsal surface a brush of several fine hairs and at the posterior angle a single slender spine; caudal segments about thrice as long as broad, two or three of the principal terminal setæ dilated basally (fig. 27 *b*). Lateral spines of the outer branches of the swimming-feet lancet-shaped, with very finely pectinated margins; median joint of the outer branch of the fifth pair (fig. 25) produced internally into a

<sup>1</sup> Giesbrecht figures a rather feeble spine also on the fifteenth joint, but I have not been able to find it in any of my specimens.

long falcate spine, the concave margin of which is distinctly pectinated; the basal joint of the fourth (?) pair of feet bears also a very long falcate spine (fig. 24). Male unknown.

This description is extremely imperfect, being based upon only two battered specimens which were taken—one off Napier in the net at a depth of 8 fathoms, the other at the surface in Otago Harbour.

The characters seem clearly to distinguish this from any described species.

#### Subfamily PONTELLINÆ.

#### Genus LABIDOCERA Lubbock.

##### 1. LABIDOCERA CERVI Krämer. (Plate X. figs. 8-14.)

*Labidocera cervi* Krämer (1), p. 218, pl. xvi. figs. 6, 7.

*Female*.—Cephalothorax subtruncate posteriorly, the ventral angles produced and mucronate (fig. 9). Abdomen four-jointed, the first, second, and third segments about equal, fourth about half as long as the preceding; caudal laminae rather longer than broad, obliquely quadrate (figs. 9, 13); terminal setae scarcely as long as the abdomen. Antennules reaching to the posterior extremity of the cephalothorax. Fifth pair of feet (fig. 10) alike on both sides, two-branched, the internal branch composed of one small joint, the outer of one much larger joint which bears three moderately large lateral teeth and two smaller and much more slender ones at the apex. In the immature condition, however (fig. 11), the outer branch consists first of three and afterwards of two joints. Length 2·3 millim.

*Male*.—The infero-posteal angles of the cephalothorax (fig. 13) are not quite so strongly spined as in the female; the abdomen five-jointed (fig. 13). The armature of the right antennule consists of a fine pectination of the seventeenth and eighteenth and of the coalescent nineteenth, twentieth, and twenty-first joints: the twenty-second joint is prolonged internally, forming a sharp process which extends beyond the apex of the penultimate joint. The right foot of the fifth pair (fig. 14) is strongly prehensile, the basal joint simple, second joint attached near the middle by a hinge-articulation, its outer portion forming a slender flexuous process, its inner portion forming a broad lamina and giving attachment at its apex to a long and slender falcate joint which opposes the outer process of the second joint; the foot of the left side is simple, slender, three-jointed, nearly as long as that of the right side, its terminal joint having a few short apical teeth and near the distal extremity a diffuse pubescent patch. Length 2·8 millim.

*Hab.* In the surface-net, from Otago and Akaroa.

Though my observations differ in some respects from those of Dr. Krämer, I have

no doubt that this is the species named by him *Labidocera cervi*. Dr. Krämer says that the abdomen of the female is two-jointed, and in some specimens I have found the abdominal segments so interfused that it is difficult to make out the number: there may, indeed, be no visible separation, but in some there are distinctly four segments. In the allocation of joints to the right male antennule, I have followed Dr. Giesbrecht (*Labidocera nerii*, &c.), not having myself been able to make them out distinctly in the New Zealand specimens.

#### Family CYCLOPIDÆ.

##### Genus CYCLOPS (O. F. Müller).

###### 1. CYCLOPS EWARTI G. S. Brady. (Plate X. figs. 15-17.)

1888. *Cyclops ewarti* G. S. Brady (3), pl. viii. figs. 1-6.

1891. „ „ idem (4) pl. vii. figs. 4-7.

One specimen of a *Cyclops* which I cannot in any way distinguish from *C. ewarti* was found in a surface-net gathering from Otago Harbour.

This capture is peculiarly interesting, inasmuch as the species was originally described from specimens taken in the Firth of Forth, and it seemed doubtful whether they might not have made their way thither from some neighbouring freshwater habitat. No other instance is on record, so far as I know, of a true *Cyclops* having been found living in the sea, and it is very remarkable that this New Zealand example, of the purely pelagic character of which there can be no doubt, should belong to the same species.

I have thought it well to figure here some of the parts of the Otago specimen. The only difference between it and the Scottish examples is the greater width of the abdomen, which may, however, be accounted for by pressure. An interesting peculiarity of the species, in which both northern and southern forms agree, is the bipectinate character of the terminal spine of the inner branch of the fourth pair of feet (Pl. II. fig. 17 *a*). In all other species these pectinations are represented by very fine setæ.

##### Genus OITHONA Baird.

###### 1. OITHONA SPINIFRONS Boeck.

*Oithona spinifrons* Boeck (1), p. 25.

„ „ G. S. Brady (2), p. 90, pl. xiv. figs. 1-9, pl. xxiv A. figs. 1, 2.

Frequent in surface gatherings from Otago Harbour, and in the tow-net at 7 fathoms off Gisborne.

I cannot distinguish these specimens from those which I have already (*loc. cit.*) described and figured under the above name. Dr. Giesbrecht disagrees with my

reference and thinks that they belong to *O. spinifrons* Claus, but in the length of the antennules and some other characters they seem to me to agree more closely with Boeck's species.

### Family HARPACTICIDÆ.

#### Subfamily LONGIPEDIINÆ.

##### Genus ECTINOSOMA Boeck.

#### 1. ECTINOSOMA AUSTRALE, sp. nov. (Plate X. figs. 18-25.)

Antennules seven-jointed (?); first three joints stout and short, the succeeding joints much more slender (fig. 18); antennæ (fig. 19) nearly as long as the antennules, three-jointed, secondary branch three-jointed, the second joint very short. Mandibles (fig. 20) with one large terminal tooth and four short spinules; palp long, two-jointed, and bearing on the first joint a minute two-jointed branchlet. The mouth-organs (figs. 21, 22) and swimming-feet (fig. 23) present no special features. Feet of the fifth pair (fig. 24) much subdivided; inner segment digitiform and bearing two apical spine-like setæ, one of which is long, the other very short; outer segment lacinated, its inner lobe bearing, like the neighbouring segment, two unequal setæ, external to which are three short processes bearing single apical setæ, the first and third short, the second long and slender. Caudal laminae (fig. 25) very short and wide; setæ slender, non-plumose, the central one about twice as long as the two principal laterals. Length .66 millim.

*Hab.* Otago Harbour, between tide-marks.

The distinctions between many so-called species of *Ectinosoma* are extremely slight, and in this case the fifth foot is the only member which presents very definite characters. In the present state of our knowledge it seems very doubtful whether this, as well as some others, should not rank rather as varieties than as distinct species.

#### Subfamily TACHIDIINÆ.

##### Genus EUTERPE Claus.

#### 1. EUTERPE GRACILIS Claus.

1863. *Euterpe gracilis* Claus (1), p. 110, pl. xiv. figs. 1-13.

1880. „ „ G. S. Brady (1), p. 22, pl. xl. figs. 1-16.

1892. „ *acutifrons* Giesbrecht (1), p. 555, pl. xlv.

1852. ? *Harpacticus acutifrons* Dana (2), p. 1192, pl. lxxxiii. figs. 11 a, b.

This species was found plentifully in most of the gatherings. In the surface-net from Otago Harbour and Port Chalmers; in the net at 6 fathoms, Auckland Harbour; 7 fathoms, off Gisborne; 8 fathoms, off Napier.

## Subfamily AMYMONINÆ.

## Genus AMYMONÉ Claus.

## 1. AMYMONÉ CLAUSII Thomson.

1882. *Amymoné clausii* Thomson (1), p. 98, pl. v. figs. 1-8.

Taken in the surface-net, Bay of Islands.

## Subfamily CANTHOCAMPTINÆ.

## Genus LAOPHONTE Philippi.

## 1. LAOPHONTE SERRATA (Claus).

1863. *Cleta serrata* Claus (1), p. 123, pl. xv. figs. 13-20.

1880. *Laophonte serrata* G. S. Brady (1), vol. ii. p. 71, pl. lxxiii. figs. 1-14.

*Hab.* On algæ in Lyttelton Harbour.

## 2. LAOPHONTE MEINERTI, sp. nov. (Plate XI. figs. 1-10.)

Antennules of the *female* short, seven-jointed (fig. 2); the comparative lengths of the joints as in the following formula:  $\frac{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7}{6 \cdot 13 \cdot 9 \cdot 3 \cdot 4 \cdot 3 \cdot 5}$ . Posterior foot-jaws (fig. 4) slender; hand narrow, its external margin obscurely angulated near the middle; terminal unguis slender, slightly curved, rather longer than the hand. First pair of feet (fig. 5) very slender; outer branch three-jointed, scarcely more than one-third as long as the inner branch, exclusive of the terminal unguis; inner branch much elongated, destitute of setæ, with a long and slender apical unguis. Swimming-feet (fig. 6) small and slender. Feet of the fifth pair (fig. 8) small, foliaceous, each joint bearing several marginal setæ, one of which is much longer than the rest. Length .75 millim.

Second joint of the *male* antennule produced posteriorly into a short conical spine; fourth joint very much enlarged and forming a quadrate vesiculiform swelling, from the anterior border of which arises a stout curved sensory filament (fig. 3).

*Hab.* On algæ in Lyttelton Harbour. Two specimens.

Two further specimens, which may perhaps belong to this species, were found in a gathering from between tide-marks in Otago Harbour. Figures of the posterior foot-jaws and of the first and fifth feet of these specimens are given in Plate XI. figs. 9, 10. These do not altogether correspond with similar parts of *L. meinerti*, but the differences may possibly be varietal only.

## Subfamily HARPACTICINÆ.

## Genus DACTYLOPUS Claus.

## 1. DACTYLOPUS TISBOIDES Claus.

1863. *Dactylopus tisboides* Claus (1), p. 127, pl. xvi. figs. 24-28.

1880. „ „ G. S. Brady (1), p. 106, pl. liv. figs. 1-16.

*Hab.* Between tide-marks, Otago Harbour.

## 2. DACTYLOPUS HANSENI, sp. nov. (Plate XI, figs. 11-18.)

Very similar to *D. tisboides* in general appearance (fig. 11), but rather larger. Antennules of the *female* (fig. 12) eight-jointed, rather densely setiferous; fourth joint bearing a stout sensory filament. Posterior foot-jaw (fig. 14 *a*) slender; hand bearing on each margin a single seta and a fringe of minute cilia; terminal claw slender, about as long as the hand itself. Terminal claws of the first pair of feet (fig. 15) long and slender, as are also the spines of the outer branch; penultimate joint of the inner branch bearing near the distal extremity a single small plumose seta. Fifth pair of feet of the *female* (fig. 18) large, the inner lamina considerably shorter than the outer one; apex finely ciliated, subtruncated, and bearing two long and two short setæ; distal extremity of the outer lamina bearing six setæ of various lengths and widely separated, the lateral margins ciliated; no cilia between the large setæ. Length .85 millim.

*Male*.—The antennule (fig. 13) is geniculated, but none of the joints are very tumid; terminal joint of the inner branch of the second pair of feet (fig. 16) forming two curved finger-like processes, from near the base of which spring two long plumose setæ: fifth pair small (fig. 17); inner lamina shorter than the outer, with two short spine-like apical setæ; outer bearing six setæ, the two apical ones much longer than the rest.

*Hab.* Lyttelton Harbour: on algæ, 1 specimen; tow-net at 6 fathoms, 1 specimen.

The nearest allies of this species seem to be *D. cinctus* (Claus) and *D. stromii* Baird, but both of them differ distinctly in minor points.

## Genus FLAVIA, gen. nov.

Like *Dactylopus*, except that the inner branch of the second pair of feet consists of one greatly elongated joint, and is entirely destitute of spines or claws (Plate X, fig. 30). Anterior and posterior foot-jaws simple, prehensile, with long terminal ungues.

## 1. FLAVIA CRASSICORNIS, sp. nov. (Plate X. figs. 26-31.)

Antennules very short and stout, two-jointed, moderately setiferous (fig. 26). Feet of the first pair as in *Dactylopus*, the terminal unguis thick and hook-like (fig. 29): inner branch of the second pair (fig. 30) longer than the outer branch, very slender, with truncate unarmed apex; near the base there is on each margin an angular prominence, from which springs a minute seta, and near the distal extremity on the outer margin a rounded non-setiferous tubercle, nearly opposite to which, from the inner margin, arise two long and delicate plumose setæ. Anterior foot-jaw simple, elongated, with a slightly curved terminal unguis (fig. 27); posterior somewhat similar, the hand armed with a long slender marginal spine and a strong curved terminal unguis (fig. 28).

A single specimen of this species occurred in a gathering from among algæ in Lyttelton Harbour. The posterior antennæ, mandibles, and maxillæ were not seen distinctly enough to permit of their being figured, but in general conformation are similar to those of most Harpacticidæ.

## Genus PHROSO, gen. nov.

Body slender; in general appearance like *Canthocamptus*. First four pairs of feet with both branches three-jointed; feet of fifth pair foliaceous, unbranched. Internal branch of antennæ two-jointed. Mandible strongly toothed, palp two-branched. Anterior and posterior foot-jaws simple, with large terminal unguis and no palp.

## 1. PHROSO GRACILIS, sp. nov. (Plate XI. figs. 19-27.)

*Female*.—Antennules eight-jointed, rather densely setiferous; first four joints stout, last three much more slender (fig. 20): lengths of the joints as in the following formula:  $\frac{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7 \cdot 8}{12 \cdot 12 \cdot 8 \cdot 5 \cdot 5 \cdot 2 \cdot 4 \cdot 5}$ ; from the fifth joint arises a stout sensory filament. Antennæ (fig. 21) nearly as large as the antennules, three-jointed; to the basal joint is attached a two-jointed internal branch. Mandibles well developed (fig. 22), with sharp slender teeth and a palp composed of a large basal joint and two single-jointed branches. Maxillæ (fig. 23) small, lobose (imperfectly seen). Anterior foot-jaw (fig. 24) slender, simple, geniculated, with a stout terminal unguis and three plumose setæ attached to the second joint. Posterior foot-jaw (fig. 25) larger than the anterior, composed of a single stout joint which bears a long falcate, terminal unguis. Basal joint of the fifth pair of feet (fig. 27) short and broad, and bearing on each lateral angle a long seta; terminal joint subovate, twice as long as broad; apex narrow and truncate; external margin ciliated above, and below the middle having two long widely separated setæ. Length 1.3 millim. Male unknown.

*Hab.* One specimen taken in the surface-net, Port Chalmers.

## Genus THALESTRIS Claus.

## 1. THALESTRIS FORFICULA Claus.

1863. *Thalestris forficula* Claus (1), p. 131, pl. xvii. figs. 7-11.

„ „ Thomson (1), p. 104, pl. x. figs. 16-21.

Otago Harbour, between tide-marks; "dredged abundantly in Dunedin Harbour" (*Thomson*).

## 2. THALESTRIS CILIATA, sp. nov. (Plate XI. figs. 28-33.)

Robust; lateral margins of the abdominal segments clothed with short setæ (fig. 33). Antennules nine-jointed (fig. 28); joints subequal, the length represented by the following formula:  $\frac{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7 \cdot 8 \cdot 9}{8 \cdot 8 \cdot 6 \cdot 6 \cdot 4 \cdot 6 \cdot 3 \cdot 3 \cdot 4}$ . Posterior foot-jaw forming a subovate, elongated hand, the anterior margin of which bears a continuous fringe of short, closely-set setæ; terminal unguis stout, falcate, more than half as long as the hand (fig. 29). Outer branch of the first pair of feet (fig. 30) with densely pectinated margin: one long and stout spine at the apex of the first and one on the middle of the second joint; the last joint has two fine marginal setæ and one very long, slender seta at the apex, between which are two stout falcate claws with hook-like projections at their bases: the outer branch has a single seta near the distal extremity of the first joint, and at its apex are two ungues, one large and one small. The marginal spines of the swimming-feet (fig. 31) are long and slender, and the outer edges of the joints of both branches are ciliated. The two laminæ of the fifth pair of feet (fig. 32) are of equal length; the outer lamina ovate, with finely ciliated margins, four long setæ at the apex and two on the outer edge; the inner lamina has five principal setæ, two marginal and three apical, the intervals between which are ciliated. Male unknown.

*Hab.* Akaroa Harbour. One specimen only.

## 3. THALESTRIS AUSTRALIS, sp. nov. (Plate XII. figs. 1-5.)

Antennules nine-jointed, slender, the comparative lengths of the joints as in the following formula:  $\frac{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7 \cdot 8 \cdot 9}{8 \cdot 10 \cdot 7 \cdot 8 \cdot 6 \cdot 6 \cdot 4 \cdot 4 \cdot 6}$  (fig. 1). Hand of the posterior foot-jaw (fig. 2) subovate, bearing near the middle of the anterior margin a single spine-like seta, terminal unguis moderately stout and reaching a little beyond the middle of the hand. Outer branch of the first pair of feet (fig. 3) shorter than the inner, stout, its inner margin bearing rather in front of the middle a stout plumose seta, outer margin a large median spine and four apical ungues which successively increase in length from first to last; the inner branch has a long, slender, apical unguis and a much shorter seta; anterior margins of the larger ungues of both branches finely pectinated. Marginal spines of the swimming-feet (fig. 4) long and slender, with

blunt apices; external margins of all the joints ciliated. Laminae of the fifth pair of feet (fig. 5) broad, subovate, nearly equal in length; margins of the external lamina finely ciliated, and bearing six subequal apical setae; inner lamina with five setae on its subtruncate apical margin. Abdominal segments slightly overlapping each other, but altogether devoid of setae or serrulations. Male unknown.

*Hab.* Otago Harbour, between tide-marks. One specimen only.

#### Genus HARPACTICUS Milne-Edwards.

##### 1. HARPACTICUS GLABER, sp. nov. (Plate XII. figs. 6-11.)

*Female.*—In general appearance like *H. chelifera*. Antennules (fig. 6) slender, moderately setiferous, eight-jointed; lengths of the joints as in the following formula:  
 $\frac{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7 \cdot 8}{10 \cdot 11 \cdot 11 \cdot 8 \cdot 4 \cdot 4 \cdot 3 \cdot 1}$ . Antennae (fig. 7) stout, nearly as long as the antennules, bearing a small two-jointed branch, extremity of the last joint abruptly truncated and bearing two long, rigid, finely pectinated spines and four slender geniculated setae; posterior foot-jaw (fig. 8) almost exactly similar to that of *H. chelifera*. Outer branch of the first pair of feet elongated, two-jointed, terminating in three subequal, blunt, slightly curved and very finely pectinated claws; outer margins very sparingly ciliated; each joint bearing within a short distance of its distal end a single short marginal seta; inner branch terminating in a strong slightly curved claw; the long first joint slightly ciliated and having near its apex a slender seta. Feet of the fifth pair two-jointed (fig. 10), basal joint wide, its inner portion distally produced and giving attachment to three long setae; terminal joint much narrower, margins ciliated, with three long setae at the apex and one on the outer edge. The spines of the swimming-feet, like those of the first pair and of the antennae, are minutely pectinated. The margins of the abdominal segments (fig. 11) are smooth except for a few minute hairs at the lateral angles and on the caudal laminae; principal tail-setae very long.

*Hab.* Otago Harbour. One specimen taken in the surface-net.

From *H. chelifera* this species may be distinguished by the number and comparative lengths of the joints of the antennules, by the armature of the antennae, the non-spinous margins of the first pair of feet, the different build of the fifth pair, and the almost smooth margins of the abdominal somites. There seem to be points of difference also in the mandibles and maxillae, but these I have not clearly made out.

#### Genus PELTIDIUM Philippi.

##### 1. PELTIDIUM NOVÆ-ZEALANDIÆ, sp. nov. (Plate IX. figs. 28, 29; Plate XII. figs. 12-15.)

This is in general build and appearance exactly like the common European species *P. interruptum*, Goodsir, the only important differences being found in the posterior

foot-jaw and fifth pair of feet. The manus of the second pair of foot-jaws (Pl. IX. fig. 29) is ovate, elongated, the anterior margin fringed with a continuous series of short setæ; terminal unguis long and slender. Feet of the fifth pair (Pl. XII. fig. 14) stout, simple, with truncate apex, which bears three short, stout, and very blunt spines, the outermost of which is attached at a little distance from the apex: the inner margin bears beyond the middle a single seta; the outer margin has also a single seta much nearer the base, and is slightly pubescent between that point and the apex. The shell is extremely hard and thick, and closely beset with small circular puncta. Colour dark brown. Length .85 millim.

*Hab.* Taken in the surface-net, Port Chalmers and Otago.

#### Subfamily IDYINÆ.

#### Genus IDYA Philippi.

##### 1. IDYA FURCATA (Baird).

*Tisbe furcata* Claus, Lilljeborg.

*Canthocamptus furcatus* Baird.

*Idya furcata* Boeck, Brady, Thomson.

On algæ in Lyttelton Harbour. "Common in shore-kelp and rock-pools near Dunedin; also on kelp in Paterson's Inlet" (*Thomson*).

#### Genus SCUTELLIDIUM Claus.

##### 1. SCUTELLIDIUM PLUMOSUM, sp. nov. (Plate XII. figs. 16-21, 23-25.)

In general form and appearance indistinguishable from the British *S. tisboides*. The setose investiture of the first foot (fig. 20) is, however, more dense, and the spinous armature of the last joint of the outer branch of the swimming-feet (fig. 21) is also different, there being on the outer margin towards the apex two plumose lancet-shaped spines with intermediate small hairs, while in *S. tisboides* (fig. 22) there are three stout, non-plumose, dagger-shaped spines with no intermediate hairs. Fifth foot in the *female* (fig. 25) elongated, slender, subrescentic, pointed at the extremity, with setose margins, but not pubescent on the surface; in the *male* (fig. 23) small, subquadrate, with obliquely truncated apex, which bears three long and several shorter setæ. The antennules in the *male* are geniculated (fig. 16): from the second joint springs a small biarticulate peduncle, which bears three stout sensory filaments, and to the antepenultimate joint is attached a much longer and stouter sense-organ. Length .88 millim.

*Hab.* This species occurred sparingly in surface gatherings from Otago and Port Chalmers, and in gatherings from seaweeds in Akaroa and Lyttelton Harbours.

The males of *S. plumosum* seem, like those of *S. tisboides*, to be scarce. I have seen only one specimen, some parts of which are here figured. Of *S. tisboides* I have hitherto seen only one imperfect male specimen; and as Dr. Claus has only very partially described or figured it, one may suppose that his experience is similar.

Subfamily PORCELLIDIINÆ.

Genus PORCELLIDIUM Claus.

1. PORCELLIDIUM FULVUM Thomson.

1882. *Porcellidum fulvum* Thomson (1), p. 107, pl. vi. figs. 10, 11, pl. vii. figs. 8-13.

On algæ in Lyttelton Harbour.

Section II. PÆCIILOSTOMA Thorell.

Family CORYCÆIDÆ Dana.

Genus CORYCÆUS Dana.

1. CORYCÆUS ROBUSTA Dana (?).

Specimens which I refer doubtfully to this species were taken in the surface-net off Port Chalmers and in Otago Harbour.

Genus PAUROCOPE, gen. nov.<sup>1</sup>

Antennules five-jointed; antennæ three-jointed, simple; mandibles simply toothed; posterior foot-jaw forming a prehensile hand with two slender terminal ungues. Two pairs of swimming-feet, each foot consisting of two one-jointed branches.

1. PAUROCOPE ROBUSTA, sp. nov. (Plate XIII. figs. 1-9.)

Antennules (fig. 3) short, five-jointed, sparingly setiferous, joints nearly equal in length. Antennæ nearly as long as the antennules, simple, three-jointed, last joint shorter than the preceding, subquadrate, with six setæ arising from the subtruncate apex, and on the proximal half of the posterior margin a series of about six small, equal, pellucid, lancet-shaped setæ; on the distal half two short and two rather longer, stout, curved, plumose setæ (fig. 4). Trophi very small; mandibles without a palp (?),

<sup>1</sup> πῦρος, few; κώπη, an oar.

apex broad and bearing an even series of small teeth (fig. 5). Maxillæ composed of four digitiform lobes (fig. 6), which are armed with numerous spine-like divaricate setæ. Anterior foot-jaws laminar, bearing numerous lateral setæ, but not divided into distinct lobes (fig. 7): posterior foot-jaws two-jointed, basal joint short and stout, with three rigid spiniferous setæ at the anterior distal angle; second joint forming a strong subtriangular hand, to the anterior angulated margin of which are attached two long stout setæ, to the narrow distal extremity are hinged two long, biarticulate, slender ungues, which are armed with spine-like marginal setæ (fig. 8). Two pairs of swimming-feet (fig. 9), two-branched, each branch consisting of a single broad lamina; distal and outer margins of the inner branch setiferous; outer branch with four large lancet-shaped spines on the outer margin, at the apex a larger spine, and on the inner margin three long setæ. The cephalothorax is equal in length to the abdomen, and consists of three segments only, the first two being coalescent (figs. 1, 2); the abdomen is two-jointed and suddenly narrower than the cephalothorax: to the posterior angles of the last thoracic segment are attached two small setæ; angles of the first abdominal segments produced backwards, second segment twice as long as the preceding, constricted in front; caudal segments very short. Length .88 millim.

*Hab.* Of this very interesting species two specimens were found in a surface-net gathering from Otago Harbour, and one in the net at 7 fathoms from off Gisborne.

The specimen described by Mr. T. Scott under the generic name *Saphirella* seems to be, except as to the mouth-organs, very similar to the present, and I regret that, owing to the *Saphirella* having passed out of Mr. Scott's hands, I have not been able to compare the actual specimens. Mr. Scott's descriptions may be found in his paper on Entomostraca from the Gulf of Guinea (Transactions of the Linnean Society, 2nd ser. Zool. vol. vi. pt. 1, 1894).

[Closely allied to *Paurocope* is a form represented in these gatherings by only two imperfect specimens, which, like *Paurocope*, were taken at the surface in Otago Harbour. I am unable, for want of suitable material, to give a complete account of this species, and it seems not unlikely that it may really represent the male of *Paurocope*, the general resemblance being very close, more especially in the swimming-feet and caudal laminae. The antennules and antennæ are, however, very different, but this difference, to a lesser extent, is likewise seen in the closely related genera *Sapphirina* and *Corycæus*. A very remarkable character is found in the presence of two simple lenses (ocelli) at the bases of the second pair of foot-jaws. Figures of the animal and some of its appendages are given in Plate XIII. figs. 10-17.

Provisionally I propose the name *Centromma thomsoni* for this species.]

Section III. *SIPHONOSTOMA* Thorell.

## Family ENTOMOLEPIDÆ, fam. nov.

Genus ENTOMOLEPIS<sup>1</sup>, gen. nov.

Dorsal surface covered by a thin, oval, scale-like shield, beyond which the extremities of the limbs project only slightly. Antennules slender, simple; antennæ prehensile; swimming-feet two pairs (?). Abdomen short, slender, and, like the cephalothorax, completely covered by the scale-like dorsal investment.

## 1. ENTOMOLEPIS OVALIS, sp. nov. (Plate XIII. figs. 18-21.)

Outline, as seen from above, oval, widest in the middle, width equal to more than half the length (fig. 18). Antennules ten-jointed, slender, the penultimate joint bearing a long and stout sensory filament (fig. 19); the comparative lengths of the joints as in the following formula:  $\frac{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7 \cdot 8 \cdot 9 \cdot 10}{23 \cdot 17 \cdot 4 \cdot 4 \cdot 3 \cdot 5 \cdot 7 \cdot 7 \cdot 10 \cdot 8}$ . Antennæ three-jointed (fig. 20), the basal joint bearing at its apex a minute secondary branch; second joint with a row of fine cilia on its distal half; third joint small and having a stout terminal unguis. Maxilla simple, two-jointed, the second joint pubescent and bearing three long terminal setæ. Two pairs of foot-jaws (figs. 18 *d*, *e*), stout, prehensile, like those of *Dyspontius*. Siphon slender and of moderate length; swimming-feet two pairs (?) two-branched, each branch composed of three joints (fig. 18 *f*). Length 1.3 millim.

One specimen only was found among mud from a depth of 1-5 fathoms in Lyttelton Harbour.

The foregoing description is incomplete, owing to some of the parts having been imperfectly seen, and it is to be hoped that some future observer may be enabled by the help of further specimens to describe more fully what seems to be a very remarkable form.

## Family ARTOTROGIDÆ.

## Genus ARTOTROGUS Boeck.

## 1. ARTOTROGUS OVATUS Thomson.

*Artotrogus ovatus* Thomson (1), p. 113, pl. xi. figs. 11-14.

In the surface-net off Port Chalmers. One specimen.

## 2. ARTOTROGUS BREVICAUDATUS, sp. nov. (Plate XII. figs. 27-29; Plate XIII. figs. 22-26.)

Cephalothorax much narrowed in front, widest behind the middle; abdomen very short, only about one third as long as the cephalothorax (Plate XIII. fig. 22); siphon

<sup>1</sup> ἔντομον, an insect; λεπίς, a scale.

long and slender (fig. 24). Antennules very short, fourteen-jointed (?) (fig. 23), the basal joints very indistinctly marked; comparative lengths of the joints as in the following formula:  $\frac{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7 \cdot 8 \cdot 9 \cdot 10 \cdot 11 \cdot 12 \cdot 13 \cdot 14}{3 \cdot 5 \cdot 2\frac{1}{2} \cdot 2\frac{1}{2} \cdot 2\frac{1}{2} \cdot 2\frac{1}{2} \cdot 4 \cdot 5 \cdot 4 \cdot 6 \cdot 4 \cdot 5 \cdot 5 \cdot 5}$ . First segment of the abdomen much longer than the following segments, inclusive of the furca (fig. 26). The mouth-organs and swimming-feet present no distinctive characters. Length 1.1 millim.

*Hab.* Akaroa Harbour, 6 fathoms.

#### Genus CALIGUS.

##### 1. CALIGUS LONGICAUDATUS, sp. nov. (Plate XII. fig. 26.)

A single specimen of a *Caligus*, which seems distinct from any described species, occurred in a surface-net gathering from Port Chalmers. The much elongated abdomen, the abruptly angular carapace, together with the slenderness and length of the last pair of feet, are the chief distinctive characters. Length 5 millim.

### EXPLANATION OF THE PLATES.

#### PLATE IX.

##### *Paracalanus parvus*, p. 32.

- Fig. 1. Antennule of male,  $\times 140$ .  
 Fig. 2. Foot of fifth pair of male,  $\times 210$ .

##### *Clausocalanus furcatus*, p. 32.

- Fig. 3. Female, seen from right side,  $\times 84$ .  
 Fig. 4. Fifth pair of feet of female,  $\times 250$ .  
 Fig. 5. Antennule of male,  $\times 84$ .  
 Fig. 6. Fifth pair of feet of male,  $\times 210$ .  
 Fig. 7. Abdomen and foot of fifth pair,  $\sigma$ , seen laterally,  $\times 165$ .

##### *Acartia ensifera*, p. 33.

- Fig. 8. Female, seen from above,  $\times 84$ .  
 Fig. 9. Abdomen of female, seen from right side,  $\times 110$ .  
 Fig. 10. Fifth pair of feet of female,  $\times 210$ .  
 Fig. 11. Terminal spine of one of the swimming-feet,  $\times 210$ .  
 Fig. 12. Right antennule of male,  $\times 140$ .  
 Fig. 13. Left antennule of male,  $\times 140$ .  
 Fig. 14. Abdomen of male,  $\times 110$ .  
 Fig. 15. Fifth pair of feet of male,  $\times 250$ .

*Temora tenuicauda*, p. 34.

- Fig. 16. Female, seen from left side,  $\times 50$ .  
 Fig. 17. Antennule of female,  $\times 84$ .  
 Fig. 18. Abdomen of female,  $\times 84$ .  
 Fig. 19. Foot of fifth pair,  $\varphi$ ,  $\times 210$ .  
 Fig. 20. Terminal spine of swimming-feet,  $\times 300$ .  
 Fig. 21. Right antennule of male,  $\times 84$ .  
 Fig. 22. Fifth pair of feet of male,  $\times 110$ .  
 Fig. 23. Abdomen of male, seen from front,  $\times 210$ .

*Centropages pectinatus*,  $\varphi$ , p. 36.

- Fig. 24. Foot of fourth pair (?),  $\times 84$ .  
 Fig. 25. Foot of fifth pair,  $\times 210$ .  
 Fig. 26. Abdomen, seen from front,  $\times 84$ .  
 Fig. 27. „ „ „ side,  $\times 84$ .  
     a. Setæ of first segment, more highly magnified.  
     b. Setæ of tail, more highly magnified.

*Peltidium novæ-zealandiæ*, p. 44.

- Fig. 28. Antennule of female,  $\times 140$ .  
 Fig. 29. Posterior foot-jaw,  $\times 210$ .

## PLATE X.

*Centropages discaudatus*, p. 35.

- Fig. 1. Male, seen from right side,  $\times 65$ .  
 Fig. 2. Armature of 17th segment of right antennule,  $\sigma$ ,  $\times 210$ .  
 Fig. 3. „ 17th, 18th, and 19th segments of same,  $\times 210$ .  
 Fig. 4. Fifth pair of feet of male,  $\times 84$ .  
 Fig. 5. „ „ female,  $\times 100$ .  
 Fig. 6. Abdomen of female, seen from side,  $\times 100$ .  
 Fig. 7. Furca of female,  $\times 100$ .

*Labidocera cervi*, p. 37.

- Fig. 8. Antennule of female,  $\times 50$ .  
 Fig. 9. Abdomen of female, seen from below,  $\times 50$ .  
 Fig. 10. Foot of fifth pair,  $\varphi$ ,  $\times 50$ .  
 Fig. 11. The same, immature,  $\times 84$ .  
 Fig. 12. Right antennule of male,  $\times 50$ .  
 Fig. 13. Abdomen of male,  $\times 50$ .  
 Fig. 14. Fifth pair of feet of male,  $\times 50$ .

*Cyclops ewarti*, p. 38.

- Fig. 15. Antennule of female,  $\times 140$ .  
 Fig. 16. Abdomen of same,  $\times 84$ .  
 Fig. 17. Fourth foot of same,  $\times 140$ .  
 a. Terminal spine of inner branch of the same,  $\times 300$ .

*Ectinosoma australe*, ♀, p. 39.

- Fig. 18. Antennule,  $\times 250$ .  
 Fig. 19. Antenna,  $\times 210$ .  
 Fig. 20. Mandible,  $\times 250$ .  
 Fig. 21. Anterior foot-jaw,  $\times 250$ .  
 Fig. 22. Posterior foot-jaw,  $\times 250$ .  
 Fig. 23. One of the swimming-feet,  $\times 210$ .  
 Fig. 24. Foot of fifth pair,  $\times 210$ .  
 Fig. 25. Caudal segments and setæ,  $\times 210$ .

*Flavia crassicornis*, ♀, p. 42.

- Fig. 26. Antennule,  $\times 250$ .  
 Fig. 27. Anterior foot-jaw,  $\times 250$ .  
 Fig. 28. Posterior foot-jaw,  $\times 250$ .  
 Fig. 29. Foot of first pair,  $\times 210$ .  
 Fig. 30. „ second pair,  $\times 210$ .  
 Fig. 31. Abdomen,  $\times 100$ .

## PLATE XI.

*Laophonte meinerti*, p. 40.

- Fig. 1. Female, seen from left side,  $\times 84$ .  
 Fig. 2. Antennule of female,  $\times 300$ .  
 Fig. 3. „ male,  $\times 300$ .  
 Fig. 4. Posterior foot-jaw,  $\times 300$ .  
 Fig. 5. Foot of first pair,  $\times 210$ .  
 Fig. 6. One of the swimming-feet,  $\times 210$ .  
 Fig. 7. Inner branch of foot of second pair, ♂,  $\times 300$ .  
 Fig. 8. Foot of fifth pair, ♀,  $\times 210$ .  
 Fig. 9. „ first pair,  $\times 225$ .  
 Fig. 10. „ fifth pair, variety,  $\times 210$ .

*Dactylopus hansenii*, p. 41.

- Fig. 11. Female, seen from left side,  $\times 100$ .  
 Fig. 12. Antennule of female,  $\times 210$ .  
 Fig. 13. „ male,  $\times 210$ .  
 Fig. 14. Inner branch of antenna,  $\times 210$ .  
 Fig. 14 *a*. Posterior foot-jaw,  $\times 280$ .  
 Fig. 15. Foot of first pair,  $\times 210$ .  
 Fig. 16. Inner branch of foot of second pair,  $\sigma$ ,  $\times 300$ .  
 Fig. 17. Foot of fifth pair,  $\sigma$ ,  $\times 210$ .  
 Fig. 18. „ „  $\varphi$ ,  $\times 210$ .

*Phroso gracilis*,  $\varphi$ , p. 42.

- Fig. 19. Female, seen from right side,  $\times 65$ .  
 Fig. 20. Antennule,  $\times 210$ .  
 Fig. 21. Antenna,  $\times 210$ .  
 Fig. 22. Mandible,  $\times 210$ .  
 Fig. 23. Maxilla,  $\times 210$ .  
 Fig. 24. Anterior foot-jaw,  $\times 250$ .  
 Fig. 25. Posterior foot-jaw,  $\times 250$ .  
 Fig. 26. Foot of fourth pair,  $\times 120$ .  
 Fig. 27. „ fifth pair,  $\times 210$ .

*Thalestris ciliata*,  $\varphi$ , p. 43.

- Fig. 28. Antennule,  $\times 210$ .  
 Fig. 29. Posterior foot-jaw,  $\times 260$ .  
 Fig. 30. Foot of first pair,  $\times 210$ .  
 Fig. 31. „ third pair,  $\times 175$ .  
 Fig. 32. „ fifth pair,  $\times 160$ .  
 Fig. 33. Abdomen, seen from front,  $\times 84$ .

## PLATE XII.

*Thalestris australis*,  $\varphi$ , p. 43.

- Fig. 1. Antennule,  $\times 210$ .  
 Fig. 2. Posterior foot-jaw,  $\times 210$ .  
 Fig. 3. Foot of first pair,  $\times 175$ .  
 Fig. 4. One of the swimming-feet,  $\times 175$ .  
 Fig. 5. Foot of fifth pair,  $\times 130$ .

*Harpacticus glaber*, ♀, p. 44.

- Fig. 6. Antennule, × 200.  
 Fig. 7. Antenna, × 200.  
 Fig. 8. Posterior foot-jaw, × 210.  
 Fig. 9. Foot of first pair, × 140.  
 Fig. 10. „ fifth pair, × 210.  
 Fig. 11. Abdomen and caudal setæ, × 84.

*Peltidium novæ-zealandiæ*, ♀, p. 44.

- Fig. 12. Foot of first pair, × 210.  
 Fig. 13. „ fourth pair, × 120.  
 Fig. 14. „ fifth pair, × 210.  
 Fig. 15. Abdomen, × 130.

*Scutellidium plumosum*, p. 45.

- Fig. 16. Antennule of male, × 300.  
 Fig. 17. Antenna of male, × 300.  
 Fig. 18. Anterior foot-jaw of male, × 210.  
 Fig. 19. Posterior foot-jaw of male, × 210.  
 Fig. 20. Foot of first pair of female, × 210.  
 Fig. 21. Outer branch of one of the swimming-feet, × 300.  
 Fig. 22. „ „ „ (D. *tisboides*: Irish specimen), × 300.  
 Fig. 23. Foot of fifth pair of male, × 250.  
 Fig. 24. First abdominal somite of male, × 210.  
 Fig. 25. Abdomen and tail of female with fifth pair of feet, × 140.

*Caligus longicaudatus*, p. 49.

- Fig. 26. Female, seen from below, × 16.

*Artotrogus brevicaudatus*, p. 48.

- Fig. 27. Mandible (?), × 120.  
 Fig. 28. Maxilla, × 210.  
 Fig. 29. Foot-jaw, × 120.

## PLATE XIII.

*Paurocope robusta*, ♀, p. 46.

- Fig. 1. Animal, seen from left side, }  
 Fig. 2. „ „ above, } × 84.  
 Fig. 3. Antennule, × 140.

- Fig. 4. Antenna,  $\times 210$ .  
Fig. 5. Mandible,  $\times 500$ .  
Fig. 6. Maxilla,  $\times 500$ .  
Fig. 7. Anterior foot-jaw,  $\times 500$ .  
Fig. 8. Posterior foot-jaw,  $\times 210$ .  
Fig. 9. Foot of first pair,  $\times 210$ .

*Centromma thomsoni*, p. 47.

- Fig. 10. Animal, seen from below,  $\times 140$ .  
Fig. 11. Antennule,  $\times 210$ .  
Fig. 12. Antenna (?),  $\times 210$ .  
Fig. 13. Mandible (?),  $\times 250$ .  
Fig. 14. Anterior foot-jaw,  $\times 210$ .  
Fig. 15. Posterior foot-jaw,  $\times 210$ .  
Fig. 16. Foot of first pair,  $\times 210$ .  
Fig. 17. Abdomen and caudal laminæ,  $\times 210$ .

*Entomolepis ovalis*, p. 48.

- Fig. 18. Male (?), seen from below,  $\times 84$ .  
    *a.* Siphon; *b.* Antenna; *c.* Mandible-palp?; *d.* Anterior foot-jaw;  
    *e.* Posterior foot-jaw; *f.* Swimming-foot.  
Fig. 19. Antennule,  $\times 210$ .  
Fig. 20. Antenna,  $\times 210$ .  
Fig. 21. Mandible-palp (?),  $\times 210$ .

*Artotrogus brevicaudatus*, p. 48.

- Fig. 22. Outline of animal, seen from below,  $\times 55$ .  
Fig. 23. Antennule,  $\times 210$ .  
Fig. 24. Siphon,  $\times 120$ .  
Fig. 25. Posterior foot-jaw,  $\times 120$ .  
Fig. 26. Abdomen,  $\times 140$ .