ON FRESH-WATER

ENTOMOSTRACA

FROM THE NEIGHBOURHOOD
OF SYDNEY,

PARTLY RAISED FROM DRIED MUD.

BY

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WITH 8 AUTOGRAPHIC PLATES

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KRISTIANIA
ALB. CAMMERMEYERS FORLAG
(LARS SWANSTRØM).

KRISTIANIA — CENTRALTRYKKERIET 1896.

INTRODUCTION.

As is well known, our earliest knowledge of Australian fresh-water Entomostraca is due to the Rev. R. L. King, who in the «Papers and Proceedings of the Royal Society of Van Diemen's Land» has published some interesting treatises on that part of the fauna. His investigations were chiefly restricted to the environs of Sydney, and showed indeed that part of the country to be rather rich in Entomostraca, some of which exhibited a very close relationship to well-known European species, though the greater number of them were regarded as specifically distinct. As the descriptions and figures given by Mr. King do not always admit of our fully recognizing the species, I was very anxious to obtain some of the native forms for a closer examinination, and for this purpose applied to two well-known naturalists of the country, Prof. Ramsay and Mr. Th. Whitelegge. Both these gentlemen readily complied with my request, and furnished me with a rather interesting material, the working out of which has been of great interest to me. In 1888, Prof. Ramsay kindly sent me a tube containing a sample taken from the Waterloo swamps near Sydney, and in the succeeding year, I published in the Transactions

of the Scientific Society of Christiania a short account of the contents of the tube. Some years afterwards, several additional samples preserved in spirit were kindly forwarded to me by Mr. Whitelegge, who collected them from several places in the neighbourhood of Sydney, and recently a number of samples of dried mud have also been kindly sent to me by the same gentleman. With this mud I have made, in the course of the past summer, a series of hatching experiments, and have thereby been enabled to examine the greater part of the species also in the living state. Of the Phyllopoda I have already in this Journal given a detailed account accompanied by autographic plates, and propose now to give a similar account of the other Entomostraca. The number of species examined amounts to no less than 42 in all, 26 of which have been examined in the living state. As several of these species have already been described and figured in detail by the auther in previous papers, some from the northern part of the country, some from New Zealand, these forms will be only briefly mentioned in the present paper, whereas descriptions and figures will be given of the remaining species.

The plates accompanying this paper have been prepared with the greatest care by the autographic process, and I am glad to see that the printing of the plates has been more successfully accomplished than has been the case with the plates of some of my recent papers.

Cladocera.

Fam. Daphnidæ.

Gen. Daphnia, Müller.

1. Daphina carinata, King.

(Pl. 1.)

Daphnia carinata, King, Papers & Proceedings Roy. Soc. Van Diemen's Land, Vol. II, Part. II, p. 246, Pl. I, p. 253, Pl. VI. A.

Specific Characters.—♀ Shell, seen laterally, somewhat varying in shape, being in some specimens oblong oval and narrowed posteriorly, in others comparatively broader, rounded quadrangular, spine generally rather long and more or less obliquely upturned, denticles of the dorsal margin extending nearly to the cervical region. Head distinctly carinated throughout, the carina being more or less developed, and thereby causing the lateral aspect of the head to be somewhat variable, though it always appears rounded in front; rostrum acute, not deflexed; fornix terminating on each side in a spiniform corner. Eye of moderate size. Antennulæ very small, scarcely projecting beyond the shell of the head. Tail conically tapering, with the posterior edge perfectly straight, anal denticles about 12 on each side, rather small

and subequal; terminal claws comparatively short, without any secondary denticles. Ephippium produced anteriorly to a narrow stripe, egg-ampullæ obliquely disposed. Length, without the spine, from 3 to 4 1/2 mm.

Remarks. The present form, first described by Mr. King, is closely allied to the New Zealand species *D. Thomsoni*, G. O. Sars, though differing in some particulars, so that it should more properly be regarded as specifically distinct. As Mr. King observes, it is, however, a very variable species. The crest of the head, from which the species has been named, seems indeed to vary considerably in development, thereby giving the head a somewhat different appearance in specimens from different localities, as shown in the figures here given. Mr. King has figured a very extreme variety, in which the crest even forms a strongly curved lamina projecting from the cervical region. The shape of the shell itself would also seem to be subject to some variableness, according to locality, perhaps also according to the season. Notwithstanding this great variableness, there are to be found certain characters common to all the varieties, by which this species may be readily distinguished from the New Zealand form. Thus the rostrum is never, as in that form, deflexed, but forms always the immediate continuation, of the ventral edge of the head. The shell-spine in all the individuals I have examined, is considerably longer than in *D. Thomsoni*, and, as a rule, also more upturned. Moreover, the denticles of the dorsal margin of the shell are continued in front as far as the cervical region, whereas in the New Zealand form they are restricted to the posterior half only of this margin. Finally, the tail is more regularly conical in form, and the terminal claws comparatively much shorter.

Description of the female.

a. *Typical form.*

(Pl. 1, figs. 1, 2).

This form, or variety, agrees closely with that described and figured by Mr. King as the «common form», and is probably derived from the very same locality as the latter.

The length of the largest specimens examined measures, without the spine, 4,70 mm.; but the greater number of the specimens are considerably smaller, though ovigerous.

The form of the shell, when seen laterally (fig. 1), is oblong oval, and considerably narrowed posteriorly towards the base of the spine, with the dorsal margin evenly convex in the middle, and forming anteriorly, in the cervical region, a very slight concavity. The spine, which issues from near the middle of the posterior extremity, is rather elongated, exceeding half the length of the shell, and is perfectly straight, but somewhat upturned.

The head appears considerably narrower than the shell, and somewhat irregularly rounded in front, with a slight indication of an angle in the ocular region. Its ventral edge is somewhat oblique, and forms a perfectly straight line as far as the tip of the rostrum, which is accordingly not deflexed, though terminating in a very acute point. The dorsal crest, the limits of which are shown by the insertion of the muscles moving the antennæ, is not very largely developed, though distinct all round the head. The fornix appears, in the lateral view of the animal, as a curved elevated line extending from the ocular region to the point where the valves take their origin, and in this place projecting as a spiniform corner. The posterior half of the free edges of the valves is closely denticulated, the denticles

being continued, as usual, along the lower edge of the shell-spine to its tip. The spine, moreover, exhibits 2 lateral and one dorsal row of similar denticles, the dorsal row being continued in front along the dorsal margin of the shell as far as the cervical region. The sculpture of the shell is the usual one, consisting of 2 sets of curved striæ crossing each other at nearly right angles.

The eye is of moderate size, and placed somewhat within the anterior edge of the head, at its junction with the ventral one. It exhibits a number of distinct crystalline bodies projecting from the dark pigment. The ocellus is extremely minute, punctiform, and located at some distance behind the eye, at the inferior end of the cerebral ganglion.

The antennulæ, as in *D. Thomsoni*, are very small, and scarcely project beyond the shell of the head, except with their apical bundle of olfactory papillæ.

The antennæ are constructed in the usual manner, and have the natatory setæ densely plumose.

The tail exhibits dorsally the usual curved lappets, and has the terminal part (see fig. 2) comparatively short and conically tapering distally, with the posterior edge perfectly straight and densely hairy in its upper part. The anal denticles are rather small and of uniform length, about 12 on each side. The terminal claws are comparatively much shorter and stouter than in *D. Thomsoni*, and are destitute of any trace of secondary denticles, though a delicate ciliation may be observed along their concave edge.

The cæcal appendages of the intestine are of moderate size, and but slightly sigmoid.

The ova in the matrix, in large specimens, are very numerous and of comparatively small size.

b. *Var. intermedia.*

(Fig. 3).

In this variety, which is of somewhat smaller size, measuring in length, without the spine, 3,35 mm., the head appears comparatively larger in proportion to the shell, with the dorsal crest more developed. The shell is less narrowed posteriorly, and the spine issues considerably above the longitudinal axis, being obliquely upturned.

All the specimens of this variety, which I have had an opportunity of examining, were provided with ephippia, and accordingly belonged to the later generations.

The ephippium is rather narrow and, seen laterally, of a somewhat fusiform outline, with the anterior extremity prolonged into a narrow stripe extending along the cervical part of the shell and, like the whole dorsal margin, densely denticulated. The egg-ampullæ are rather small and obliquely disposed, exhibiting a very dark hue, whereas the remaining part of the ephippium is opaque whitish.

c. *Var. magniceps.*

(Fig. 4).

This variety, which attains a length, without the spine, of 3½ mm., differs considerably in its outward appearance from the two preceding ones, though evidently belonging to the same species. The shell is comparatively shorter and broader, and exhibits a rounded quadrangular form, with the dorsal margin nearly straight, and not defined from the head by any perceptible sinus. The spine, which issues far above the longitudinal axis, is considerably upturned, and about half the length of the shell. The head is exceedingly

large, fully as broad as the shell, and has the dorsal crest strongly developed, its inner limit being well indicated by the insertion of the antennal muscles. The edge of the head forms a quite even and uninterrupted curve from the cervical region to the tip of the rostrum. The specimens examined were laden with numerous small eggs in the matrix, and would accordingly seem to have belonged to the earlier generations. In the structure of the fornix, tail and various appendages, no differences could be detected between this and the 2 preceding varieties.

Observations. Some few specimens of the present species were successfully hatched in my aquaria from the mud received, but none of them arrived at full maturity, apparently owing to the excessive increase in the same aquaria of another form, a species of Moina. I am therefore not able to say into which variety these specimens would have developed. The specimens, which had the spine of the shell very much elongated and somewhat upwards curved, were watched for some time in the aquaria. They kept themselves constantly near the bottom, moving along it in the usual somewhat jumping manner.

Occurrence. According to Mr. King, the present species is rather common in the environs of Sydney. The localities for the typical form are not enumerated, whereas for the 4 varieties he figures, none of which agrees with thoes here described, the localities were recorded. Of the typical form several well-preserved specimens were contained in the sample first sent me for examination by Prof. Ramsay. This sample was taken on the 13th August, 1888, from the Waterloo swamps. The variety *intermedia* was found in a sample taken by Mr. Lea from some ponds «Near Hay». Finally, the variety *magniceps* occurred, though rather sparsely, in a sample taken by Mr. Whitelegge from Waterholes off Bourke Street, Waterloo. Out of the continent of Australia, this species has as yet not been recorded.

Gen. Simocephalus, Schoedeler.

2. Simocephalus australiensis (Dana).

Daphnia australiensis, Dana, United St. Expl. Exp. Crust. II, p. 1271, Pl. 89, figs. 4, a—e.

Simocephalus australiensis, G. O. Sars, Addit. Notes on Austral. Cladocera raised from dried mud, p. 15, Pl. 2, figs. 1—5.

Of this form, described and figured in detail by the author in the above mentioned paper, some specimens were collected by Mr. Whitelegge from the Marubra Swamp near Sydney.

Distribution. Queensland, Knysna (G. O. Sars).

3. Simocephalus Elisabethæ (King).

Daphnia Elisabethæ, King. l. c. p. 247, Pl. II.

Simocephalus Elisabethæ, G. O. Sars, l. c. p. 22, Pl. 2, figs. 6, 7.

As pointed out in my above mentioned paper, Mr. King has most probably confounded this and the preceding species. It is therefore not possible to decide with certainty the localities where the present species was found by that author. A few not very well preserved specimens of this form were found in one of the samples sent me

by Mr. Whitelegge. It was taken from a pond off Botany Road, near Waterworks Bridge, on the 6th April. 1895.

Distribution. Queensland (G. O. Sars).

4. Simocephalus acutirostratus, (King).

(Pl. 2, figs. 1—3).

Daphnia Elisabethæ, var. *acutirostrata*, King, l. c. p. 254, Pl. VI, C.

Specific Characters. Shell, seen laterally, oblong oval, terminating posteriorly in a rather prominent, obtusely conical prominence, slightly denticulated at the tip, and extending somewhat above the longitudinal axis, dorsal margin forming a perfectly even curve throughout. Head comparatively small, procumbent, with the front produced into an acute deflexed projection, ventral edge straight, obliquely ascending, rostral projection small, deflexed. Eye of moderate size; ocellus very small, punctiform. Tail rather broad, forming, above the anal sinus, a gibbous expansion, anal denticles about 12 on each side, terminal claws with a series of well-marked secondary teeth. Length attaining 3 mm.

Remarks. This form has been recorded by Mr. King as only a variety of his *Daphnia Elisabethæ*. It is, however, quite certainly, as justly pointed out by Mr. Schoedeler, a very distinct species, exhibiting, as it does, several well-marked differences from all the other known species of the genus. The specific name *acutirostratus* is somewhat inappropriate, since it is not the rostrum, but the front, which is acutely produced. According to the laws of priority, however, this name, as the older one, must be preferred to that proposed by Schoedeler, viz., *paradoxus*.

Description of the female.

The length of the largest specimens examined is about 3 mm., and this form accordingly grows to a rather large size, as compared with the other species of the genus.

The shell, as in the other species, is rather tumid, and somewhat navicular in shape. Seen laterally (fig. 1), it exhibits an irregular oval, or oblong sub-rhomboidal form, with the posterior extremity remarkably produced, and forming a rather large, obtusely conical prominence extending somewhat above the longitudinal axis of the body. The prominence is not defined above by any distinct sinus, and exhibits at the tip a number of small appressed denticles. The dorsal margin of the shell is quite evenly convex throughout, and continuous with that of the head, though, as usual, a small indentation may be traced between the two in the cervical region. The inferior edges of the valves are greatly bulging in front, and posteriorly join the obliquely ascending posterior edges by an even curve.

The head (see also fig. 2) is comparatively small and procumbent, and is highly distinctive by the production of the front into a very conspicuous acute, deflexed projection, resembling a rostrum. Behind the latter, the ventral edge ascends obliquely and quite evenly to the small, deflexed, true rostrum. The fornix is moderately prominent, and of the usual appearance, joining the valvular part of the shell at a very acute angle.

The shell is sculptured in the usual manner by oblique, partly anastomosing striæ, running parallel to the posterior edges; and exhibits inside, at some distance from the inferior edges, a ciliated ridge.

The eye (see fig. 2) is not very large, and exhibits a number of well-defined crystalline bodies projecting from the dark pigment.

The ocellus (ibid.) is very small, punctiform, and occurs near the insertion of the antennulæ.

The latter appendages (ibid.) exhibit the usual structure, and this is also the case with the antennæ (see fig. 1).

The tail (fig. 3) is remarkably broad, and differs from that in other species by the production of the posterior edge, above the anal sinus, to a nearly rectangular gibbous expansion. The anal sinus itself is defined above by a rather small, obtusangular corner, and is armed on each side with about 12 denticles, successively rapidly increasing in length distally. The terminal claws are nearly straight, and each armed in their basal part with a regular, comb-like series of well-marked secondary teeth.

The number of eggs in the matrix is often very great, amounting to more than 50 in all.

Young specimens have the acute projection of the front as distinct as in the adults, and only differ in their smaller size, and in the dorsal margin of the shell not being convex, but nearly straight.

Occurrence.—Mr. King found this form in ponds at Denham Court. In one of the gatherings kindly sent me by Mr. Whitelegge, and taken from Waterholes at Bourke Street, this species occurred rather abundantly, and it was also found in another sample probably from the same locality.

Though some ephippia apparently of this form were detected in the mud sent me from the said place, I did not succeed in hatching this form in my aquaria. As, however, the spirit-specimens sent were in a very good state of preservation, a minute examination could be instituted, especially by mounting the specimens in canada balsam, whereby a sufficient transparency of the body could be obtained.

5. Simocephalus gibbosus, G. O. Sars, n. sp.

(Pl. 2, figs. 4—6).

Specific Characters.—♀ Shell, seen laterally, obliquely oval, widening posteriorly, and terminating with a comparatively short and blunt median prominence; dorsal margin for the greater part of its length, almost straight, posteriorly, however, abruptly curved, forming a large and very conspicuous, gibbous expansion just above the median prominence, edges of the expansion closely denticulated. Head of moderate size, less procumbent than in the preceding species, front narrowly rounded, ventral edge scarcely ascending, and slightly convex in the middle, rostral projection almost obsolete. Eye comparatively larger than in the preceding species; ocellus prolonged anteriorly into a narrow stripe. Tail less broad, posterior edge above the anal sinus scarcely expanded; anal denticles 10—12 on each side; terminal claws quite smooth. Length of adult female 2 mm.

Remarks.—This new species is allied to the European *S. vetulus*, and has a similarly formed ocellus, but is at once distinguished by the very conspicuous gibbous expansion of the dorsal face posteriorly, which gives the shell a peculiar oblique shape. This expansion is even traceable in quite young specimens.

Description of the female.

The length of fully adult, ovigerous specimens does not exceed 2 mm., and this form is accordingly rather inferior in size to the preceding one.

Trykt den 9de Juni 1896.

Seen laterally (fig. 4), the shell exhibits a somewhat irregular, obliquely oval form, being gradually expanded posteriorly, and terminates in a well-defined, though rather short and blunt prominence, which extends in the direction of the longitudinal axis of the body. The dorsal margin appears, throughout the greater part of its length, almost straight; but quite posteriorly it makes an abrupt bend, so as to form here a greatly projecting gibbous expansion, extending just above the median prominence, and defined from it by a well-marked sinus. The edge of the expansion is coarsely denticulated, the denticles being also continued around the median prominence The inferior edges of the valves appear somewhat less bulging in front, and join the oblique posterior edges by a greater curve.

The head (see also fig. 5) is comparatively larger than in the preceding species, and less procumbent, being, as usual, defined from the shell above by a small indentation. Its dorsal margin is slightly curved, and joins the ventral edges immediately, without any intervening frontal projection, the front itself being narrowly rounded. The ventral edge is slightly convex in the middle, and scarcely ascending, and the rostral projection is rather indistinct, and not, as usual, deflexed. The fornix exhibits the usual appearance.

The eye (see fig. 5) is comparatively somewhat larger than in the preceding species, and located just within the front.

The ocellus (ibid.) exhibits an appearance similar to that found in *S. Elisabethæ*, and in the European species *S. vetulus*, being drawn out in front to a narrow stripe.

The tail (fig. 6) is not nearly so broad as in *S. acutirostratus*, the posterior edge above the anal sinus not being, as in that species, gibbously expanded, but only very slightly convex. The defining upper corner of the anal sinus is, on the other hand, more prominent and nearly rectangular. The anal denticles are 10—12 on each side, increasing, as usual, rapidly in length distally. The terminal claws are perfectly smooth, without any trace of secondary teeth.

The ova in the matrix are comparatively larger than in the preceding species, though sometimes present in a rather considerable number.

Occurrence.—Of this pretty species a number of specimens were collected by Mr. Whitelegge in the Centennial Park, near Sydney.

Gen. Moina, Baird.

6. Moina propinqva, G. O. Sars.

Moina propinqva, G. O. Sars, On some Australian Cladocera raised from dried mud, p. 29, Pl. 5, figs. 4, 5; Pl. 6.

Of this species, which in its general appearance strongly recalls the European *M. braciata*, some few specimens were collected by Mr. Whitelegge from waterholes off Bourke Street.

The same form was also raised in one of my aquaria, from mud derived from the same locality. It did not, however, multiply to nearly such an extent as the 2 succeeding species.

Distribution.—Queensland (G. O. Sars).

7. Moina australiensis, G. O. Sars, n. sp.

(Pl. 3.)

Specific Characters.—Shell of the usual appearance, varying in female considerably in form, according to the degree of distention of the matrix. Head in female not very large, and somewhat procumbent, being evenly vaulted above, with a very slight, though distinct sinus above the eye, front not much produced and obtusely rounded, ventral edge but very slightly convex at the insertion of the antennulæ. Head in male comparatively much larger, sub-erect, and less strongly vaulted above, frontal part obtusely truncated, ventral edge straight. Eye of moderate size. Antennulæ in female comparatively short, subfusiform, in male about the length of the head, and armed at the tip with 4 strong claws. First pair of legs in female with the sub-apical seta simple, ciliated; those in male having, in addition to the usual claw, an unguiform spine and a long terminal seta. Caudal claws quite smooth. Ephippium with 2 egg-ampullæ placed obliquely transversally. Body pellucid, in female with a more or less distinct orange hue. Length of adult female 1,30 mm., of male 0,80 mm.

Remarks.—This form exhibits several points of agreement with the European species *M. paradoxa*, Weismann, and indeed at first I belived it to be the very same species. Being however acquainted with another Australian species, which exhibits a similar agreement, and having instituted a closer comparison between the European species and these 2 Australian forms, I am now induced to regard them as being specifically distinct. From *M. propinqva*, the present species is easily distinguished by the rather different form of the head, the structure of the 1st pair of legs in the male, and by the ephippium having 2, instead of a single egg-ampulla.

Description of the female.

The largest specimens examined attain a length of 1,30 mm., and this form accordingly grows to a somewhat larger size than *M. propinqua*, which, as a rule, does not exceed a length of 1 mm.

The general form of the body (see fig. 1) is that characteristic of the genus, the head being very sharply marked off from the shell by a deep dorsal depression.

The form of the shell appears rather variable, according to the degree of distention of its dorsal part with ova or embryos. Sometimes this part is quite enormously distended, so as to form an almost globular expansion, sharply defined from the valvular part of the shell, and this is generally the case with all the individuals of the earlier generations. The valvular part of the shell, however, preserves its shape unaltered, in all specimens being comparatively small, so as not fully to obtect the tail, a greater part of which is always seen to project freely beyond the shell posteriorly. At the junction between the dorsal and valvular parts, the shell projects posteriorly as a short and obtuse prominence, below which the posterior edges appear slightly incurved. The inferior edges of the valves are nearly straight, and join by a perfectly even curve both the anterior and posterior edges. They are clothed with small marginal hairs, which are more distinct in the anterior part, gradually disappearing behind.

The head is comparatively small and somewhat procumbent, without any trace of a dorsal crest, being evenly vaulted above. Just above the ocular region, a slight sinus may be traced, but this sinus is not nearly so pronounced as in *M. propinqva*. The frontal, or ocular part is but slightly

prominent, and is evenly rounded; and the ventral edge of the head forms only a slight convexity at the insertion of the antennulæ, without being defined by any perceptible notch from the base of the labrum. Of the fornix, only a slight trace is found as a somewhat elevated ridge above the base of the antennæ.

The eye is of moderate size, and provided with a number of well-defined crystalline bodies. The ocellus, as in the other species of the genus, is wholly absent.

The antennulæ (fig. 2) are comparatively short, scarcely exceeding half the length of the head, and exhibit a somewhat fusiform shape, being distinctly dilated in the middle. They are, as in the other species, freely mobile, and are clothed posteriorly with delicate cilia. Anteriorly each antennula carries a single sensory bristle, occurring somewhat nearer to the base than to the tip, and the latter has a bundle of very small olfactory papillæ.

The antennæ are powerfully developed, and of the structure characteristic of the genus. The scape is very massive and strongly muscular, and is provided near the base outside with 2 juxtaposed and rather long sensory bristles, which, especially in the dorsal or ventral views of the animal, are very conspicuous; at the end, another sensory bristle is seen projecting between the bases of the rami. Both the outer part of the scape and the rami are densely hairy, and the natatory setæ finely ciliated.

The 1st pair of legs (fig. 3) are constructed in the very same manner as in the European species, *M. brachiata*, and differ markedly from those in *M. paradoxa*, by the subapical seta being quite simple and finely ciliated, like most of the other setæ, whereas in *M. paradoxa*, according to

the statement of Prof. Weissmann, this seta is very strong, spiniform, and coarsely denticulated anteriorly.

The tail agrees in its structure with that in most other species, its outer part beyond the anal opening (fig. 4) being conically tapered, and provided on each side with 10—12 denticles, the outermost of which is bidentate, whereas the others are extremely delicate, squamiform and finely ciliated on both edges. The terminal claws are perfectly smooth, without any trace of secondary teeth.

The ephippium (fig. 5) is of an oval or somewhat semilunar form, and has the surface very coarsely reticulated. It contains, as in *M. paradoxa*, 2 egg-ampullæ, which are somewhat obliquely disposed, the one behind the other. Before the ephippium is detached from the shell, however, the 2 winter-eggs occupy a rather different place, being, as shown in the succeeding species (see Pl. 4, fig. 2), juxtaposed in the anterior part of the matrix; and in a lateral view of the animal it therefore appears as if only a single ovum were present.

The adult male (figs. 6, 7) is rather inferior in size to the female, scarcely exceeding a length of 0,80 mm., and exhibiting a very different appearance.

The shell is much narrower, its dorsal part not being at all expanded; and the posterior extremity appears, in the lateral view of the animal, obtusely truncated, forming above almost a right angle. The inferior edges of the valves are densely clothed with fine hairs, which, in their anterior part, assume a fur-like appearance.

The head looks very different from that in the female, being much longer and more erect. It gradually tapers towards the front, which appears obtusely truncated and defined above by a very slight sinus. The inferior edge of

the head is perfectly straight and horizontal, whereas the upper one is obliquely ascending and, but very slightly convex.

The antennulæ, which issue from the most anterior part of the head, are greatly developed, being fully as long as the head. They are very mobile, but, as a rule, extended obliquely anteriorly, with the terminal part more or less incurved (see fig. 7). Near the base they each form a somewhat genicular bend, and at this place 2 unequal sensory bristles are seen to project anteriorly. The outer part of the antennulæ is rather narrow, and nearly cylindric, and terminates with 4 strongly curved hooks, between which a small bundle of olfactory papillæ is traceable (see fig. 8).

The 1st pair of legs (fig. 9) are, as usual, transformed into powerful grasping organs. They closely resemble in structure those in the male of *M. paradoxa*, as figured by Prof. Weismann, each having a rather long, setiform appendage extending beyond the claw, and terminating in a fine hooked point. In addition, a thin lamella is seen projecting inside the claw, having 3 apical bristles, the anterior of which is curved in a hook-like manner, and devoid of cilia.

The tail does not seem to differ essentially in structure from that in the female.

The testes (see fig 6 & 7) are confined to the posterior part of the trunk, appearing as 2 somewhat twisted bags, which extend along the sides of the intestinal tube. They are each continued into a narrow duct, which enters the tail, and debouches at the sides of the anal orifice. Viewed by a high magnifier (fig. 10), they are found to be filled with clear rounded cells, very densely accumulated in the anterior, dilated part of the bags. It often happens, when a male specimen is examined for any length of time under

the microscope, that some of the zoosperms are poured out from the genital openings, and in such cases I have always found them to be simple, rounded, cellular bodies (fig. 11), never showing any approach to the peculiar vermiform shape described by Prof. Weismann in the male of *M. paradoxa*.

In living specimens of both sexes, the body is very pellucid, and in the male almost colourless. In the female, it generally exhibits a more or less distinct orange tinge, and this would seem to be invariably the case with individuals of the earlier generations, whereas those of later generations, as a rule, become more pale in colour.

The «summer-eggs» are at first, when received in the matrix, very small and nearly colourless, with only a very small quantity of nutritive yolk. They, however, rapidly increase in size during the development, imbibing, as first stated by Prof. Leydig, a nourishing fluid contained in the cavity of the matrix, and secreted from a dense cellular layer on the back of the parent animal. The «winter-eggs» are considerably larger, and of a brick-red colour.

Observations.—Of the present form, numerous specimens developed in my aquaria, and in some of them multiplied in quite an astonishing manner, so as at last to fill up the aquaria with myriads of individuals. The earlier generations consisted exclusively of female specimens; but after the lapse of some time, the characteristic ephippial formation was beginning, and at that time male specimens made their appearance in rather large numbers. After the ephippia were deposited, some of the females again became laden with summer-eggs, though generally not in such great numbers as in the individuals of the earlier generations. From that time, the males gradually diminished in

numbers, and at last scarcely a single male specimen was to be detected, though the females were still present in great numbers, multiplying in the usual parthenogenetical manner. In some of my aquaria, a 2nd bisexual period was observed, and thereby the «polycyclar» character of this form ascertained.

In habits, this form agrees with the other species of the genus. The movements of the animal are rather rapid, and effected by short abrupt jerks, whereby the body generally assumes a somewhat prone attitude. The males, as usual, are still more agile, and were often seen eagerly to pursue the females. I also happened several times to observe the male getting a rather firm hold of the female, embracing with his powerful antennulæ the lower part of her shell, and at the same time inserting his prehensile 1st pair of legs within the edges of her valves.

Occurrence.—The mud, from which this species was raised, was taken by Mr. Whitelegge from waterholes at Bourke Street, opposite Lachlan Street, and off Botany Road, near Waterworks Bridge. A spirit sample taken from the same localities likewise contained numerous specimens of the same species. Moreover, the greater number of the specimens contained in the sample first received from Prof. Ramsay, and taken from the Waterloo Swamps, turned out, on a closer examination, to belong to the said species.

8. Moina tenuicornis, G. O. Sars, n sp.

(Pl. 4.)

Specific Characters.—Very like the preceding species, but differing rather markedly in the shape of the head, which does not exhibit any trace of a sinus above the eye, and moreover in the female, forms below, at the insertion

of the antennulæ, a very conspicuous, rounded prominence, defined from the labrum by a deep notch. Eye comparatively larger than in that species. Antennulæ in female comparatively much longer and narrower, sublinear in form; those in male considerably exceeding half the length of the body. First pair of legs in both sexes of a simular structure to that in the preceding species. Terminal claws of tail armed at the base with a well-marked, comb-like series of secondary teeth. Ephippium with 2 transversely disposed egg-ampullæ. Length of adult female 1,20 mm., of male 0,70 mm.

Remarks.—Though very nearly allied to the preceding species, as also to the European *M. paradoxa*, this form may at once be distinguished from both of them by the form of the head in the female, the remarkably elongated and narrow antennulæ, and finally by the terminal claws of the tail being distinctly denticulated at the base, like those in *M. brachiata*.

Description of the female.

The length of the largest specimens is 1,20 mm., and this form is accordingly but little inferior in size to the preceding one.

The general form of the body (see fig. 1) agrees rather closely with that in *M. australiensis*. On a closer comparison, however, the head is found to differ very markedly in shape, being quite evenly vaulted dorsally, without exhibiting any trace of a sinus above the eye The front is obtusely rounded and, as in the preceding species, but little prominent. On the other hand, the inferior part of the head is produced, at the insertion of the antennulæ, to a rather conspicuous, rounded prominence, which is defined

behind by a deep notch, giving the head, in a lateral view of the animal, a physiognomy rather different from that in *M. australiensis*.

In the form and structure of the shell, scarcely any essential difference is to be found from that in the said species, excepting that perhaps the inferior edges of the valves are more densely setiferous.

The eye is comparatively larger than in *M. australiensis*, almost completely filling up the frontal part of the head, and the crystalline bodies seem also to be more numerous.

The antennulæ (fig. 3) are distinguished by their unusual length, being comparatively nearly twice as long as in the preceding species. They are very narrow, sublinear in form, and provided behind with scattered, delicate hairs. The sensory bristle of the anterior edge occurs much nearer to the base than to the tip, being placed at about the end of the first third part of the length of the antennula.

The antennæ do not exhibit any essential difference from those in the preceding species; the 1st pair of legs (fig. 4) too are constructed in the very same manner, the subapical seta being, as in that species, quite simple.

The tail (fig. 5) likewise looks rather similar. But, on a closer examination, the terminal claws are found to differ essentially in being each provided at the base with a well-marked, comb-like series of secondary teeth (see fig. 6).

A similar armature, as is well known, is found in *M. brachiata*, whereas in the other European species, *M. paradoxa*, the claws are quite smooth, as in *M. australiensis* and *M. propinqva*.

The ephippium (fig. 7), as in the preceding species, always contains 2 egg-ampullæ, which in this form, however, are placed more transversely, or in a manner similar to that

figured by Prof. Weismann in the ephippium of *M. paradoxa*. Before the ephippium is detached from the shell, the 2 winter-eggs occupy (see fig. 2) a similar juxtaposed situation in the matrix to that observed in the preceding species.

The adult male (fig. 8) scarcely exceeds a length of 0,70 mm., and on the whole closely resembles the male of *M. australiensis*, though the antennulæ appear still more elongated, considerably exceeding half the length of the body. The 1st pair of legs are constructed in the very same manner as in the male of the said species, and the zoosperms in this form also are represented by simple, clear, nucleated cells.

As in the preceding species, the body in both sexes is highly transparent, especially in the male. In the female generally a faint bluish violet tinge, more rarely changing to reddish, may be observed. The winter-eggs are brick-red.

Observations.—This form was also raised in considerable numbers in some of my aquaria, and was watched during numerous succeeding generations. All the specimens exactly agreed with each other, as to the form of the head, the slender antennulæ, and the denticulated claws of the tail. Its habits are much as in the preceding species.

Occurrence.—The mud that yielded this species, was taken by Mr. Whitelegge from a pond at the corner of Bourke Street and Botany Road. A spirit sample from the same place contained numerous specimens of the same species, exactly agreeing with those raised here in Christiania.

Gen. Moinodaphnia, Herrick.

Syn. Paramoina, G. O. Sars.

9. Moinodaphnia Macleayii (King).

Moina Macleayii, King, l. c., p. 251, Pl. V.

A solitary, somewhat imperfect female specimen, apparently of this form, was found in a sample taken by Mr. Whitelegge from the Marubra Swamp. Mr. King collected this form in a pond near Elisabeth Ray.

Fam. Lyncodaphnidæ

Gen. Macrothrix, Baird.

10. Macrothrix spinosa, King.

Macrothrix spinosa, King, l. c. p. 256, Pl. VI E.

Macrothrix spinosa, G. O. Sars. Additional Notes on Austr. Cladocera raised from dried mud, p. 25, Pl. 3.

Some specimens of this form, described and figured in detail by the author in the above-quoted paper, were found in a sample taken by Mr. Whitelegge from a pond near Sydney.

Distribution.—Queensland (G. O. Sars).

Gen. Ilyocryptus, G. O. Sars.

11. Ilyocryptus sordidus (Lièvin).

(Pl. 5, figs 1—3).

Acanthocercus sordidus, Lièvin, Die Branchiopoden der Danziger Gegend: Neueste Schriften der naturf. Gesellsch. in Danzig, p. 34, Pl. VIII, figs. 7—12.

In one of my aquaria there developed several specimens of an *Ilyocryptus*, which I am unable to distinguish from the well-known European species *I. sordidus*, Lièviu. In order to show the identity of both forms, I have given on the accompanying plate a figure of a full-grown female specimen, together with more highly magnified detail figures of one of the antennulæ and of the tail. The specimens, which exhibited a blood-red colour, did not exceed a length of 0,57 mm.

As in most other species of the genus, the shell is not completely cast off by the several exuviations of the animal, and in fully grown specimens (fig. 1), therefore each valve has the appearance of being composed of a more or less considerable number of superposed valves of different sizes, most of them still exhibiting their marginal setous armature. It is chiefly on this account that the animal is generally found so densely covered with mud as to be scarcely recognizable. Indeed, the mud adheres so firmly to the numerous rows of bristles, that it is a matter of great difficulty to cleanse the shell sufficiently for a minute examination. The specimens were only found on the bottom, more or less deeply buried in the loose muddy deposit, through which they moved very slowly by the aid of the antennæ and the powerful tail. I have never seen the animal make even the slightest attempt to lift itself from the bottom, and in this respect it differs rather markedly from the 2nd Australian species, *I. longiremis*, which is by no means devoid of swimming power.

Occurrence.—The specimens were raised from the same parcel of mud, which yielded the above-described *Moina tenuicornis*. As above stated, this mud was derived from a pond at the corner of Bourke Street and Botany

Road. In a sample taken by Mr. Whitelegge from another pond off Botany Road, near Waterworks Bridge, some few specimens of the same form were contained. Moreover, the author has raised this species from mud collected in China.

Fam. Lynceidæ.

Gen. Chydorus, Baird.

12. Chydorus Leonardi, King.

(Pl. 5, figs. 4, 5).

Chydorus Leonardi, King, l. c. p. 258, Pl. VII C.

Syn.: Chydorus minor, Lilljeb. M. S.

This form, first described by Mr. King, is undistinguishable from a small *Chydorus*, which is rather common in Norway, as also in Sweden, and for which Prof. Lilljeborg has proposed the name of *Chydorus minor*. As shown by the figures here given, it is very nearly allied to *C. sphæricus* (Müll.), but is of much smaller size, and without any trace of the reticulation of the shell characterising that species. The specimen here figured, which measured in length 0,25 mm., was picked up from a sample taken from the Waterloo Swamps, near Sydney.

Of the same form numerous specimens also developed in some of my aquaria, and continued to live and propagate during the whole season. They were rather active, moving about in the water in a somewhat revolving manner, at times affixing themselves to the walls of the aquarium or to the plants growing in it.

Occurrence.—Mr. King found this form in several places around Sydney: near Wavely Mills; the waterfall,

St. Leonard's; South Creek; Denham Court. To these localities may now be added the followings: Waterloo Swamps; pond opposite Lachlan Street; off Botany Road, near Waterworks Bridge.

In all probability, the species is distributed all over Europe, Asia, Africa and America, being a true cosmopolite.

13. Chydorus globosus, Baird.

(Pl. 5, figs. 6—7).

Chydorus globosus, Baird, Brit. Entomostraca, p. 127, Pl. XVI, fig. 7.

Chydorus augustus, King, l. c. p. 258, Pl. VII B.

There cannot, I believe, be any doubt that this is the true *Chydorus augustus* of King. This form however, as shown by the figures given on the accompanying plate, is undistinguishable from the well-known European species *C. globosus* of Baird, and, as the name given by Baird is much the older of the two, it ought to be retained for the species. The solitary specimen here figured, which measured 0,65 mm. in length, was found in a sample from the Centennial Park. Mr. King collected the species from a pond on the Road to Botany Bay.

Gen. Pleuroxus, Baird.

14. Pleuroxus inermis, G. O. Sars, n. sp.

(Pl. 5, figs. 8, 9).

Specific Characters.—♀ Shell, seen laterally, of an irregularly rounded form, and narrowly truncated posteriorly, dorsal margin boldly curved, ventral somewhat protuberant in front, and nearly straight behind, infero-posteal corners

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rounded off, and without any trace of denticles. Head strongly procumbent, terminating in a long and sharply pointed rostrum. Surface of valves smooth, except in their anterior part, where they are sculptured with 10—12 very conspicuous, curved, transverse striæ, inferior edges densely ciliated. Ocellus much smaller than the eye. Tail nearly of uniform breadth, and obtusely truncated at the tip, posterior edge somewhat flexuous, post-anal angle very slight, ante-anal denticles extremely small, hair-like, terminal claws strong and curved, each with 2 secondary denticles at the base. Colour light corneous. Length of adult female 0,60 mm.

Remarks.—In a previous paper[1]) I have wrongly identified this species with *Chydorus augustus* of King, which, as above stated, is identical with *C. globosus*, Baird. The present form, which is a true *Pleuroxus*, is very closely allied to the European species *P. aduncus*, Jurine, and exhibits a very similar sculpturing of the valves, but differs in the more rounded form of the shell, and very markedly in the rounding off of the infero-posteal corners of the valves, where there is no trace of the denticles found here in all the other known species of the genus.

Description of the female.

The length of adult specimens measures 0,60 mm., and this form is accordingly of about the same size as the European species, *P. aduncus*.

The shell is moderately tumid, and, seen laterally (fig. 8), of a somewhat irregularly rounded form, the greatest breadth being but little inferior to the length, and occurring

[1]) On a small collection of Fresh-water Entomostraca from Sydney (Chr. Vid. Selsk. Forh. 1889) p. 5.

somewhat in front of the middle. It is narrowly truncated posteriorly, and strongly vaulted above, the dorsal margin forming a bold and rather even curve until the tip of the rostrum. The inferior edges of the valves are somewhat protuberant in front of the middle, and join the anterior edges by an abrupt curve; behind, they appear nearly straight, or very slightly convex in the middle, and ascend obliquely to the infero-posteal corners, which are evenly rounded off. The head is very procumbent, and, as in the other species of the genus, to a certain degree mobile, admitting of being bent in against the anterior part of the valves. It terminates in a long and sharply-pointed rostrum, which curves somewhat posteriorly, and projects considerably beyond the free edges of the valves. The fornix appears as an elevated sigmoid ridge, which joins the valves at a very acute angle.

The surface of the shell appears, in its greater part, quite smooth, without any perceptible reticulation. In the most anterior part of the valves, however, a very conspicuous sculpturing is traced, consisting of from 10 to 12 curved, transverse striæ, which run parallel to the anterior edges, and are very sharply marked. The inferior edges of the valves are throughout fringed with delicate bristles, which, especially in their posterior part, are rather conspicuous and finely ciliated. The infero-posteal corners are quite smooth, without the slightest trace of the strong denticles occurring here in other species.

The eye is of moderate size, and occupies its usual place.

The ocellus is scarcely half as large, and occurs much nearer to the eye than to the tip of the rostrum.

The antennulæ are short and thick, extending scarcely beyond the middle of the rostrum.

The antennæ are comparatively short, and of the usual structure.

The tail (fig. 9) is of moderate size, and almost of uniform breadth throughout, being obtusely truncated at the tip, with the posterior corner rounded off. The post-anal angle is but little prominent, and is obtuse. The posterior edge below it appears very slightly flexuous, being somewhat convex in the middle. The ante-anal denticles are very small, almost hair-like, and occupy the outer half of the edge, being continued around the distal corner. The terminal claws are rather strong and curved, having each 2 distinct secondary denticles at the base, not found in the European species *P. aduncus*.

As in most other Lynceidæ, the matrix never contains more than 2 ova or embryos, which are generally juxtaposed.

The body in living specimens is semi-pellucid, thus showing through the integuments several of the inner organs, especially the dark-coloured and twisted intestinal tube. It generally exhibits a yellowish or light corneous hue.

Observations.—Of this species some specimens were found in one of my aquaria, all of them females. They did not, however, multiply to any greater extent, and in the latter part of the summer, this form wholly disappeared. The animal is rather agile, moving quickly through the water in much the same manner as the species of *Chydorus*. Very often it was also seen clinging to the wall of the aquarium or to the plants growing in it.

Occurrence.—The mud, from which I raised this species, was taken by Mr. Whitelegge from a pond opposite Lachlan Street, Bourke Street; and in a sample from the same locality, a considerable number of specimens was contained. It also occurred in the sample first received from Prof. Ramsay, and taken from the Waterloo Swamps.

Gen. Alona, Baird.

15. Alona Whiteleggii, G. O. Sars, n. sp.

(Pl. 6, figs. 1, 2).

Specific Characters.—♀ Shell, seen laterally, oval quadrangular, but very slightly widening behind, dorsal margin evenly arcuate, ventral nearly straight, hind extremity somewhat obliquely truncated, with the upper corner obsolete, lower rounded off. Head somewhat procumbent, terminating in an acute rostrum. Surface of shell striated longitudinally, inferior edges densely ciliated. Ocellus almost as large as the eye. Tail rather large, lamellar, though scarcely widening distally, being obtusely truncated at the tip, post-anal angle almost obsolete, posterior edge below it very slightly convex, of ante-anal denticles about 15 pairs, each accompanied by a squamiform lateral denticle, terminal claws each with a rather strong secondary denticle at the base. Length of adult female 0,63 mm.

Remarks.—This form is somewhat intermediate in character between the European species, *A. qvadrangularis* and *oblonga*, without being referable to either of them. In size and sculpture it more resembles the first-named species, but the form of the shell and that of the tail is rather different, and agrees more with that found in *A. oblonga*. I have much pleasure in dedicating this beautiful species to Mr. Whitelegge, to whom I am indebted for the greater part of the material here treated off.

Description of the female.

The length of the specimen examined, which is a fully grown ovigerous female, measures 0,63 mm., and is accordingly somewhat inferior to that of both the above-named European species.

Seen laterally (fig. 1), the shell exhibits an oval quadrangular form, with the greatest breadth about in the middle. The hind extremity is obliquely truncated, and not nearly so broad as in *A. qvadrangularis*, and with the inferior corner the more prominent. The dorsal margin forms a perfectly even curve until the tip of the rostrum, and joins the hind edge without any distinct intervening angle. The inferior edges of the valves are nearly straight and horizontal, though slightly ascending in front to the anterior corners. Behind, they join the posterior edges by a rather sharp but perfectly even curve. The head is somewhat procumbent, not nearly so erect as in the 2 European species, and terminates in an acute, somewhat hooded rostrum.

The surface of the shell is sculptured with well-marked, and rather closely set, longitudinal striæ, about 20 on each side. These striæ are more conspicuous in the posterior part of the shell, disappearing gradually in front. The inferior edges of the valves are throughout fringed with delicate bristles.

The eye is well developed, exhibiting some few very conspicuous crystalline bodies.

The ocellus is comparatively large, almost attaining the size of the eye, and occurs somewhat nearer to it than to the tip of the rostrum.

The antennulæ are rather narrow and sub-fusiform, and do not quite extend to the tip of the rostrum. They are provided at the tip with a bundle of somewhat unequal olfactory papillæ, and have, moreover, each a delicate sensory bristle projecting from the anterior edge about in the middle.

The antennæ are well developed, and exhibit the normal structure.

The lamellar expansion of the labrum is of moderate size, and exhibits the usual securiform shape, its edge being quite smooth.

The tail (fig. 2) is rather large, lamellar, and almost of equal breadth throughout, or but very slightly expanded distally, being obtusely truncated at the end, with the posterior corner rounded off. The post-anal angle is rather indistinct, nearly obsolete, and the posterior edge below it, very slightly convex, exhibiting a double row of well-defined denticles, about 15 in each row. Somewhat within the edge, moreover, occurs on each side a lateral row of very delicate, somewhat squamiform denticles, corresponding in number with the marginal ones. The terminal claws are rather strong, and each armed at the base with a comparatively large secondary denticle.

Occurrence.—The above-described specimen, the only one I have seen, was found in a sample taken by Mr. Whitelegge from the Centennial Park, near Sydney.

16. Alona pulchella, King.

(Pl. 6, figs. 3, 4).

Alona pulchella, King, l. c. p. 260, Pl. VIII B.

Specific Characters.—Shell, seen laterally, oblong quadrangular, not widening at all behind, posterior extremity obtusely truncated, with the lower corner rounded off, dorsal margin evenly arcuate, ventral straight. Head sub-erect,

terminating in an acute rostrum. Surface of shell faintly striated longitudinally. Ocellus much smaller than the eye. Tail comparatively short and of uniform breadth, transversely truncated at the tip, with the posterior corner well defined, postanal angle distinct, though obtuse, posterior edge below it perfectly straight and armed with a double row of very delicate denticles, in front of which there is on each side a lateral series of still more delicate, squamiform spinules, terminal claws rather elongated, each with a distinct secondary denticle at the base. Length of adult female 0,58 mm.

Remarks.—This is, as I believe, the form originally recorded by Mr. King under the above name. It is closely allied to another Australian species described by the present author from the northern part of the country as *A. lævissima*. But in the latter form, as indicated by the specific name, the shell is perfectly smooth, whereas in the present species it exhibits the usual longitudinal striation.

Description of the female.

The length of adult, ovigerous specimens does not exceed 0,58 mm., and is accordingly rather inferior to that of the preceding species.

The form of the shell, when seen laterally (fig. 3), is oblong quadrangular, being scarcely wider behind than in front. The posterior extremity appears obtusely truncated, with both the upper and lower corners rounded off, the latter being the more prominent. The dorsal margin is quite regularly arcuate until the tip of the rostrum, and has its greatest curvature about in the middle, whereas the ventral one appears almost straight and horizontal. The head is less procumbent than in the preceding species,

and terminates in an acute rostrum, somewhat shorter than in that species.

The surface of the shell is sculptured with distinct, though not very sharply marked, longitudinal striæ, which are less closely set than in the preceding species, their number being from 14 to 15 on each side. The inferior edges of the valves are, as usual, densely ciliated.

The eye is well developed, with distinct, though small crystalline bodies.

The ocellus is much smaller than the eye, and placed a little nearer to it than to the tip of the rostrum.

The antennulæ exhibit the usual narrow subfusiform shape, and do not extend to the tip of the rostrum.

The antennæ are less powerful than in the preceding species.

The lamellar expansion of the labrum is rather large, and has the edge perfectly smooth.

The tail (fig. 4) closely resembles that in *A. lævissima*, being comparatively short, and of uniform breadth. It is transversely truncated at the tip, with the posterior corner well defined and somewhat produced. The post-anal angle is distinctly marked, though not very prominent, and the posterior edge below it appears perfectly straight, carrying a double row of very small, hair-like denticles, 10—12 in each row. As in the preceding species, there is on each side an additional lateral row of extremely delicate, somewhat squamiform spinules. The terminal claws are considerably elongated, and each exhibit at the base a well-marked secondary denticle.

Occurrence.—Some few specimens of this form, all of them females, were found in the sample at first received from Prof. Ramsay, and taken from the Waterloo Swamps.

Mr. King collected the species at Varroville, near Denham Court, and also at St. Leonards, near Sydney. In the samples taken by Mr. Whitelegge, this species did not occur.

17. Alona abreviata, G. O. Sars, n. sp.

(Pl. 6, figs. 5, 6).

Specific Characters.—♀ Shell comparatively short and stout, and, seen laterally, of irregular quadrangular form, broadest in front of the middle, posterior extremity transversely truncated, dorsal margin abruptly curved in front, ventral slightly convex anteriorly. Head somewhat flattened above, semi-erect, terminating in a rather prominent, acute rostrum. Surface of shell sculptured in its posterior part with obliquely longitudinal lines, which are somewhat flexuous, so as to form an indistinct reticulation, anterior part of valves transversely striated, inferior edges ciliated. Ocellus smaller than the eye. Lamellar expansion of the labrum with a distinct notch anteriorly. Tail short and stout, obtusely truncated at the end, with the posterior corner evenly rounded, and armed on each side with about 10 well-defined denticles, post-anal angle rather prominent, and occurring at about the middle, terminal claws of moderate size, and each armed with a small secondary denticle. Colour pale corneous. Length of adult female 0,37 mm.

Remarks.—This form, at the first sight, looks very like the New Zealand species, *A. macrocopa*, described by the present author in another paper, but differs, on a closer comparison, in the somewhat different sculpture of the shell, as also in the minor development of the antennæ. Both these species form, as it were, a transition to the genus *Alonella*, though being distinguished from the species of

that genus by the immobility of the head, as in the other species of *Alona*.

Description of the female.

Fully adult, ovigerous specimens do not exceed a length of 0,37 mm., and this form is accordingly of very small size.

The shell is unusually short and stout, exhibiting, in a lateral view of the animal (fig. 5), a somewhat irregular quadrangular form, with the greatest breadth somewhat in front of the middle. The posterior extremity appears transversely truncated, with the upper corner well marked, the lower rounded off. The dorsal margin is boldly arched, forming an abrupt curve at the junction with the head, whereas the ventral one appears straigther, though exhibiting a slight convexity in front of the middle. The head is semi-erect, and has the dorsal face somewhat flattened, its upper edge being almost straight and declining towards the rostrum; the latter is rather prominent and, when seen laterally, acuminate.

The surface of the shell is very distinctly sculptured, exhibiting in its posterior part a number of obliquely longitudinal lines, which appear somewhat flexuous, thus forming an indistinct reticulation. These lines, in the anterior part of the valves, are crossed by a set of curved, transverse striæ, running parallel to the anterior edges, and rather sharply marked. The inferior edges of the valves are, as usual, densely ciliated.

The eye is of moderate size, and in its usual situation.

The ocellus occurs somewhat nearer to it than to the tip of the rostrum, and is of very inferior size.

The antennulæ exhibit the usual structure, and do not extend to the tip of the rostrum.

The antennæ are of normal appearance, not being of any unusual size.

The lamellar expansion of the labrum is rather large, and exhibits in front a distinct notch not found in the other known species.

The tail (fig. 6) is short and thick, on the whole resembling in shape that in *A. macrocopa*, though having the tip less obliquely blunted, and the rounded posterior corner more prominent; around the latter, a double series of from 8 to 10 well-defined denticles occur. The post-anal angle, as in *A. macrocopa*, is rather prominent, and placed nearly in the middle of the posterior edge.

The colour in living specimens is yellowish, or pale corneous.

Observations.—This form developed rather plentifully in one of my aquaria, and during one period of the season, it occurred in such numbers, that I was almost sure to get some specimens, on taking up, by the aid of a dipping tube, a very small portion of the loose bottom deposit, and examining it in a watch-glass. In the latter part of the summer, however, it almost wholly disappeared, and no male specimens were for this reason secured. It moves through the water in the very same manner as most other species of the genus, the movement being quite even and somewhat tremulous, not, as is the case with the New Zealand species, by abrupt jerks.

Occurrence.—The mud from which this form was raised, was taken by Mr. Whitelegge from a pond at the corner of Bourke Street and Botany Bay. The species also occurred in a sample from the same locality, but in a very limited number.

Gen. Alonella, G. O. Sars.

18. Alonella diaphana (King).

Alona diaphana, King, l, c. p. 360, Pl. VIII C.

Alonella diaphana, G. O. Sars, Add. Notes Austr. Cladocera, p. 47, Pl. 5, figs. 5—7.

This form, described and figured in detail by the present author in the above-mentioned paper, developed in the same aquarium as *Alona abbreviata*, but did not occur in any considerable number. It was, moreover, found in a sample taken by Mr. Whitelegge from the Centennial Park, though rather scarce.

19. Alonella clathratula, G. O. Sars, n. sp.

(Pl. 6, figs. 7, 8).

Specific Characters.—♀ Shell, seen laterally, oblong oval, greatest breadth in front of the middle, posterior extremity narrowly truncated, with the lower corner well defined, simple; dorsal margin evenly arcuate, ventral somewhat flexuous and convex in front. Head procumbent, produced to a sharply-pointed rostrum. Surface of shell very distinctly sculptured, exhibiting posteriorly a rather regular reticulation, anterior part of valves striated transversally. Ocellus much smaller than the eye. Tail rather narrow, not widening distally, post-anal angle well-marked, tip narrowly truncated, ante-anal denticles very small, hair-like, terminal claws of moderate size, each with a well-marked secondary denticle at the base. Length of adult female 0,36 mm.

Remarks.—This form is somewhat nearly allied to the European species, *A. excisa*, Fisher, but differs in the more

elongated form of the shell, and in the infero-posteal corners being simple, not excised.

Description of the female.

The length of fully adult, ovigerous specimens does not exceed 0,36 mm., and this form is accordingly of rather small size.

The form of the shell, when seen laterally (fig. 7), is oblong oval, with the greatest breadth about in the middle, and the posterior extremity narrowly truncated. The dorsal margin is quite evenly arcuate, and forms with the posterior one a distinct, though somewhat obtuse angle.

The inferior edges of the valves are somewhat flexuous, being rather convex in front, but posteriorly assuming a straighter course. They are defined from the posterior edges by a distinctly projecting corner, which sometimes terminates in a sharp point. No notch, however, like that generally occurring in *A. excisa*, is ever found above this corner.

The head, as in most other species of the genus, is rather procumbent, terminating in a long, acuminate, somewhat posteriorly-curving rostrum.

The surface of the shell is very conspicuously sculptured, exhibiting in its posterior part a rather regular reticulation, the meshes being disposed in oblique rows, whereas anteriorly, each valve exhibits a number of sharply-marked, curved, transverse striæ. The inferior edges of the valves are densely fringed with delicate bristles.

The eye occupies its normal place, and is of moderate size.

The ocellus occurs much nearer to the eye than to the tip of the rostrum, and is of very inferior size.

The antennulæ are comparatively short and thick, scarcely extending beyond the middle of the rostrum.

The antennæ are rather small, and of the usual structure.

The tail (fig. 8) is comparatively narrow, and somewhat resembles in form that in *A. excisa*, not being at all expanded distally, and having the tip narrowly truncated. The post-anal angle is well defined, though not very prominent, and the ante-anal denticles are very small, almost hair-like, and present to the number of about 10 pairs. The terminal claws are not very strong, and have each a minute secondary denticle at the base.

Occurrence.—Some specimens of this small Lynceid were picked up from a sample taken by Mr. Whitelegge from the Marubra Swamp, near Sydney. The specimens were of a very dark grey hue.

Gen. Camptocercus, Baird.

20. Camptocercus australis, G. O. Sars, n. sp.

(Pl. 6, figs. 9, 10).

Specific Characters. — ♀ Shell highly compressed and, seen laterally, of oblong form, broadest in front, posterior extremity narrowly rounded, dorsal margin evenly convex, ventral bulging anteriorly, straight behind. Head rather large, crested, terminating in a deflexed, blunt rostrum. Surface of shell longitudinally striated; inferior edges ciliated in the middle and not exhibiting any trace of denticles at the infero-posteal corners. Eye small; ocellus still smaller, both occurring at a rather considerable distance from the anterior edge of the head. Tail very slender and elongated, conically tapering distally, post-anal angle well-

marked, ante-anal denticles about 20 pairs, terminal claws slender, each with 2 distant secondary denticles. Length of adult female 0,74 mm.

Remarks.—This form looks very like the well-known European species, *C. macrurus*, Müll., but is at once distinguished by the total abscence of the denticles found at the infero-posteal corners of the shell in that, as also in the other known species of the genus.

Description of the female.

The body, as in the other species, is highly compressed, and provided with a distinct crest, extending along the dorsal face of both the shell and the head. Seen laterally (fig. 9), the shell exhibits an oblong form, being broadest in front, and narrowed towards the posterior extremity, which appears obtusely rounded, without any angle below, and with the upper corner almost obsolete. The dorsal margin forms a rather even curve until the tip of the rostrum, whereas the ventral one appears somewhat flexuous, being rather protuberant in front, and assuming behind a more straight course. The head is rather large and somewhat procumbent, terminating in a blunt, deflexed rostrum. The fornical edge is but very slightly curved, and joins the shell on each side at a very acute angle.

The surface of the shell is sculptured with well-marked longitudinal striæ, about 18 on each side, and exhibits besides, in the most anterior part of the valves, a number of closely set, curved transverse lines. The inferior edges of the valves are fringed with delicate bristles, which successively diminish in length behind, and disappear altogether at some distance from the posterior extremity. Not even the slightest trace of any denticles is found behind the

bristles at the infero-posteal corners of the shell, which appear perfectly smooth, and evenly rounded off.

The eye is rather small, and located at a considerable distance from the anterior edge of the head. This is also the case with the ocellus, which is much smaller than the eye, and occurs somewhat nearer to it than to the tip of the rostrum.

The antennulæ are rather slender and elongated, though not extending beyond the tip of the rostrum, except by their apical papillæ, which latter are rather fully developed, and of somewhat unequal length.

The antennæ are comparatively short, and of the usual structure.

The lamellar expansion of the labrum is not very large, but of the usual securiform shape, with the edge perfectly smooth.

The tail (fig. 10) exhibits the structure characteristic of the genus, being very slender and exceedingly mobile. It is of a narrow conical form, tapering gradually towards the end, which does not exhibit any notch or projecting corner behind the base of the terminal claws. The post-anal angle is well defined, and not far removed from the base of the tail. The posterior edge beyond the anal orifice is armed with a double row of about 20 well-defined denticles, the outermost of which is placed at some distance from the tip. The terminal claws are rather strong, and nearly straight, each having a well-defined secondary denticle at the base, and another somewhat smaller one about in the middle of the posterior edge.

Occurrence.—A solitary, but well preserved female specimen of this form was found in a sample taken by Mr. Whitelegge from the Centennial Park, near Sydney.

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Ostracoda.

Fam. Cyprididæ.

Gen. Cypria, Zencker.

21. Cypria pusilla, G. O. Sars, n. sp.

(Pl. 7, fig. 1, a—b).

Specific Characters.—♀ Shell much compressed and, seen laterally, almost semicircular in form, anterior extremity, however, lower than the posterior, dorsal margin boldly arched, ventral nearly straight; seen dorsally narrow oblong, both extremities somewhat blunted. Valves rather unequal, the right one being much the larger, and considerably overlapping the left in the middle of the dorsal face, as also anteriorly. Surface of shell smooth, but dotted all over with brownish pigment; both extremities clothed with delicate hairs. Length of adult female 0,58 mm.

Remarks.—This form is nearly allied to the European species, *C. ophthalmica* (Jurine), but of much smaller size, and, moreover, distinguished by the very conspicuous inequality of the valves.

Description of the female.

The length of the shell in fully grown specimens does not exceed 0,58 mm., and this form is accordingly of very small size as compared with the European species.

The shell is highly compressed and, viewed from the side (fig. 1 a), of a somewhat semicircular outline, with the greatest height about in the middle. The anterior extremity is somewhat oblique, and much lower than the posterior, which is broadly rounded. The dorsal margin forms a bold, and rather even curve, joining the anterior and posterior edges, without any intervening angle. The ventral margin appears almost straight, though there is a slight approach to a median sinus. Seen from above (fig. 1 b), the shell appears narrowly oblong, with the lateral contours nearly parallel, and both extremities somewhat blunted, though the anterior is somewhat narrower than the posterior.

The valves are very unequal, the right one being much the larger, and projecting considerably beyond the left along the middle of the dorsal face. Anteriorly it overlaps the left valve by a thin hyaline border, and a similar, though much narrower border is also seen at the infero-posteal corner.

The surface of the shell is perfectly smooth, without any distinct sculpturing. It is, however, dotted all over with a reddish brown pigment, similar to that found in *C. ophthalmica*. At each extremity the shell is clothed with very delicate hairs, somewhat more densely crowded together anteriorly. The eye may be pretty well traced through the shell, and the muscular pits in the centre of each valve are also rather conspicuous.

Occurrence.—Of this small species, solitary specimens were picked up from a sample taken by Mr. Whitelegge from the Waterloo Swamps.

Gen. Cypris, Müll.

22. Cypris bennelong, King.

Cypris bennelong, King, Proc. Roy. Soc. Van Diemen's Land, 1855, p. 63, Pl. X. A.

Cypris bennelong, G O. Sars, Fresh-water Entomostraca of New Zealand, p. 24, Pl. IV, figs. 1, a—d.

Syn. Chlamydotheca australis, Brady.

Of this characteristic form, described and figured by the present author in the above-quoted paper, numerous specimens were found in 2 different samples taken by Mr. Whitelegge from waterholes at Bourke Street. It is rather singular, that not even a single specimen of this species developed in my aquaria, though empty shells were not uncommon in the mud, with which these were prepared.

Distribution.—New Zealand (G. O. Sars).

23. Cypris sydneia, King.

Cypris sydneia, King, l. c. p. 65, Pl. X. M.

Cypris sydneia, G. O. Sars, Fresh-w. Ent., N. Z., p. 27, Pl. IV, figs. 2, a—c.

Syn. Cypris ciliata, Thomson.

This form, which exhibits so close a relationship to the European species, *C. incongruens*, developed rather plentifully in some of my aquaria, and grew to a much larger size than the specimens raised by the present author from New Zealand mud. It was also found in great numbers in some samples taken by Mr. Whitelegge from waterholes at Bourke Street, and in addition to these, a single, young specimen occurred in the sample first received from Prof. Ramsay, and taken from the Waterloo Swamps.

Distribution.—New Zealand.

24. Cypris leana, G. O. Sars, n. sp.

(Pl. 7, figs. 2, a—d).

Specific Characters.—Shell large, seen laterally, oval reniform, greatest height in the middle, anterior extremity evenly rounded, posterior subtruncate and scarcely broader than the anterior, dorsal margin almost angularly bent in the middle, ventral but very slightly sinuate; seen dorsally oblong cuneiform, gradually tapering in front, anterior extremity acuminate, posterior obtuse. Valves nearly equal, left one having the edge minutely tuberculated in front and behind; inner duplicatures not very broad. Surface of shell remarkably smooth and polished, being clothed at both extremities with minute hairs. Caudal rami rather slender and slightly flexuose, narrowed distally, outer claw about half the length of the ramus. Length of shell 2,70 mm.

Remarks.—The present species is allied to *C. sydneia*, but is evidently distinct from it, being nearly twice as large and having the shell higher in proportion to its length. It is named in honour of its discoverer, Mr. Lea.

Description of the female.

The length of the shell measures 2,70 mm., and this form accordingly grows to a very large size.

Seen laterally (fig. 2 a) the shell exhibits a somewhat irregular, oval reniform shape, with the greatest height, which about equals 3/5 of the length, occurring in the middle. The anterior extremity is quite evenly rounded, whereas the posterior one appears somewhat obtusely truncated, and is scarcely broader. The dorsal margin is boldly arched, being almost angularly bent in the middle, and slopes at about the same angle both anteriorly and posteriorly. The ventral margin appears nearly straight, though a slight sinus may be traced in the middle.

Seen from above (fig. 2 b), the shell exhibits an oblong cuneiform shape, with the greatest width, which about equals half the length, occurring far behind the middle. Anteriorly

it is gradually narrowed to a somewhat twisted acute point, whereas the posterior extremity is more obtusely rounded.

The valves, at first sight, appear nearly equal. On a closer examination, however, the left one is found to be somewhat larger than the right, overlapping it anteriorly by a narrow, hyaline border; and below the posterior extremity a similar projecting rim may also be traced. As in *C. sydneia*, the right valve exhibits at the anterior edge and at the posterior part of the ventral one, a series of small knobs or tubercles, giving the edge a minutely crenulated appearance. The inner duplicatures are rather narrow, though the anterior one is somewhat broader than the posterior.

The surface of the shell is remarkably smooth and polished, without any perceptible sculpturing, except the usual small dots; and it is only at each extremity that it is clothed with very small hairs. The muscular pits in the centre of each valve are fairly conspicuous, and resemble those in *C. sydneia*.

The colour of the shell could not be ascertained, as the specimens were discoloured by long immersion in spirit.

The caudal rami (fig. 2 c) are of moderate size and rather slender, tapering somewhat distally, and exhibiting a slight flexure. They are armed in the usual manner, each having at the end 2 unequal claws and 2 bristles. The claws are rather slender, the outer one being half the length of the ramus.

Occurrence.—A rather considerable number of this pretty species were contained in a sample taken by Mr. Lea from a pond «Near Hay».

25. Cypris lateraria, King.

(Pl. 7, figs. 3, a—c).

Cypris lateraria, King, l. c., p. 65, Pl. X G.

Specific Characters.—Shell ventricose, seen laterally, clavate in form, much higher in front than behind, anterior extremity broadly rounded, posterior subtruncate, dorsal margin subangular above the eye, and gradually sloping behind, ventral deeply sinuated: — seen dorsally, regularly ovate, with the greatest width fully equalling the height, and occurring behind the middle, anterior extremity more pointed than the posterior. Valves very unequal, the left one being much the larger, and overlapping the right both anteriorly and posteriorly. Surface of shell of a dull appearance, being distinctly granular all over, and also armed with scattered tubercles, more conspicuous towards both extremities, which are densely hairy. Caudal rami moderately strong, nearly straight, outer claw not attaining half the length of the ramus. Colour of shell uniformly yellowish green. Length 1,05 mm.

Remarks.—This is a very distinct species, and undoubtedly that recorded by Mr. King under the above name. In outward appearance it somewhat resembles the species of the genus *Ilyocypris*, and, indeed, I at first believed it to belong to that genus. A closer examination of the several appendages has, however, shown it to be a true *Cypris*.

Description of the female.

The length of the shell, in fully grown specimens, but little exceeds 1 mm., and this form is accordingly of rather small size.

Seen laterally (fig. 3 a), the shell exhibits a pronounced clavate form, being much higher in front than behind, with the greatest height equalling about half the length. The anterior extremity is broadly rounded, whereas the posterior one appears somewhat obliquely truncated, with the lower corner more prominent than the upper. The dorsal margin has its greatest curvature just above the eye, where it exhibits an almost angular bend, and from thence slopes evenly, and at a nearly straight course, to the hind extremity. The ventral margin is deeply sinuated somewhat behind the middle, and joins the posterior edge by an abrupt curve.

Seen from above (fig. 3 b), the shell appears very tumid, the greatest breadth, which occurs considerably behind the middle, fully equalling the height. It exhibits a rather regular ovate form, with the side-contours evenly curved, and the anterior extremity somewhat more pointed than the posterior.

The valves are very unequal, the left one being much larger than the right, and overlapping it considerably along the whole anterior extremity, as also posteriorly. The inner duplicatures are not particularly broad.

The surface of the shell is of a dull appearance, and often covered with muddy particles. It appears closely granular all over, exhibiting, as it were, a squamous sculpture. Moreover, a number of well-defined obtuse tubercles may be traced on each valve, being more conspicuous towards each extremity. Both anteriorly and posteriorly the shell is densely hairy.

The colour of the shell, in living specimens, is a rather uniform yellowish green.

The several appendages agree on the whole in their structure rather closely with those in the typical species of

Cypris, both pairs of antennæ being provided with very long natatory setæ, and the masticatory lobes of the 1st pair of maxillæ exhibiting the usual narrow, digitiform shape.

The caudal rami (fig. 3 c) are moderately strong, nearly straight, and but slightly narrowed distally. Their armature is the usual one, the outer claw being the longer, though not attaining half the length of the ramus.

Observations.—Some few specimens of this form developed in one of my aquaria, and were watched for some time. They did not, however, multiply to any great extent, and after the lapse of some months, no specimens were to be found in the aquarium. The animal is rather active, moving about through the water with great speed, at times affixing itself to the walls of the aquarium.

Occurrence.—The mud from which this species developed, was taken by Mr. Whitelegge from ponds and ditches at Bourke Street. Several well-preserved specimens also occurred in a sample taken by that gentleman from the same locality. Mr. King collected the species from a pond in a brickfield, near Sydney.

Gen. **Candonocypris**, G. O. Sars.

22. Candonocypris candonoides, King.

Cypris candonoides, King, l. c., p. 66, Pl. X F.

Herpetocypris stanleyana, G. O. Sars, On some Ostracoda and Copepoda raised from dried Australian mud, p. 35, Pl. II, figs. 1—2, Pl. V, figs. 5—7.

This form, whose identity with *Cypris candonoides* of King, I have stated in my paper on the New Zealand Entomostraca, developed rather abundantly in several of my aquaria, and was also found in great numbers in some

of the samples sent by Mr. Whitelegge, and taken from ponds and ditches at Bourke Street.

Distribution. — Queensland, New Zealand, Knysna (G. O. Sars).

Gen. Ilyodromus, G. O. Sars.

27. Ilyodromus varrovillius, King.

Cypris varrovillius, King, l. c., p. 66, Pl. X. D.

Ilyodromus varrovillius, G. O. Sars, Fresh-water Entomostraca of New Zealand, p. 41, Pl. VI, figs. 1, a—c.

In some of my aquaria this beautiful form developed rather plentifully, and continued to live and multiply during the whole season. It also occurred, though rather rarely, in the samples sent by Mr. Whitelegge, the locality being the same as that from which the preceding form was derived.

Distribution.—New Zealand (G. O. Sars).

28. Ilyodromus viridulus, Brady.

Cypris viridula, Brady, Proc. Zool. Soc. London, 1886, p. 88, Pl. VIII, figs. 1, 2.

Herpetocypris viridula, G. O. Sars, On some Fresh-water Ostracoda and Copepoda raised from Australian mud, p. 41, Pl. II, figs. 3, 4; Pl. V, figs. 8—11.

As observed in my paper on the New Zealand Entomostraca, this form ought to be referred to the genus *Ilyodromus*, as characterised by the author in that paper. It developed in the same aquarium as the preceding species, and was likewise found occasionally in the samples sent by Mr. Whitelegge.

Distribution.—Queensland (G. O. Sars).

29. Ilyodromus substriatus, G. O. Sars.

Ilyodromus substriatus, G. O. Sars, Fresh-water Entom. N. Zeal., p. 45, Pl. VI, figs. 3, a—c.

Some few specimens of this form were found in the samples sent from Mr. Whitelegge. It did not, however, develop in my aquaria.

Distribution.—New Zealand (G. O. Sars).

30. Ilyodromus ellipticus, G. O. Sars, n. sp.

(Pl. 7, figs. 4, a—c).

Specific Characters.—Shell much compressed, seen laterally, regularly oblong or elliptical in form, both extremities nearly equal and evenly rounded, dorsal margin but very slightly convex, ventral almost straight: — seen from above, narrow oblong, anterior extremity somewhat narrower than the posterior. Valves nearly equal and having the inner duplicatures very broad. Surface of shell very faintly striated longitudinally, and clothed at each extremity with scattered hairs, those of the posterior one being particularly long. Colour of shell transparent yellowish, each extremity, but especially the anterior one, being tinged with deep green. Caudal rami rather strong, and of the structure characteristic of the genus. Length 1,18 mm.

Remarks.—The present new species is somewhat allied to *I. substriatus*, exhibiting a similar faint longitudinal striation, but it may be at once distinguished by the rather different shape of the shell, which is more regularly oblong or elliptical than in any of the other known species.

Description of the female.

The length of the shell in fully grown specimens does not exceed 1,18 mm., and this form is accordingly somewhat inferior in size to *I. substriatus*.

Seen laterally (fig. 4 a), the shell exhibits a very regular oblong, or rather elliptical form, with the greatest height attaining not nearly half the length. Both extremities appear evenly rounded and nearly equal. The dorsal margin is but very slightly convex, without forming any trace of angle at the junction with the anterior and posterior edges. The ventral margin appears almost perfectly straight, the usual median sinus being quite obsolete.

Seen from above (fig. 4 b), the shell appears very much compressed, the greatest width scarcely exceeding 1/3 of the length. Its form is very narrow oblong, with the side-contours but slightly convex, and the anterior extremity somewhat more pointed than the posterior.

The valves, at first sight, appear nearly equal. On a closer examination, however, the left valve, as in the other species, is found to be in reality a little larger than the right, overlapping it anteriorly by a very narrow hyaline rim. The inner duplicatures, especially the anterior ones, are very broad and shelf-like, and their defining edge may be pretty well traced through the shell.

The surface of the shell is indistinctly striated longitudinally, the striæ being very delicate, and in some cases only with great difficulty traceable. At both extremities it is clothed with delicate hairs, which on the posterior extremity are particularly long and far apart.

The colour of the shell in living specimens is transparent yellowish, allowing the cæcal appendages of the intestine and the opaque whitish ovarial tubes to be seen through rather distinctly. At each extremity it is tinged with deep green, this colour being especially very conspicuous anteriorly, where it occupies a rather broad, semilunar area inside the edge.

The eye is very large and conspicuous, exhibiting in the living animal a brillant iridescent lustre.

The several appendages closely agree in their structure with those in the other species of the genus.

This is also the case with the caudal rami (fig. 4 c), which are very strong, of a light corneous hue, and of about uniform breadth throughout. They are, as usual, armed at the end with 3 strong claws, successively increasing in size distally, the outermost one being, however, scarcely half the length of the ramus; just in front of it, the usual small bristle occurs.

Observations.—This form developed in some of my aquaria, but only in one of them did it multiply to any great extent. In habits, it agrees with the other species, moving with great dexterity through the loose bottom deposit, but being wholly devoid of swimming power.

Occurrence.—The mud from which this species developed, was taken by Mr. Whitelegge from waterholes at Bourke Street, and from a sample taken in the same place some few specimens of this form were also picked up.

Gen. **Cypridopsis**, Brady.

31. Cypridopsis minna, King.

(Pl. 7, figs. 5, a—c).

Cypris minna, King, l. c., p. 64, Pl. X B.

Cypridopsis minna, Brady, Proc. R. S. London, 1866, p. 91, Pl. X, figs. 1—3.

Specific Characters.—Shell moderately tumid; seen laterally, exceedingly high, of a rounded trigonal form, with the dorsal margin boldly arched and abruptly bent in the middle, ventral slightly sinuated, both extremities rounded

and nearly equal; — seen from above broadly ovate, greatest width not exceeding the height, anterior extremity obtusely pointed, posterior evenly rounded. Valves rather unequal, the right one overlapping the left considerably in the middle of the dorsal face, as also anteriorly. Surface of shell smooth, or very slightly granular, moderately hairy, with a narrow, transversely-striated, marginal area just within the anterior edge of each valves. Colour yellowish, variegated with dark green, partly anastomosing patches. Length of shell 0,92 mm.

Remarks.—This is undoubtedly the true *C. minna* of King, and the form described by Brady also belongs quite certainly to the very same species. On the other hand, the form described by the present author under this name from New Zealand is specifically distinct, as will be shown farther on. The present species may be easily recognized from any of the other known forms by the extraordinary height of the shell, which gives it, in a lateral view, nearly a trigonal shape.

Description of the female.

The length of the shell in fully adult specimens measures 0,92 mm., and accordingly somewhat exceeds that of the said New Zealand form

Seen from the side (fig. 5 a), the shell exhibits a somewhat unusual form, being exceedingly high and almost trigonal in outline, with the greatest height not very inferior to the length, and occurring in the middle. Both extremities appear somewhat obliquely rounded, and nearly equal. The dorsal margin is very boldly arched, exhibiting an almost angular bend in the middle, and from thence sloping rather steeply both anteriorly and posteriorly. The ventral margin is but very slightly sinuated in the middle.

Seen from above (fig. 5 b), the shell appears less tumid than in the New Zealand form, and exhibits a rather regular rounded ovate form, the greatest width not exceeding the height. The anterior extremity is obtusely pointed, whereas the posterior one appears quite evenly rounded.

The valves are rather unequal, the right one being the larger, and overlapping the left not only along the anterior extremity, but also in the middle of the dorsal face. Somewhat below the centre of each valve, the muscular pits are observed, and just within the anterior edge, as in some other species, there is a narrow, very dark-coloured, marginal area, which exhibits a number of very conspicuous, light, transverse striæ.

The surface of the shell is smooth, or very slightly granular, being clothed all over with delicate hairs, which at each extremity are more densely crowded together.

The ground-colour of the shell in living specimens is yellowish and semi-transparent; but along the edges of the valves, as also in their centre, several dark-green patches occur, which are partly confluent, so as to form irregularly ramified bands.

The several appendages do not seem to differ in any manner from those in other species of the genus; the caudal rami too (fig. 5 c), exhibit the characteristic, very narrow linear form, with the claws extremely slender and almost setiform.

Observations.—This form developed rather plentifully in some of my aquaria, and continued to live and propagate during the whole summer. In habits, it exactly agrees with the other species of the genus.

Occurrence.—The mud from which this species developed, was the same parcel, that yielded most of the other

Cyprididæ here treated off, having been taken by Mr. Whitelegge from waterholes at Bourke Street. A sample taken from the same place, also contained numerous well preserved specimens.

32. Cypridopsis turgida, G. O. Sars, n. sp.

Cypridopsis minna, G. O. Sars, Fresh-water Entom. of N. Zeal. p. 20, Pl. IV, figs. 3, a—d.

As above stated, this form is evidently specifically distinct from the preceding one, with which I have wrongly identified it at an earlier date. It must therefore have another name, and I propose to call it *C. turgida*, on account of its extremely tumid shell.

This species too, developed in great numbers in my aquaria, and could at once be distinguished from the preceding one by its more tumid shell, and more uniform colouring. It was also found in the sample sent by Mr. Whitelegge.

Distribution.—New Zealand, Knysna, China (G. O. Sars).

Gen. **Candonopsis**, Vavra.

33. Candonopsis tenuis, Brady.
(Pl. 7, figs. 6, a—d).

Candona tenuis, Brady, Proc. R. S. London, 1886, p. 92, Pl. X, figs. 9, 10.

Specific Characters.—Shell much compressed, and of slightly different shape in the 2 sexes, being, however, in both, when seen laterally, more or less oblong reniform, with the hind extremity rounded and broader than the anterior: ventral margin distinctly sinuated, the sinus in female being median, in male, occurring somewhat in front of the middle,

dorsal margin in female almost straight, with an indication of angle both anteriorly and posteriorly, in male evenly arched throughout: — seen from above, narrow oblong, more pointed in front than behind. Valves equal, smooth, semi-pellucid, of whitish colour, hairy at both extremities. Caudal rami very narrow, almost straight, and terminating with 2 somewhat unequal claws, each having beyond the middle a distinct secondary denticle, dorsal bristle wanting. Length of female 0.90 mm., of male 1.00 mm.

Remarks.—This, I believe, is the form briefly described and figured by Prof. Brady as *Candona tenuis*. It certainly belongs to the genus *Candonopsis*, as recently characterised by Mr. Vávra in his Monograph of the Ostracoda of Bohemia, and is nearly allied to the typical form *C. Kingsleyi*, though differing somewhat in the form of the shell, and apparently also in the structure of the caudal rami.

Description.—The length of the shell in adult female specimens scarcely exceeds 0.90 mm.; that of male specimens is somewhat greater, measuring 1.00 mm.

The shell in both sexes is highly compressed and, seen laterally (fig. 6 a, 6 b), of an oblong reniform shape, the greatest height scarcely exceeding half the length, and occurring behind the middle. Both extremities are rounded, and the anterior one is considerably narrower than the posterior, which appears somewhat compressed in its inferior part. The dorsal margin in the female (fig. 6 a) is nearly straight in the middle, with an indication of an angle both in front and behind, whereas in the male (fig. 6 b) this margin appears quite evenly arcuate. The ventral margin is in both sexes distinctly sinuated, but the sinus occurs in the male (fig. 6 b) somewhat in front of the middle, whereas in the female

Trykt den 16de Juli 1896.

(fig. 6 a) it is almost median. On the whole, the posterior part of the shell in the male (fig. 6 b) appears broader and more expanded than in the female (fig. 6 a), and the anterior extremity more produced. Seen from above (fig. 6 c), the shell in both sexes appears very narrow oblong, with the anterior extremity somewhat more pointed than the posterior.

The valves are nearly equal, and rather thin, are semipellucid, and clothed at each extremity with delicate hairs. The inner duplicatures are rather broad, especially the anterior ones, and their defining edges may be fairly well traced through the shell.

The surface of the shell appears quite smooth and polished, though exhibiting, when examined under a strong magnifier, an extremely delicate reticulation.

The colour of the shell in living specimens is transparent whitish, permitting several of the inner organs to be fairly well traced through it.

The eye is very small, and, it would seem, devoid of the usual dark pigment, being on that account rather difficult to trace.

The structure of the several appendages seems exactly to agree with that described by Mr. Vávra in the typical species, *C. Kingsleyi*.

The caudal rami (fig. 6 d), as in that species, are rather narrow, sublinear, and lack all trace of the usual dorsal bristle. They are, however, in the present species straighter, and each of the terminal claws has beyond the middle a very conspicuous secondary denticle, not found in the typical species.

In the male (fig. 6 b—c) the very large «mucous glands», or more correctly the «zenckerian organs» are

distinctly traced through the shell, both in its lateral and dorsal views, appearing as 2 large, juxtaposed bags extending through the posterior half of the shell, and exhibiting within from 5 to 6 verticils of bristle-like radiating processes. Also the spermatic tubes contained within the 2 lamellæ of the valves may be fairly well discerned.

Observations.—An adult male specimen of this form, the one here figured, was by a mere chance found in one of my aquaria, on taking up, by the aid of a dipping tube, a small quantity of the bottom deposit. It was at once subjected to a closer examination under the microscope, and its habits studied. Though subsequently very closely examining the bottom contents of this aquarium, I did not succeed in detecting any more specimens. In habits, this form agrees with the typical species, as also with the species of the genus *Ilyodromus*, as it moves rather quickly through the loose bottom deposit, but is wholly devoid of swimming power.

Occurrence.—The mud, from which this form developed, was taken by Mr. Whitelegge from waterholes at Bourke Street. Numerous specimens of the same form, both males and females, moreover, occurred in a sample taken by that gentleman from the Marubra Swamp. The specimens examined by Prof. Brady were derived from Condong, Tweed River, New South Wales.

Copepoda.

Trib. Calanoidea. Fam. Diaptomidæ.

Gen. Boeckella, Guerne & Richard.

34. Boeckella triarticulata (Thomson).

Boeckia triarticulata, Thomson, Proc. N. Z. Inst. Vol. XV, 95, Pl. VI, figs. 1—9.

Boeckella triarticulata, G. O. Sars, Fresh-water Entom. N. Zeal., p. 49, Pl. VII & VIII.

Of this species, described and figured in detail by the author in the above-quoted paper, some few specimens, exactly agreeing in every detail with the New Zealand form, were found in a sample taken by Mr. Whitelegge from some pond near Sydney.

Distribution.—New Zealand (Thomson).

35. Boeckella robusta, G. O. Sars, n. sp.
(Pl. 8, figs. 1—4).

Specific Characters.—Anterior division of body in female rather thick and swollen, oblong oval in form, broadest in front of the middle, and slightly narrowed posteriorly, 1st segment about the length of the 4 succeeding ones combined, front narrowly rounded; lateral expansions of last segment scarcely divergent, extending beyond the 1st caudal segment, outer lobe large, broadly lanceolate, inner lobe very small, acute triangular. Tail, including the caudal lamellæ, not nearly half the length of the anterior division, 1st segment moderately tumid and slightly asymetrical. Caudal lamellæ nearly as long as the last 2 segments combined. Anterior antennæ scarcely exceeding in length the anterior division of the body; right prehensile antenna in male about as in *B. triarticulata*. Last pair of legs in female, with the terminal joint of the outer ramus shorter than the preceding joint, and armed with 7 spines, the outer apical one being rather strong; those in male, of the structure characteristic of the genus, inner ramus of right leg conically tapered, with a small curved seta inside the base, left leg without any serrated lamella at the base of the inner, extremely small ramus. Length of female 3.20 mm.

Remarks.—In the comparatively robust form of the body, this new species somewhat resembles the South American form *B. brasiliensis*, Lubbock, as recently described by Messr. Poppe and Mrázek. It is, however, of much larger size and, moreover, differs rather markedly in some of the anatomical details. From *B. triarticulata* it is also very easily distinguishable.

Description of the female.

The length of the body, measured from the front to the tip of the caudal lamellæ, is 3.20 mm., and this species accordingly grows to a very considerable size.

The form of the body, as compared with that of *B. triarticulata*, is very robust, the anterior division being considerably tumefied, and more than twice as long as the posterior one. Seen from above (fig. 1), the former division exhibits an oblong subfusiform shape, the greatest breadth occurring somewhat in front of the middle, and almost equalling half the length. Anteriorly it terminates in a nar-

rowly rounded frontal part, whereas posteriorly it is but slightly attenuated. As in other species, this division exhibits 6 well-defined segments, the 1st of which is much the largest, equalling in length the 4 succeeding segments combined. At the sides of this segment, the 2 pairs of antennæ and to some extent also some of the oral parts are seen to project. The last segment is deeply emarginated in the middle, and is produced on each side of the emargination to a lamellar expansion pointing backwards and extending somewhat beyond the 1st caudal segment. As in *B. triarticulata*, these expansions are each divided into 2 lobes, the outer of which is much the larger and of broadly lanceolate form, terminating in a sharp point, bent slightly outwards. The inner lobe is extremely small, appearing merely as a slight acute lappet issuing from the inner side of the outer lobe. In *B. triarticulata* these inner lobes are much more fully developed, and the outer lobes rather narrow, mucroniform, and considerably divergent.

The tail is comparatively short, not nearly attaining half the length of the anterior division, and, as usual, is much narrower. It is divided into 3 well-defined segments, the 1st of which, the genital segment, is much the largest, and somewhat irregularly dilated in the middle, exhibiting below a rounded prominence, to which the egg-bag, when present, is attached. The last segment, which about equals in size the penultimate one, is somewhat dilated distally, and exhibits at its end the anal opening, partly covered above by a semilunar ridge. To this segment the caudal lamellæ are attached. They are comparatively larger than in *B. triarticulata*, attaining about the length of the last 2 segments combined, but otherwise they exhibit much the same appearance, having each 5 strong and densely plumose

marginal setæ, and also at the inner corner above, a simple bristle.

The eye is rather small, though distinct, being placed, as usual, at some distance from the front and nearer the ventral than the dorsal face.

The anterior antennæ (see fig. 1) are comparatively shorter than in the New Zealand species, scarcely exceeding in length the anterior division of the body, and they are divided into the usual number (25) of articulations.

The posterior antennæ, the oral parts and the 4 anterior pairs of legs in their structure agree, on the whole, perfectly with those parts in *B. triarticulata*, and need not therefore be described in detail.

The last pair of legs (fig. 2) are also constructed in a very similar manner, being, like the preceding pairs, natatory, though differing from them in some points. The outer ramus is rather robust and, as in the other known species, has the 2nd joint produced inside to a strong conical process, coarsely denticulated on both edges. The terminal joint of this ramus is comparatively smaller than in *B. triarticulata*, being scarcely as long as the preceding joint, and very much narrower. It is, however, armed with the same number of spines, viz., 7, 2 of which issue from the outer edge, 3 from the inner, and 2 from the tip; of the last the outer one is much the larger and considerably stronger than any of the others. The inner ramus is but little more than half as long as the outer, and much narrower. Of its 3 joints, the terminal one is comparatively much smaller than in *B. triarticulata*, and carries only 5 setæ, whereas 6 such setæ are found in the said species. On the other hand, the 2nd joint has an additional seta inside, not found in *B. triarticulata*.

The adult male is somewhat smaller than the female, and exhibits the same difference from it as that observed in *B. triarticulata*, being on the whole of much more slender form and having the last segment of the anterior division quite simple, without any lateral expansions. Moreover, the tail appears more elongated, and is divided into 5 well-defined segments, besides the caudal lamellæ.

The right prehensile anterior antenna (fig. 3) is constructed in a similar manner to that in the male of *B. triarticulata*, the movable terminal part being without any processes or spines and somewhat shorter than the adjoining tumefied part of the antennæ.

The last pair of legs (fig. 4), as in the other species of the genus, are transformed into strong grasping organs, both legs being nearly equally developed, and each terminating with a slender claw. In the right leg, the outer ramus is distinctly biarticulate and comparatively more strongly developed than in the left leg, where it is composed of a single joint only. In the right leg, moreover, the claw is more abruptly curved than in the left, the claw of which, on the other hand, is more elongated and exhibits outside, near the base, a small secondary spine. The inner ramus of the right leg is simple and conically tapering in its outer part, and carries at the base inside a small, curved bristle; that of the left leg is extremely small, knob-like, and attached to the inside of a projecting corner of the last joint of the basal part. Of the serrated lamella occurring in *B. triarticulata* inside this joint, no trace is found in the present species.

Occurrence.—Some specimens of this pretty species were found in a sample taken by Mr. Whitelegge from some pools near Sydney. It is most probable, that the species has also been observed by Mr. King, and regarded by him as a species of the genus *Diaptomus*. But, as no figures or descriptions are given of the 4 species he enumerates, it is impossible to decide to which of them it ought to be referred.

36. Boeckella minuta, G. O. Sars, n. sp.

(Pl. 8. figs. 5—7).

Specific Characters.—Body much more slender than in the preceding species, the anterior division exhibiting in female a narrow oblong or almost cylindrical form, with the front obtusely rounded; lateral expansions of last segment less fully developed, not nearly extending to the end of the 1st caudal segment, outer lobe short lanceolate, inner triangular. Tail nearly as in the preceding species, but with the caudal lamellæ somewhat smaller. Anterior antennæ rather elongated, equalling in length the whole body, excepting the caudal lamellæ. Last pair of legs in female, with the terminal joint of the outer ramus extremely minute, and only provided with 2 unequal apical spines; those in male of a similar structure to that in the preceding species, but with the inner ramus in both legs simple cylindrical. Body in both sexes highly pellucid and nearly colourless. Length of adult female 1.28 mm.

Remarks.—This additional new species is easily distinguishable both from *B. triarticulata* and *robusta*, being of very inferior size, and also differing in the much more slender body, the less fully developed lateral expansions of the last pedigerous segment in the female, and in the somewhat deviating structure of the last pair of legs in both sexes.

Description of the female.

The length of fully adult, ovigerous specimens does not exceed 1.28 mm., and this form accordingly is very inferior in size to any of the other known species.

The body is, on the whole, much more slender than in the preceding species, and in this respect also surpasses the New Zealand form. The anterior division exhibits, when seen dorsally (fig. 5), a very narrow oblong, almost cylindrical form, the greatest width scarcely exceeding 1/3 of the length. Anteriorly it somewhat tapers towards the obtusely rounded front, whereas posteriorly it is scarcely at all narrowed. The lateral expansions of the last segment are not nearly so fully developed as in the 3 other species, and extend but little beyond the middle of the 1st caudal segment. They are each divided into 2 well-defined lobes, the outer of which is the larger, and of a short lanceolate form, whereas the inner is more triangular in shape.

The tail does not attain half the length of the anterior division, and has the caudal rami somewhat smaller than in *B. robusta*, not nearly attaining the length of the 2 preceding segments combined.

The eye is very conspicuous, the pigment being of a dark red colour.

The anterior antennæ (see fig. 5) are rather elongated, equalling in length the whole body, minus the caudal rami. They are composed of the usual number of articulations, and in the living animal are generally extended laterally, with a slight curvature at the base.

The last pair of legs (fig. 6) differ conspicuously from those in the other species in the poor development of the terminal joint of the outer ramus. This joint is extremely small and of a linear form, carrying only 2 apical spines, the inner of which is the longer. Otherwise these legs, as also the other appendages, exhibit the structure characteristic of the genus.

The adult male, as usual, is even somewhat smaller than the female, and differs from it in the usual sexual characters.

The last pair of legs (fig. 7) are on the whole constructed as in the other species, though, on a closer comparison, several minor differences may be found to exist. Thus, the last joint of the outer ramus of the right leg is comparatively narrower than in the preceding species, and on the left leg this ramus is somewhat attenuated distally, whereas in *B. robusta* it is on the contrary, dilated at the end. The inner ramus in both legs is simple cylindric, being somewhat larger in the right than in the left leg. In the latter, the last joint of the basal part projects inside to a sharp corner, but any serrated lamella, like that found in *B. triarticulata*, does not exist.

In the living state of the animal, the body is highly pellucid and almost colourless, admitting of some of the inner organs being pretty easily traced through the thin integuments. The ovisac in the female (see fig. 5) only contains a very restricted number of eggs of a pale greenish colour.

Observations.—Some few specimens of this form developed in one of my aquaria and were watched for about a month. They did not, however, multiply, though some of the females were ovigerous, and in the later part of the summer they wholly disappeared. In habits it agrees with *B. triarticulata*, moving about in quite a similar manner.

Occurrence.—The mud, from which this form developed, was taken by Mr. Whitelegge from a pond off Botany

Bay, near Waterworks Bridge. A rather considerable number of specimens of the same species were, moreover, picked up from a sample taken by that gentleman from ponds at Bourke Street and the Waterloo Swamps.

Trib. Cyclopoidea. Fam. Cyclopidæ.

Gen. Cyclops, Müll.

37. Cyclops australis, King.

Specific Characters.— ♀ Body moderately slender, with the anterior division oblong oval, tapering somewhat posteriorly; none of the segments extant laterally. Tail about 2/3 as long as the anterior division, genital segment not attaining the length of the 3 succeeding segments combined, and moderately dilated in front. Caudal rami narrow, linear, not diverging, exceeding in length the last 2 segments combined, innermost apical setæ a little longer than the outmost, both being much shorter than the 2 median ones, bristle of the outer edge not far remote from the tip. Anterior antennæ scarcely exceeding in length the 1st segment of the body, and 12-articulate, 8th and 9th joints rather large. First pair of legs with both rami biarticulate, the 3 succeeding pairs with 3-articulate rami of normal structure; 4th pair with the outer apical spine of the inner ramus nearly as long as the inner. 5th pair of legs very rudimentary, the basal joint not being defined from the segment, though carrying the usual seta, terminal joint very minute, with a comparatively short apical seta and an extremely small lateral denticle. Length of adult female 2.20 mm.

Remarks.—Although Mr. King would seem to have comprised several species under the above name, I think I am right in restricting the specific denomination proposed by that author to the present species, all the other forms, with which I am acquainted, having turned out to be identical with well-known European species. The present species is a very distinct one, differing, so far I can judge, from all the other known forms. For want of room on the plates, I have not been enabled to give any figure of this form, but I hope, that the above diagnosis will suffice for easily recognizing the species.

Occurrence.—This form was found in 4 different samples, the localities of which are as follows: Waterloo Swamps, Centennial Park, waterholes at Bourke Street, and «Near Sydney». It was not hatched in my aquaria.

38. Cyclops albidus (Jurine).

Syn. C. tenuicornis, Claus.

A few specimens of this well-known European species were found in a sample from the Centennial Park.

39. Cyclops Leuckartii, Claus.

Numerous specimens of this form were picked up from 3 different samples, the localities of which are as follows: Centennial Park; Bourke Street; Waterloo Swamps; waterholes at Bourke Street.

40. Cyclops serrulatus, Fischer.

Found rather abundantly in 2 samples, the one from the Centennial Park, the other from the Waterloo Swamps. It also developed in great numbers in my aquaria.

41. Cyclops phaleratus, Koch.

Some specimens of this species occurred in a sample from the Centennial Park.

42. Cyclops affinis, G. O. Sars.

Very frequent in several samples: Waterloo Swamps; Centennial Park; Bourke Street; Waterloo Swamps; water-holes at Bourke Street; opposite the Rope Works; Near Sydney. It was also found in great abundance in my aquaria.

Explanation of the plates.

Pl. I.

Daphnia carinata, King.

Fig. 1. Typical form: ovigerous female, seen from left side; magnified 26 diameters.
» 2. Tail of same, more highly magnified.
» 3. *Var. intermedia*: female with ephippium, seen from left side; magnified 26 diameters.
» 4. *Var. magniceps:* ovigerous female, seen from left side; magnified 26 diameters.

Pl. II.

Simocephalus acutirostratus, King.

Fig. 1. Ovigerous female, seen from left side; magnified 24 diameters.
» 2. Anterior part of the body, more highly magnified (antennæ omitted).
» 3. Tail.

Simocephalus gibbosus, G. O. Sars.

Fig. 4. Ovigerous female, seen from left side; magnified 44 diameters.
» 5. Anterior part of body, more highly magnified (antennæ omitted).
» 6. Tail.

Pl. III.

Moina australiensis, G. O. Sars.

Fig. 1. Adult female, with the matrix greatly distended with embryos, seen from left side; magnified 62 diameters.
» 2. One of the antennulæ, more highly magnified.
» 3. Leg of 1st pair.
» 4. Extremity of tail.
» 5. Ephippium from left side.
» 6. Adult male, seen from left side; magnified 79 diameters.
» 7. Same, viewed from the dorsal face (rami of the antennæ not drawn).
» 8. Extremity of one of the antennulæ, highly magnified.
» 9. Prehensile leg of 1st pair.
» 10. One of the testes, with the efferent duct.
» 11. Zoosperms very strongly magnified.

Pl. IV.

Moina tenuicornis, G. O. Sars.

Fig. 1. Adult female, with the matrix distended by rather fully developed embryos, seen from left side; magnified 62 diameters.

Fig. 2. Another female, with winter-eggs and the ephippium in process of formation, viewed from the dorsal face (rami of the antennæ not drawn)
» 3. One of the antennulæ, more highly magnified.
» 4. Leg of 1st pair.
» 5. Outer part of tail.
» 6. Extremity of same, still more highly magnified.
» 7. Ephippium from left side.
» 8. Adult male, viewed from right side; magnified 95 diameters.

Pl. V.

Ilyocryptus sordidus, Lièvin.

Fig. 1. Adult female, with 7 lines of growth, seen from left side; magnified 102 diameters.
» 2. One of the antennulæ, more highly magnified.
» 3. Tail.

Chydorus Leonardi, King.

» 4. Adult female, seen from left side; magnified 120 diameters.
» 5. Tail of same, more highly magnified.

Chydorus globosus, Baird.

» 6. Adult female, seen from left side; magnified 104 diameters.
» 7. Tail of same, more highly magnified.

Pleuroxus inermis, G. O. Sars.

» 8. Adult female, seen from left side; magnified 104 diameters.
» 9. Tail of same, more highly magnified.

Pl. IV.

Alona Whiteleggei, G. O. Sars.

Fig. 1. Adult female, seen from left side; magnified 104 diameters.
» 2. Tail of same, more highly magnified.

Alona pulchella, King.

» 3. Adult female, seen from left side; magnified 104 diameters.
» 4. Tail of same, more highly magnified.

Alona abbreviata, G. O. Sars.

» 5. Adult female, seen from left side; magnified 124 diameters.
» 6. Tail of same, more highly magnified.

Alonella clathratula, G. O. Sars.

» 7. Adult female, seen from left side; magnified 124 diameters.
» 8. Tail of same, more highly magnified.

Camptocercus australis, G. O. Sars.

» 9. Adult female, seen from left side; magnified 104 diameters.
» 10. Tail of same, more highly magnified.

Pl. VII.

Cypria pusilla, G. O. Sars.

Fig. 1 a. Adult female, seen from left side; magnified 45 diameters.
» 1 b. Same, viewed from above.

Trykt den 28de Juli 1896.

Cypris leana, G. O. Sars.

Fig. 2 a. Adult female, seen from right side; magnified 24 diameters.

» 2 b. Same, dorsal view.

» 2 c. Caudal ramus, more highly magnified.

Cypris lateraria, King.

» 3 a. Adult female, seen from right side; magnified 45 diameters.

» 3 b. Same, dorsal view.

» 3 c. Caudal ramus, more highly magnified.

Ilyodromus ellipticus, G. O. Sars.

» 4 a. Adult female, seen from right side; magnified 45 diameters.

» 4 b. Same, dorsal view.

» 4 c. Caudal ramus, more highly magnified.

Cypridopsis minna, King.

» 5 a. Adult female, seen from left side; magnified 45 diameters.

» 5 b. Same, dorsal view.

» 3 c. Caudal ramus, more highly magnified.

Candonopsis tenuis, Brady.

» 6 a. Adult female, seen from left side; magnified 45 diameters.

» 6 b. Adult male, in the same aspect and with the same magnification.

» 6 c. Same, dorsal view.

» 6 d. Caudal ramus, more highly magnified.

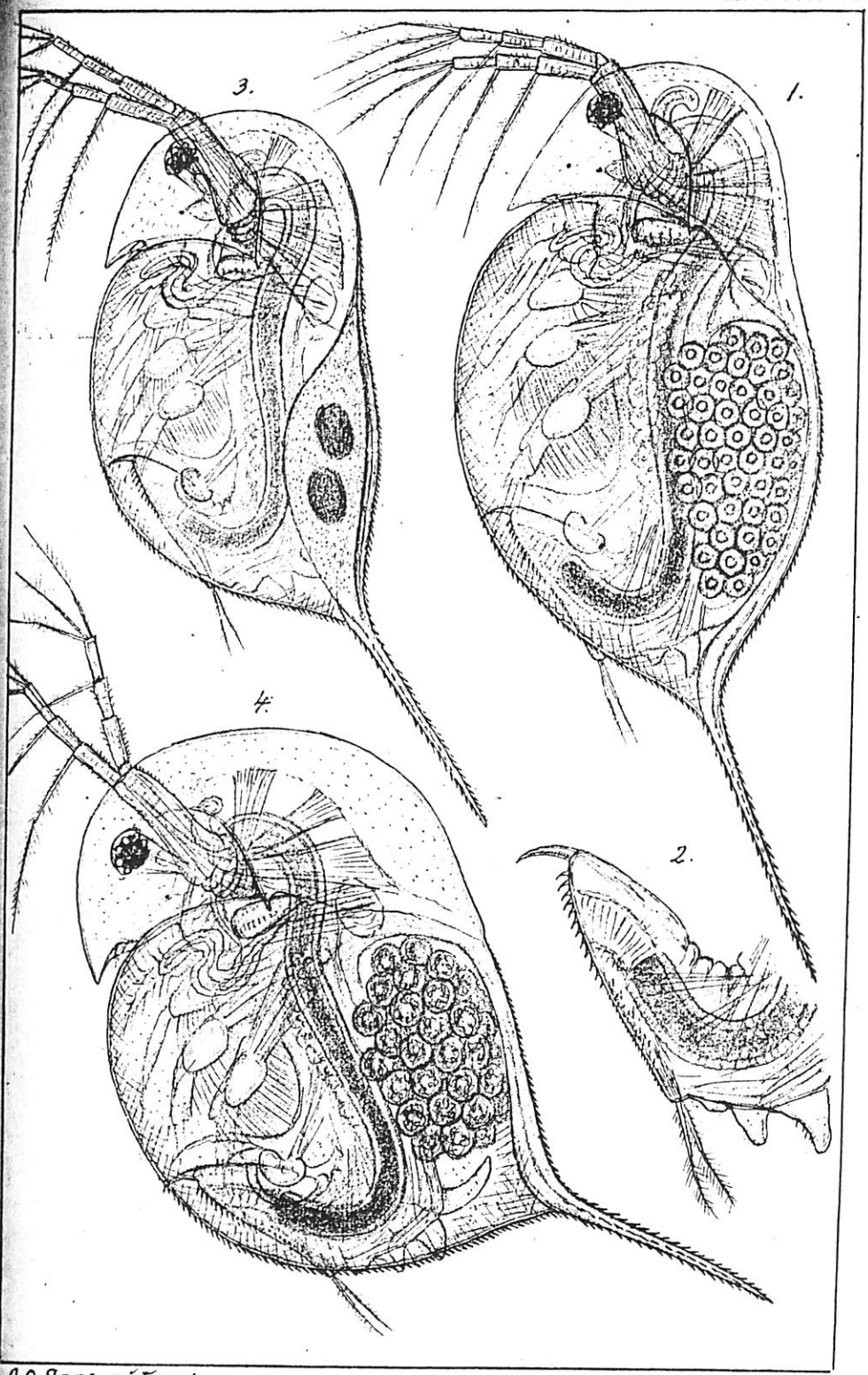
Pl. VIII.

Boeckella robusta, G. O. Sars.

Fig. 1. Adult female, viewed from the dorsal face (left antenna not fully drawn); magnified 35 diameters.
» 2. Same, leg of last pair, more highly magnified.
» 3. Right prehensile antenna of male.
» 4. Last pair of legs of same.

Boeckella minuta, G. O. Sars.

» 5. Adult, ovigerous female, viewed from the dorsal face (right antenna not fully drawn); magnified 68 diameters.
» 6. Same, leg of last pair.
» 7. Last pair of legs of adult male.



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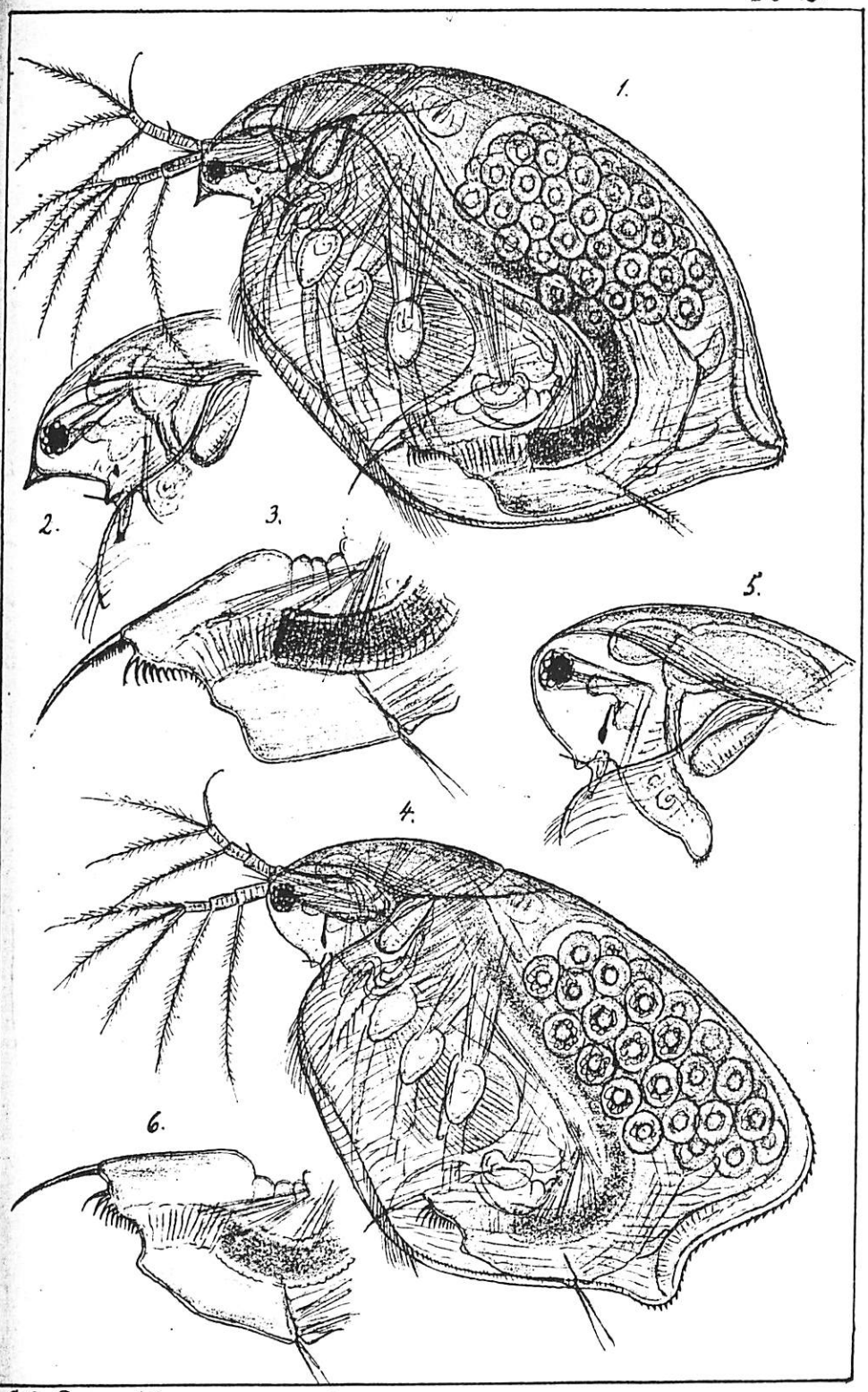

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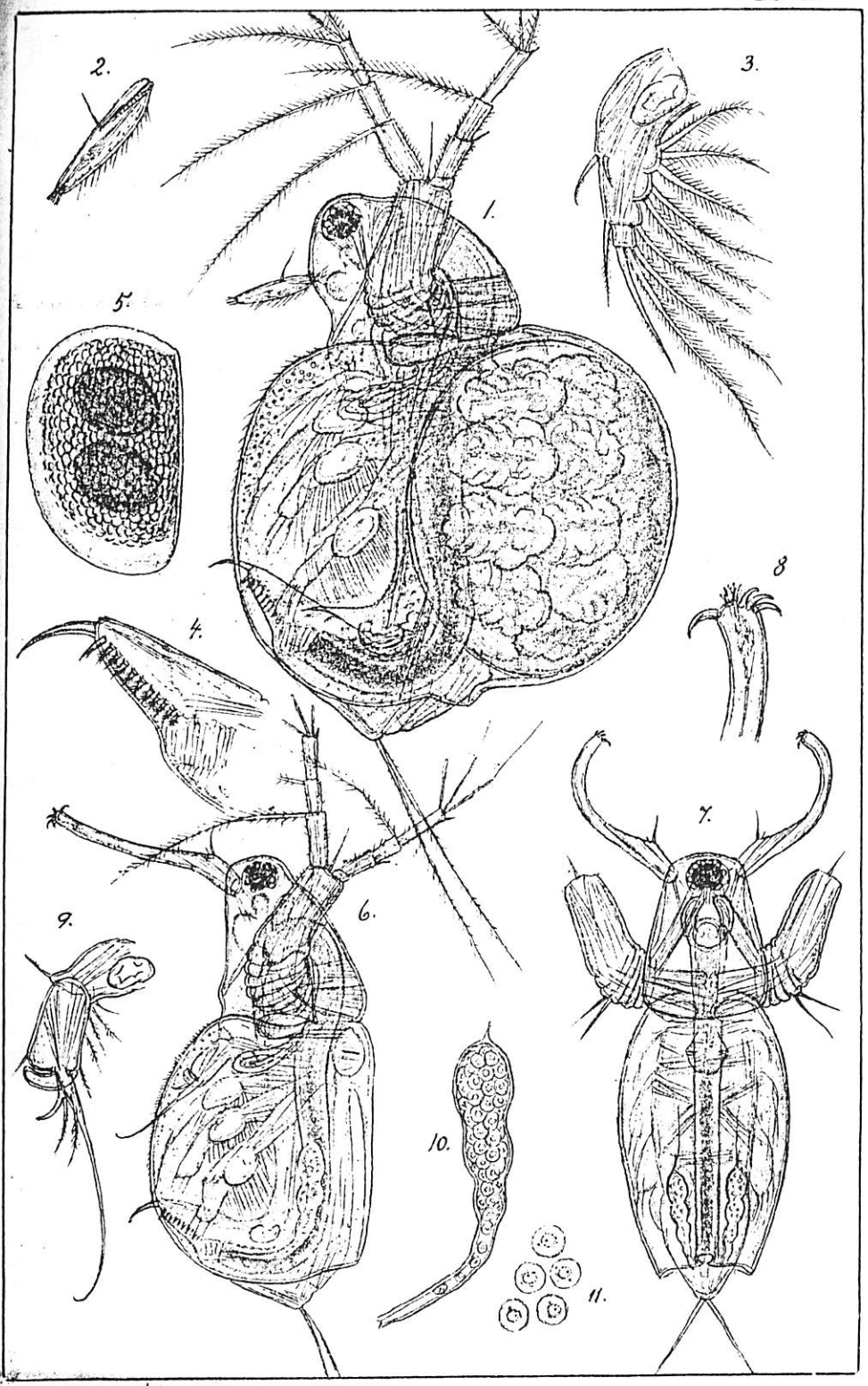

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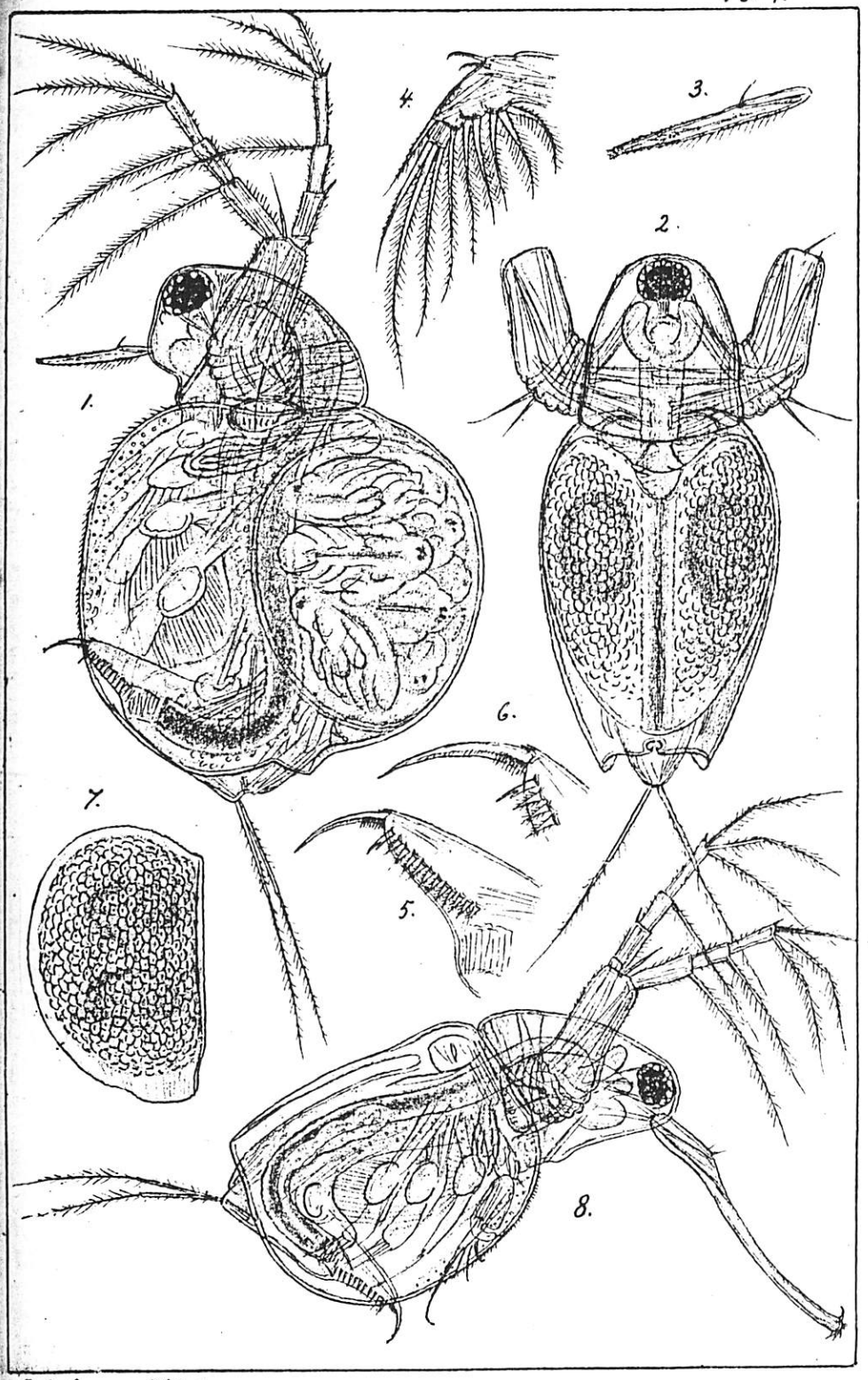

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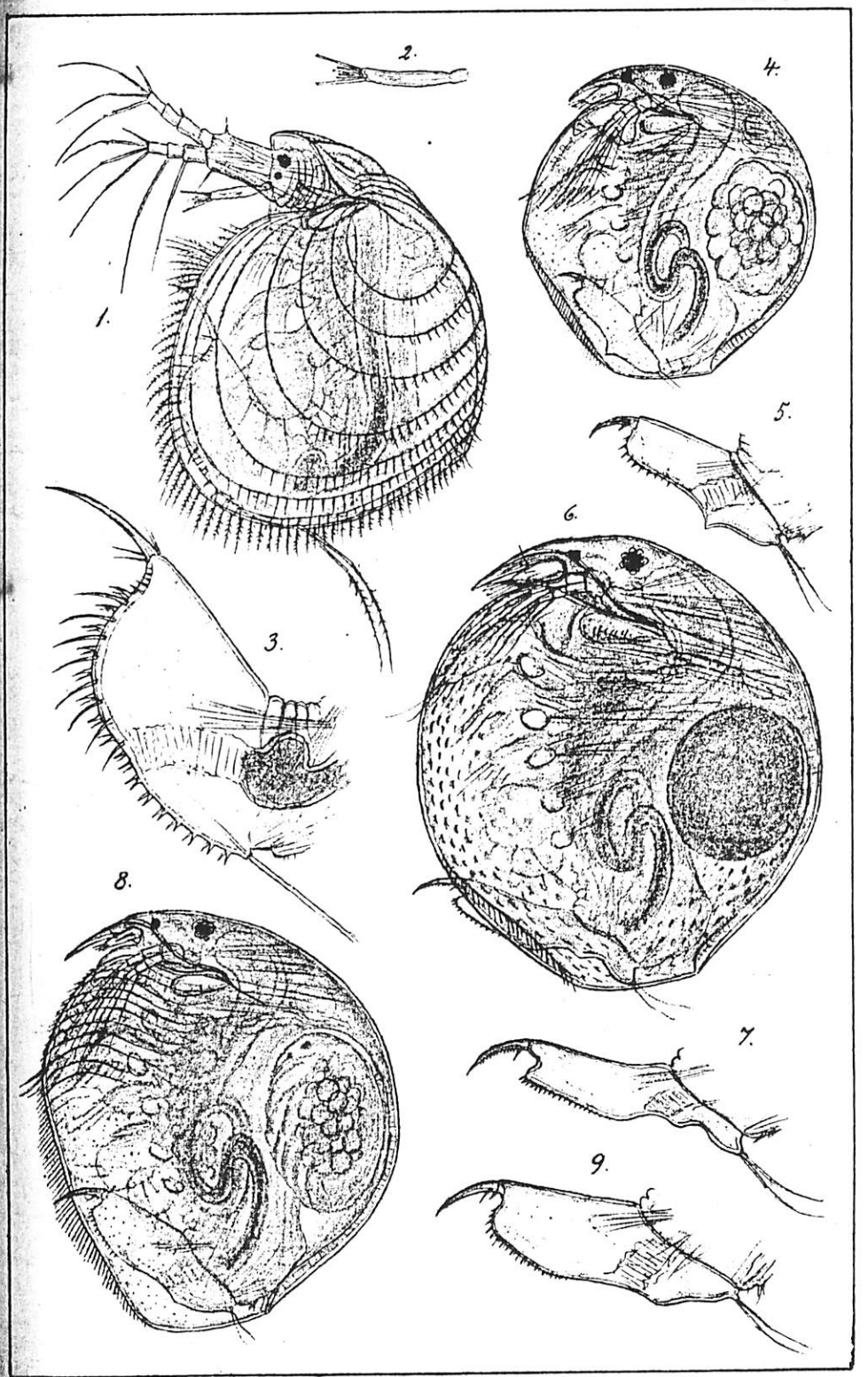

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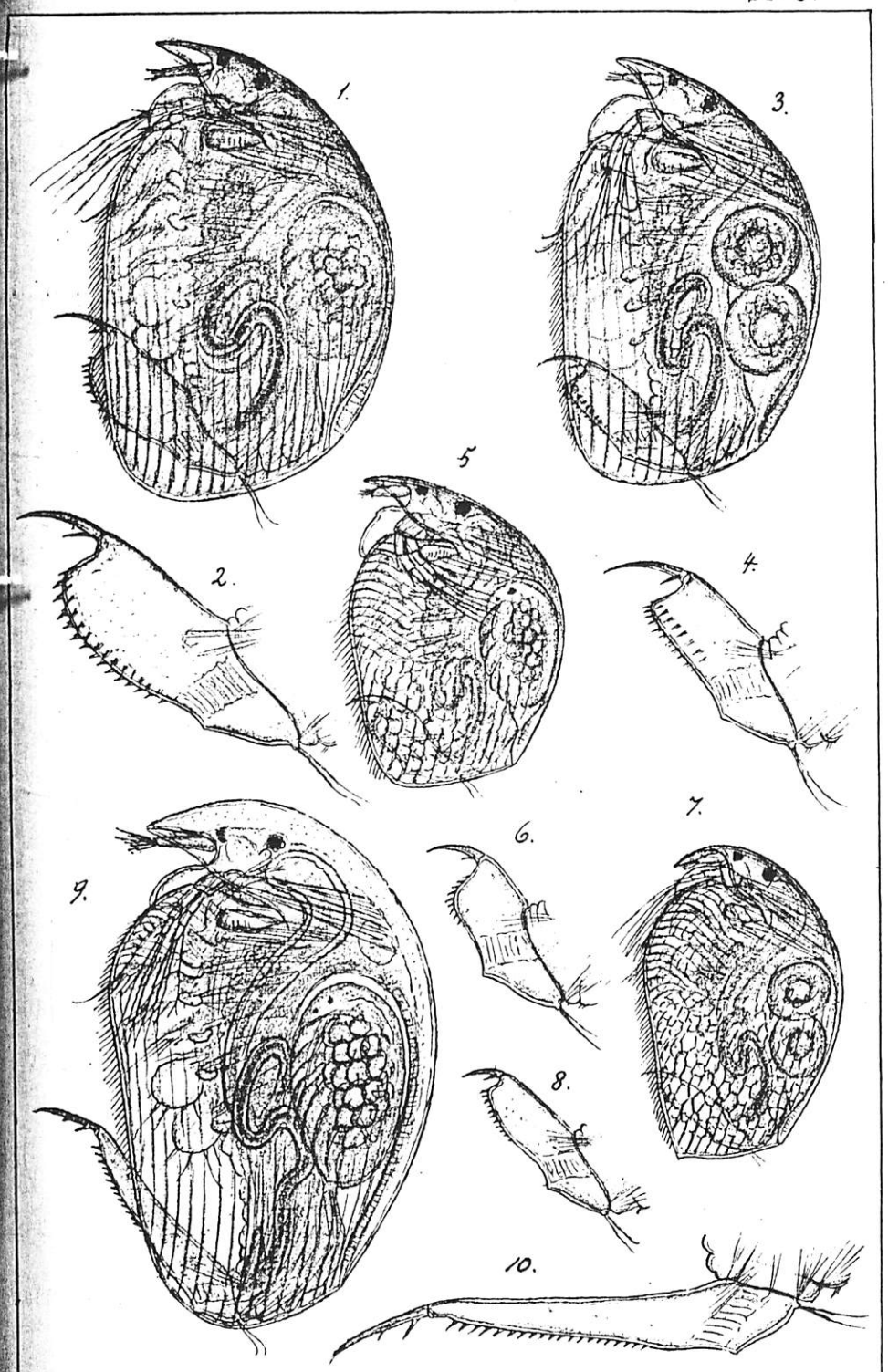

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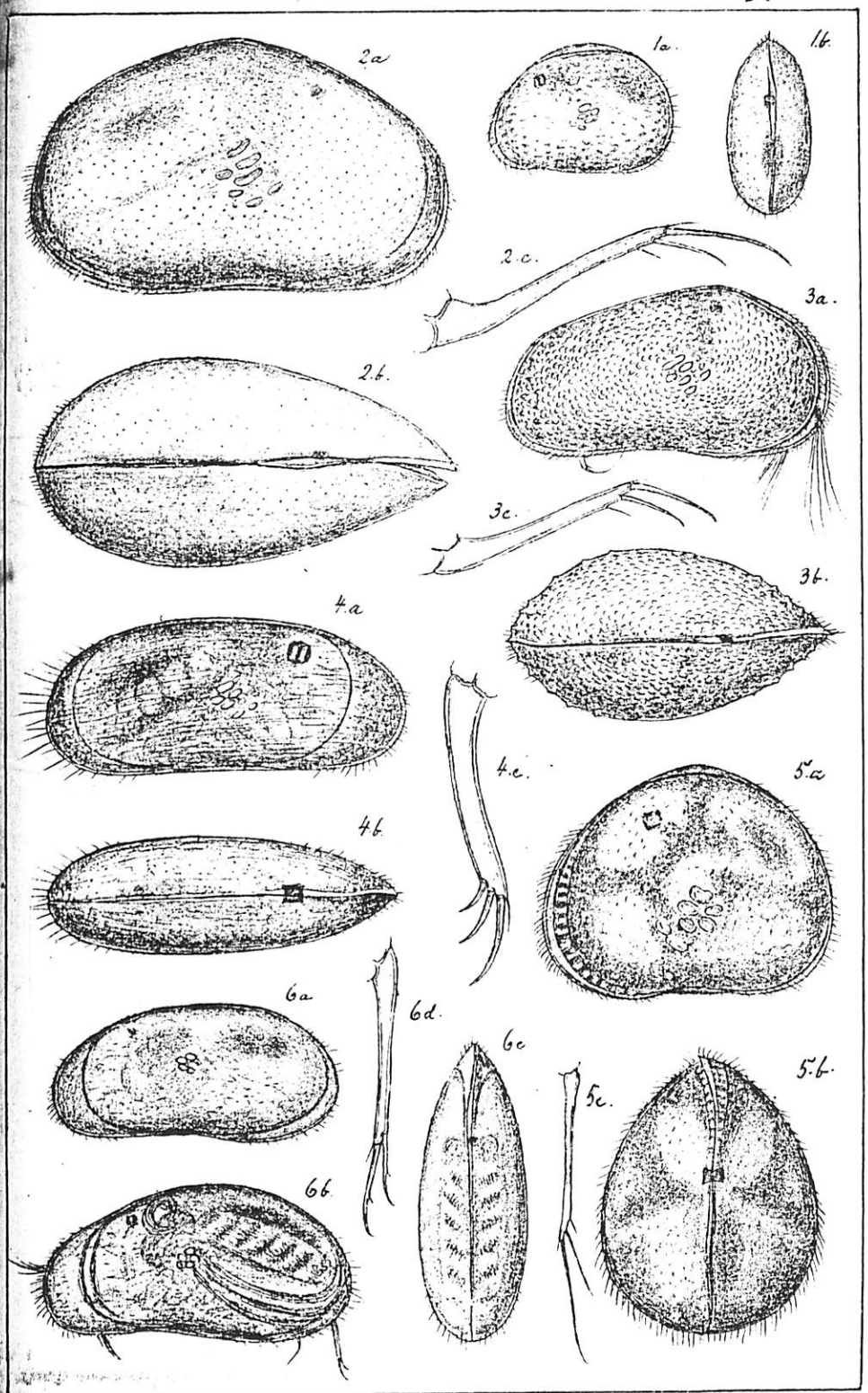

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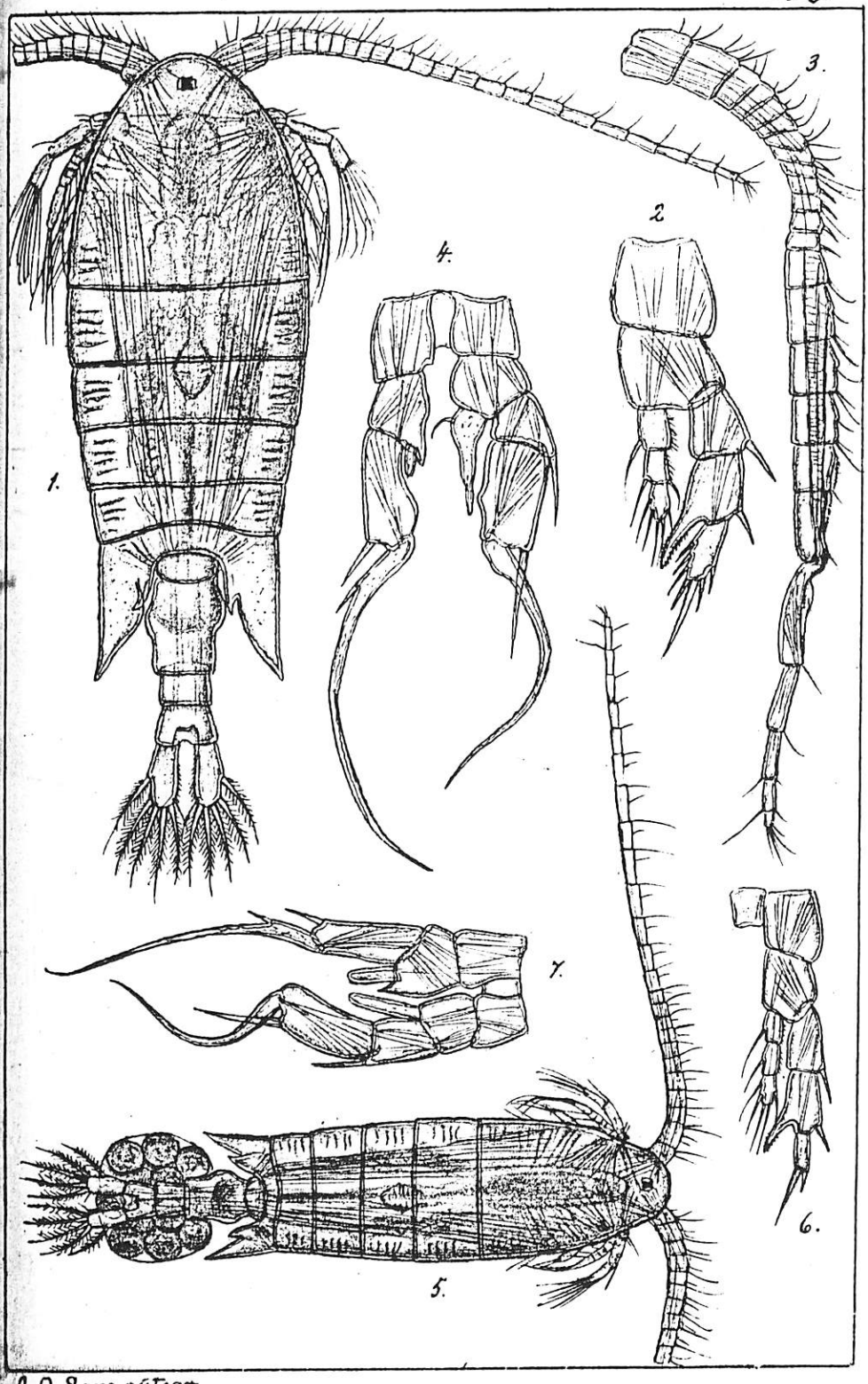

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