III.—THE INVERTEBRATE FAUNA OF THE INLAND WATERS OF SCOTLAND. Part III. By Thomas Scott, F.L.S. (Plates VI., VII.)

Loch Morar, Inverness-shire.

Introduction.

I was requested to visit this loch in September last year (1892), to make an investigation of its invertebrate fauna, and to obtain some information concerning the depth of the loch, the specific gravity of its bottom water, &c.

Mr Anderson Smith, one of the members of the Fishery Board, who was at this time engaged on board the fishery steamer 'Garland,' in carrying on an extensive series of observations—biological and physical—among the islands and fiords of the West of Scotland, assisted me very materially in carrying out the work that I had been requested to take in hand.

I was conveyed on board the 'Garland' to Tarbet, Loch Nevis, where there is a nice sheltered little bay, and where there is a small inn, at which boats and men for Loch Morar may be obtained or arranged for. There is a fairly good road leading from Tarbet Inn to Loch Morar, which is only about three-quarters of a mile, if so much, distant. The inn is nearly midway between the upper and lower ends of the loch, and forms an excellent rendezvous for anglers and others who desire to work the upper as well as the lower ends. Unfortunately, the inn is not readily accessible for visitors, being much out of the way of steamers and coaches. The nearest port of call for steamers is Arisaig, which is, therefore, the usual landing-place for visitors to this district.

The road leading from Tarbet Inn to Loch Morar is formed through what appears to be a 'fault' in the schistoze rocks that form the barrier between Loch Nevis and Loch Morar; this road gradually rises to a height of about 200 feet, then descending towards Loch Morar, it continues westward along the north side and round the lower or west end of the loch, and thence to Arisaig. This is the road by which the postman from Arisaig reaches Tarbet Inn. I understand he comes three times a week to the inn during the summer, and twice a week during the winter months. Tarbet Inn is thus the postal terminus in this district. A little sheltered bay in Loch Morar, opposite Tarbet Bay, Loch Nevis, is called South Tarbet Bay. Along the north side of Loch Morar, from South Tarbet Bay eastward, there is no road deserving the name: there is, indeed, a kind of pathway, but of such a break-neck character that it requires some experience and 'nerve' to traverse it safely. There appears to be no road along the whole of the south side, with the exception of a pathway similar to that described.

Loch Morar is justly described as 'a large and beautiful loch amid 'magnificent scenery;'* it lies nearly due east and west, between stupendous ridges of rocks, sparsely clothed with vegetation, and which, in many places, rise precipitously from the water's edge to summits of over 1000 feet in height, and in one or two instances to summits of over 2000 feet in height, at a distance of less than a half to three-quarters of a mile from the edge of the loch. Towards the lower end the sides, though rugged, are less steep and precipitous. At the upper end three streams

* *Sportsman's Guide to the Rivers, Lochs, Moors, and Deer Forests of Scotland*, September 1890, p. 220.


LOCH NEVIS
Rudha Raonuill
Tom an Nèill
Sithean Mòr
LOCH NAN UAMH

enter the loch from the westward; one of these issues from a deep, gloomy ravine or cañon, which terminates abruptly in bold headlands. The loch is shallow at its extreme upper or east end, and there is a considerable extent of nearly level marsh and meadow land that has probably been formed by the silting up of this part of the loch. The length of Loch Morar, as shown on the 'one-inch' Ordnance Survey Map, is a little over 11½ statute miles, but in the *Sportsman's Guide* it is stated to be 'about '14 miles long;'* the narrowest part (about 3¼ furlongs) is near the east end, at Sron an Drutain, and the greatest width (1 mile 4¾ furlongs) is at the west end, near Bracorina. Several streams flow into the loch along both the north and south sides: the largest is the River Meoble, formed by the overflow waters of Loch Beoraid (a small loch about 3 miles south of Loch Morar), and augmented by several rivulets in its course northwards, to where it falls into Loch Morar, near Camas Luinge, nearly opposite, but a little west of, South Tarbet Bay. The overflow waters of Loch Morar form the River Morar, which, flowing from the west end, and after a tortuous course of about 1¾ miles, falls into the Atlantic. The normal height of Loch Morar is about 31 feet above sea-level, but the height varies considerably according as the season may be wet or dry.

'Loch Morar belongs to Lord Lovat, Mr J. A. Macdonald of Glenala-'dale, Mrs Campbell of Callert, and Mrs Nicholson of Arisaig and Morar; 'it contains salmon, sea-trout, and loch-trout in great abundance, and yields 'good sport to the angler. The loch fishes well all the summer months, 'but salmon never rise well.'† It may be remarked here, by way of comparison, that angling for salmon in Loch Ness—also a deep loch—is usually not very successful, though these fish abound in that loch also.

Depth of Loch Morar.

Loch Morar was sounded at four different places, as near as possible in mid-channel, and here referred to as Stations I., II., III., and IV. The extreme upper end of the loch is shallow, but, proceeding westward from the head of the loch, the depth rapidly increases, so that at Station I. (about 7 furlongs from the head of the loch) the sounding-lead touched bottom at a depth of 59⅔ fathoms (358 feet); the depth continued still further to increase, so that at Station II., a little over a mile from Station I., the sounding-lead touched bottom at 100 fathoms (600 feet). At Station III. (a little west of Aron Mhor, or a little over 3½ miles from the head of the loch) we obtained 103⅔ fathoms (622 feet); the bottom at Stations I. to III. appeared to be rock or gravel. Three soundings were taken in the vicinity of Station IV. (about 3 furlongs west of South Tarbet Bay). The first was with the dredge, which touched bottom, — the line being straight up and down,—at 170 fathoms (1020 feet); when hauled up the dredge-bag contained a quantity of fine mud. The second sounding was taken with the sounding-lead (with reversing thermometers attached); the bottom was touched at 156⅚ fathoms (941 feet). The third sounding was taken with the self-locking water-bottle, let down for a sample of bottom water, and which when hauled up contained a mixture of water and impalpable mud; the water-bottle touched bottom at 145 fathoms (870 feet). The difference in depth shown by these three separate soundings may, I think, be easily accounted for, in this way: the distance of Station IV. from either side of the loch, opposite to where the soundings were taken, is under half a mile; the sides must therefore dip rapidly downward to form a deep, precipitous, sub-aqueous ravine. The drifting of the boat, though but for a short distance, by winds or currents during the time intervening between the one sounding and the other, would thus

* *Loc. cit.*

† *Loc. cit.*

be quite sufficient to account for the difference in depth between the different soundings. The depth of the west portion of the loch was not tested, but the west end is probably comparatively shallow, if one may judge by the numerous islets at that end, and by the contour of the land contiguous to this part of the loch.

Specific Gravity and Temperature of the Bottom Water.

The self-locking water-bottle,* which was let down and touched bottom at 145 fathoms, as already stated, was when hauled up found to be perfectly closed, and filled with water mixed with impalpable mud. This mixture was emptied into a sufficiently large vessel, and when the mud had subsided the supernatant water was run off and tested by one of the set of hydrometers used on board the 'Garland.' The specific gravity registered by this hydrometer was 1007·9; temperature of water at the time the specific gravity was taken, 13·9° C. (57·2° F.) The temperature of the water at the bottom of the loch, taken with a 'Negretti-Zambra' deep-sea reversing thermometer, was 42° F.; at 100 fathoms the temperature was 49·6° F.; and at the surface, 57·7° F. The water, as in the case of many Highland lochs, was of a brown peaty colour.

Invertebrate Fauna.

The bottom mud brought up by the dredge and by the water-bottle at Station IV. was carefully examined, with the result that no living organism could be detected in it; a considerable portion of it consisted of fragments of Entomostracan tests that formed a distinct layer on the surface of the mud after it had been allowed to subside; it thus resembled very closely the mud from the bottom of Loch Ness. The loch was tow-netted in various places from Brinacory eastward to the head of the loch. The tow-net collections were chiefly made at the surface or at a depth of a few fathoms. On one or two occasions, however, the tow-net was attached to the dredge and lowered to a depth of from 50 to 100 fathoms. Entomostraca were found to be abundant at and near the surface, but were much fewer at 50 and 100 fathoms: the grouping of the species, however, appeared to vary very little in the surface and deep-water gatherings. A few gatherings were made by dragging the tow-net through the weeds in the shallow water at the head of the loch, and also close inshore at Brinacory—on the north side of the loch, near Brinacory island. Two days were devoted to the examination of Loch Morar, but the weather was not very favourable. On the first day there was almost continuous rain; the first part of the second day was rather better, but a smart westerly breeze sprang up shortly after noon, which caused the water to become choppy, and made rowing more exhaustive and difficult. Mr Anderson Smith accompanied us the second day, and but for his assistance and encouragement our success, small though it may be, would have been less.

Pelagic Entomostraca, though abundant in Loch Morar at the time of my visit, included comparatively few species, viz., two (or ? three) species of *Copepoda* and five of *Cladocera;* on the other hand, the bottom material, though comparatively poor in number of specimens, was rich in species, especially of *Cladocera*,—the number obtained in the bottom gatherings include eight species of *Copepoda*, five of *Ostracoda*, and sixteen of *Cladocera*. The apparent scarcity of the *Ostracod* group is noteworthy, and is probably attributable to non-suitability of habitat. The physical

* For description of this water-bottle, see *Sixth Annual Report of the Fishery Board for Scotland*, part iii. p. 316, pl. x. (1888).

conditions of fresh-water lochs—as Loch Ness and Loch Morar, where the water is of great depth, and where the shores dip rapidly, leaving very little or no shallow margin—do not seem to favour the development of the *Ostracoda;* and it is interesting to compare in this respect the distribution of the marine species of the same group, which extends from the shore down to many hundreds of fathoms. Another point of interest may be noted here, viz., though several species of Copepoda were obtained, including one or two rare Harpactids, not a single *Canthocamptus* was observed,—not even *Canthocamptus minutus. Gammarus pulex*—the common fresh-water amphipod—was also conspicuous by its absence.

Mollusca appeared to be very scarce: the only species observed were *Limnæa peregra* and *Pisidium pusillum.*

LIST AND DESCRIPTION OF SPECIES.

CRUSTACEA.

COPEPODA.

Family Calanidæ.

Genus *Diaptomus*, Westwood.

Diaptomus gracilis (G. O. Sars).

1863. *Diaptomus gracilus*, G. O. Sars, Oversigt af de indenlandske Ferskvands copepoder, p. 9.

1891. *Diaptomus gracilis*, Brady, Revis. Brit. Cyclop. and Calan., p. 29, Pl. XII. figs. 7–9; Pl. XII. figs. 1–8.

Of common occurrence all over the loch, but comparatively few of the specimens mature.

Family Cyclopidæ.

Genus *Cyclops*, Müller.

Cyclops viridis (Jurine).

1820. *Monoculus quadricornis viridis*, Jurine, Hist. de Monocles, p. 46, Pl. III. fig. 1.

1891. *Cyclops viridis*, Brady, *op. cit.*, p. 17, Pl. V. figs. 6–10.

Common all over the loch.

Cyclops serrulatus, Fischer.

1851. *Cyclops serrulatus*, Fischer, Bull. Soc. Imp. Moscow, vol. xxiv. p. 423, t. x. figs. 22, 23, 26–31.

1891. *Cyclops serrulatus*, Brady, *op. cit.*, p. 18, Pl. VII. fig. 1.

Frequent in bottom material collected at the head of the loch and at Brinacory.

Cyclops ewarti, Brady. (Pl. VI. figs. 1–10).

1888. *Cyclops ewarti*, Brady, Sixth Annual Report of the Fishery Board for Scotland, Part III. p. 232, Pl. VIII. figs. 1–10.

1891. *Cyclops ewarti*, Brady, Revis. Brit. Cyclop. and Calan., p. 22, Pl. VII. figs. 4–7.

Length 1·5 mm. ($\frac{1}{17}$th of an inch). Seen from the dorsal view, body elongate, pyriform, tapering gradually to the abdomen; first cephalo-

thoracic segment equal in breadth to about four-fifths the length, and rather longer than the entire length of the other thoracic segments; forehead moderately broad, somewhat produced and truncate. Anterior antennæ slightly longer than the first thoracic segment, eleven-jointed, moderately stout, and sparingly setiferous; the fifth joint distinctly shorter, the first and seventh subequal and longer than any of the others. The formula shows very nearly the comparative length of the joints:—

23 ·	7 ·	12 ·	8 ·	5 ·	11 ·	22 ·	18 ·	11 ·	16 ·	19 ·
1 ·	2 ·	3 ·	4 ·	5 ·	6 ·	7 ·	8 ·	9 ·	10 ·	11 ·

Posterior antennæ four-jointed, second and third joints smaller than the first and last. A long plumose seta springs from the lower distal extremity of the first joint; opposite to this, on the upper edge, are two short plain setæ: there is a small seta near the middle of the upper margin of the second joint, and on the upper margin of the third joint there is a row of small spiniform setæ arranged in a pectinate manner,—the setæ at the distal being much longer than the posterior ones; the extremity of the posterior antennæ bears a fascicle of setæ, one of which is longer and plumose; the second, third, and last joints are ciliate on the lower margin. The base of the mandible is provided with two long plumose and one very small plain setæ (fig. 4). Anterior footjaws short, four-jointed, the first being equal in length to the other three; the last is very small; the first joint bears three setæ, the second two, and the third and fourth one each. These setæ are furnished with short bristle-like cilia arranged somewhat widely apart; the fourth joint also bears two small terminal plain setæ (fig. 5). Posterior footjaw stout, well developed, four-jointed; the first joint bears two plumose setæ that arise from a papilliform process near the upper distal margin; a seta with bristle-like cilia springs from a conical base of the upper margin of the second joint, at the distal end of the same joint, two similar setæ arise from an elongate digitiform process; the upper part of the distal end of the third joint is produced so as to extend fully beyond the last two small joints, and terminates in a seta similar to those just described and a stout elongate spine (fig. 6). The basal joint of the fifth pair of feet is furnished with one stout seta plumose of the distal half; a long stout seta also plumose on the distal half springs from the end of the second joint; on the upper margin of the same joint, and near the base of the terminal seta, there is a fringe of stout cilia; and a short, moderately-stout spine, serrate on the interior edge, springs from the lower margin. The abdomen tapers very gradually; the posterior margins of the abdominal segments are fringed with small teeth; the last segment is considerably longer than the preceding one. Caudal stylets nearly one and a half times the length of the last abdominal segment. There is a small toothed notch on the outer margin near the middle of the proximal half of each stylet, and a small seta springs from near the middle of the lower half; the terminal setæ are plumose and of moderate length.

This species was first obtained in the upper reaches of the Firth of Forth in Nov. 1887; but though thus apparently a marine species, Dr Brady suggested that its real habitat might be 'in some of the streams or ponds 'whose contents find their way into the Forth.' The discovery of this species in Loch Morar—the second time it has been observed in Scotland—shows that the explanation of its occurrence in the Forth estuary suggested by Dr Brady is probably correct. *Cyclops ewarti* was of frequent occurrence in Loch Morar.

? *Cyclops Kaufmanni*, Uljanin.

1875. *Cyclops Kaufmanni*, Uljanin, Reise in Turkestan (Crust.), p. 38, t. xii., figs. 2–4.

1891. *Cyclops Kaufmanni*, Brady, Revision, p. 24, Pl. VII. fig. 3.

Several specimens of what appears to be this species were obtained in Loch Morar.

Cyclops fimbriatus, Fischer.

? 1785. *Cyclops crassicornis*, Müller, Entomostraca, p. 113, Pl. XVIII. figs. 15–17.

1853. *Cyclops fimbriatus*, Fischer, Bull. Soc. Imp. Moscow, p. 94, Pl. III. figs. 19–28, 30.

1891. *Cyclops fimbriatus*, Brady, *op. cit.*, p. 25, Pl. IX. fig. 1.

This pretty *Cyclops* was moderately frequent in the bottom material collected at the head of the loch.

Family Harpacticidæ.

Genus *Attheyella*, Brady. (See note at p. 235.)

Attheyella spinosa, Brady. (Pl. VI. figs. 11–20.)

1880. *Attheyella spinosa*, Brady, Mon. Brit. Copep., vol. ii. p. 58, Pl. XLIII. figs. 15–18; Pl. XLVI. figs. 13–18.

Female as described by Dr Brady (*op. cit.*).

Male.—The third joint of anterior antennæ dilated exteriorly so as to form a large lobe-like process (fig. 23). Mouth organs and first and second pairs of swimming feet as in the female. Both branches of third pair of swimming feet three-jointed; the first two joints of the outer branches are broad and of about equal length, the second joint is armed on the outer half of the distal end with a strong conical spine slightly curved outward at the extremity, third joint narrow and as long as the other two together; the first two joints of the inner branch are very short, the second being armed with a moderately long spiniform process, the two edges of which instead of being straight are curved in a somewhat irregular zigzag manner; the last joint, which is nearly twice as long as the first two together, is furnished with a long plain terminal seta, besides a short and plumose subterminal one. Fourth pair as in the female. Fifth pair small; basal joint moderately broad, somewhat rounded, but not much produced posteriorly, and provided with two stout plumose setæ; secondary joint elongate-ovate, furnished with several setæ, as shown in the figure (fig. 18). Caudal stylets rather longer than, and not so much dilated as those of the female.

Attheyella spinosa was frequent in the bottom material from the head of the loch, and also in that from Brinacory. The large spines on the outer branches of the third swimming feet of the male form a striking character.

Attheyella cryptorum, Brady. (Pl. VI. figs. 21–31).

1868. *Canthocamptus cryptorum*, Brady, Jour. of Micros. Sci., vol. ix., Pl. VI. figs. 1–10.

1880. *Attheyella cryptorum*, Brady, Mon. Brit. Copep., vol. ii. p. 60, Pl. LII. figs. 1–18.

Length, exclusive of caudal setæ, ·66 mm. ($\frac{1}{38}$th of an inch). The general form is something like that of *Canthocamptus*. Anterior antennæ, of the female, short, moderately stout, eight-jointed. A sensory filament springs from the upper distal angle of the fourth joint. The proportional length of the joints are as follows:—

$$\frac{11 \cdot 11 \cdot 7 \cdot 7 \cdot 6 \cdot 8 \cdot 7 \cdot 10.}{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7 \cdot 8.}$$

The male antennæ are considerably dilated. There is a constriction between the third and fourth joints; the articulation between these forms a hinge to enable the antennæ to be used for grasping; the fifth joint is small, and bears a short stout spine on its upper distal angle, while the sixth joint is furnished with a sensory filament. First pair of swimming feet short, the outer branch three-jointed, the inner two-jointed, both, branches of about equal length, the basal joint of the inner branch stouter and rather shorter than the other; the margins of both joints are fringed with short spiniform setæ; the last joint bears at its distal extremity a moderately short plumose spine, and one short and one long bent subterminal seta; each of the three joints of the outer branch is armed exteriorly with a subterminal and somewhat stout plumose spine, the second joint carries a moderately long seta on the inner distal angle, while the last joint carries two terminal and one long bent subterminal setæ (fig. 24). Inner branches of the third pair scarcely longer than the first two joints of the outer branch, first joint very short; in the male the first joint bears a long stout setaform appendage, which is at least two and a half times the length of the inner branch; there is a small seta at the base of the appendage; the only armature of the second joint—which is somewhat lageniform—consists of two terminal plumose setæ, one being much longer than the other (fig. 27). Inner branches of the fourth pair shorter than the first two joints of the outer branch, first joint very small; the armature of both branches somewhat similar to that of the third pair (female). Fifth pair small, foliaceous; in the female the basal joint bears four long and two short plumose setæ; the long setæ are arranged as follows:—one on the inner and one on the outer margin near the somewhat truncate extremity, and two of them terminal, one of which is considerably longer than either of the other three; the two short setæ spring from the inner margin, as shown in the figure (fig. 29); the second joint is smaller, obliquely truncate, and provided with five setæ, as shown in the figure. In the male the basal joint is boldly convex, and bears two short plumose terminal setæ, second joint small subovate, furnished with one stout, coarsely plumose, and moderately long terminal seta, and two small setæ on the inner and three on the outer margin (fig. 30). Abdominal segments ornamented with two concentric rows of small prickles—one row near the lower and one near the upper margin, but the last row is not so conspicuous as the other. The opercular plate has the edge strongly aculeate. Caudal stylets short, somewhat dilated, and provided with two long terminal unequal setæ, one being about twice the length of the other, and a few short hairs (fig. 31).

This species was described by Dr Brady from specimens obtained by Mr Thomas Atthey, amongst gelatinous algæ growing on the roof of the pit-workings of the low main West Cramlington Colliery, near Newcastle, in 1868: so far as I can learn, it was not known to occur anywhere else till it was obtained in Loch Morar during our examination of that loch. Specimens were sent to Dr Brady, and he was able to recognise them as belonging to the species he had described from the West Cramlington Colliery.

It may be of interest to note here, that quite recently, when examining some material collected by hand-net in the vicinity of Harelaw Dam, Balerno, near Edinburgh, in August 1890, and which had not been examined previously for want of time, several specimens of this interesting species were observed, thus indicating that its distribution may not be so restricted as had been supposed. Its occurrence among the gelatinous algæ on the roof of the pit-workings at West Cramlington is very curious and interesting, and opens up questions respecting distribution of species which, like that of the 'toad in the rock,' may not be easily solved.

Attheyella propinqua sp. n. (provisional name), (Pl. VII. figs. 1–11).

Length, exclusive of caudal setæ, ·7 mm. ($\frac{1}{36}$th of an inch), anterior antennæ rather longer and more slender than those of *Attheyella cryptorum*, but resembling in this respect those of *Attheyella spinosa;* the relative length of the joints is also somewhat different, as shown by the formula—

$$\frac{7 \cdot 7 \cdot 6 \cdot 7 \cdot 6 \cdot 7 \cdot 7 \cdot 8.}{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7 \cdot 8.}$$

The secondary branch of the posterior antennæ is fairly well developed and two-jointed; the first joint bears one terminal seta, the second joint bears two plumose terminal setæ and a marginal one. The mandible, which is elongate and of moderate breadth, has a small two-jointed palp bearing a few setæ (fig. 5). Posterior footjaws two-jointed and armed with a slender terminal claw; the first joint is provided, at the inner distal angle, with a small spiniform seta. First pair of swimming feet short, inner branch rather longer than the outer, and composed of two nearly equal joints (fig. 7). The second, third, and fourth pairs similar to those of *Attheyella spinosa*. Fifth pair, especially in the female, somewhat like those of *Attheyella cryptorum;* those of the female rather larger than in that species; the basal joint is broader and subquadrate, and provided with shorter setæ on the subtruncate end; the second joint is broadly subovate, the outer margin bearing a fringe of cilia in addition to the five terminal and subterminal setæ. Fifth pair in the male smaller than in the male of *Attheyella cryptorum;* the extremity of the produced inner part of the basal joint is subtruncate and provided with two small plumose setæ, second joint ovate with one moderately long plumose and one short plain terminal setæ; there are also two short plumose setæ on the inner margin, and three short setæ on the outer margin. The second, third, and fourth abdominal segments are each furnished with one concentric fringe of short prickles close to the posterior margin, instead of two as in *Attheyella cryptorum*. Seen from the side, the abdomen terminates abruptly, with the fringed opercular plate projecting slightly upward and backward. The male differs little from the female: the anterior antennæ are not so stout as in *Attheyella cryptorum*, and do not possess the strongly developed lobe-like process, which is such a marked character of the male antennæ of *Attheyella spinosa;* the third pair of swimming feet are provided with shorter spines than the third pair of the male of *Attheyella cryptorum*, but are otherwise somewhat similar to those of that species; caudal stylets very short. In bottom material both from the head of Loch Morar and from Brinacory.

The species now described is somewhat intermediate between *Attheyella spinosa* and *Attheyella cryptorum*, but seems more closely allied to the latter; the three forms when placed together are readily distinguished from each other by the form of the abdomen and stylets. In the species now described, the abdomen, viewed laterally, is seen to end abruptly, with the opercular plate showing as a distinct tooth-like process; and the abdominal segments have only one fringe of setæ. In *Attheyella cryptorum*, the abdomen is more slender and ends much less abruptly than in the last species, the opercular plate is less prominent, and there are two rows of setæ on each of the abdominal segments; moreover, the ovisac is somewhat larger, so that the setæ of the fifth feet do not reach to the end of it as in *Attheyella propinqua*. In *Attheyella spinosa* the form of the stylets, which are larger than in either of the other two species, are very characteristic, as are also the curled setæ of the fifth feet. Dissection brings out other more or less important differences as shown by the description and figures.

Genus *Moraria*,* T. and A. Scott.

Ann. and Mag. Nat. Hist., ser. 6, vol. xi. p. 213, March 1893.

Anterior antennæ short, seven-jointed; inner branch of posterior antennæ, small, one-jointed; mandible palp, one-branched, two-jointed; posterior footjaws, three-jointed, provided with a prehensile terminal claw; first pair of swimming feet short; inner branches, two-jointed, not longer than the outer branches, joints subequal; inner branches of the second, third, and fourth pairs much shorter than the outer branches, two-jointed, joints subequal.

This genus somewhat resembles *Cylindropsyllus*, Brady, in form and in some structural details. In the form and structure of the posterior antennæ, mandibles, and first pair of swimming feet it resembles both *Attheyella cryptorum* and *Mesochra robertsoni*, Brady, but it differs very markedly from both *Attheyella* and *Mesochra* in the structure of the second, third, and fourth pairs.

Moraria anderson-smithi, T. and A. Scott. (Pl. VII. figs. 12–26).

1893. *Moraria anderson-smithi*, T. and A. Scott, Ann. and Mag. Nat. Hist., ser. 6, vol. xi. p. 213, Pl. VIII. figs. 1–14.

Length, exclusive of caudal setæ, ·62 mm. ($\frac{1}{40}$th of an inch). Forehead produced into a short rostrum. The anterior antennæ in both male and female are short, stout, and seven-jointed, the male antennæ being hinged between the fourth and fifth joints, and adapted for grasping. The relative length of the joints of the female antennæ are as follows:—

$$\frac{6 \cdot 8 \cdot 6 \cdot 5 \cdot 5 \cdot 7 \cdot 10 \cdot}{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7 \cdot}$$

A stout sensory filament springs from the upper distal angle of the fourth joint in the female and the third in the male. From the same joint in the male there springs a curved spine-like process from a produced basal part. Posterior antennæ short, stout, three-jointed; a small one-jointed secondary branch springs from near the middle of the second joint. Mandibles well developed, having a broad biting part and a one-branched two-jointed palp. The maxillæ consist of a broad masticatory portion and a two-branched appendage; the truncate end of the masticatory portion is armed with five moderately long spine-like teeth; there is also a small seta on the exterior margin; the outer of the two branches of the appendage terminates in a comparatively stout spine, plumose on the outer half, and is also furnished with four small marginal setæ; the inner branch is small, and terminates in a small spine. Anterior footjaws stout, terminating in a stout clawed spine bearing a small seta on its outer margin near the base of the claw; slightly anterior to the claw are two digitiform processes, each of which terminates in a moderately stout spine and an inward curved process not so long as the spine, and bearing several small setæ on its interior distal margin. Posterior footjaws three-jointed; last joint small, bearing a moderately slender, but not very long terminal claw. A stout plumose seta springs from the interior distal angle of the first joint; inner margin of the second joint fringed with cilia. First pair of swimming feet nearly as in *Attheyella cryptorum*, but the last joint of the inner branch is shorter than the first joint, being scarcely three-fourths its length; it is also narrower, and bears a stout terminal spine and two subterminal setæ—one very short and one very long and slender. The second and third pairs of feet in the female are somewhat similar to those of *Mesochra lilljeborgii*, but the first joint is more dilated

* From Loch Morar.

and rather longer than the last, and the whole inner branch is rather shorter than the first two joints of the outer branch. In the male the last joint of the inner branch of the second pair is much smaller than the first, and is armed with a long terminal spine and a subterminal seta; the first joint bears a stout conical tooth-like process, slightly hooked at the end on the outer aspect, and a seta on the inner margin. The fourth pair have the inner branches scarcely reaching to the middle of the second joint of the outer branches; the spines of the first and second joints are much longer than the joints to which they are attached; the inner of the three terminal spines of the last joint, is of considerable length, and, like the middle spine, is ciliate along one side. Fifth pair in both sexes somewhat similar to *Attheyella*, but the armature is shorter and stouter (figs. 25, 26). Caudal stylets about equal in length to the last abdominal segment. The abdomen in the male consists of five, in the female of four segments, the first and second segments in the female being coalesced.

Moraria anderson-smithi was obtained in gatherings of bottom material both from the head of the loch and from Brinacory; it appeared to be a rather scarce species in both gatherings, but was, if anything, more frequent in the last.

During our study of the closely allied genera,—*Attheyella*, *Moraria*, and *Mesochra*,—it seemed to us that the first and last of these, included species that differed considerably from each other. For example, *Attheyella spinosa* (including the male form) appears to belong to quite a different type from that of *Attheyella cryptorum*; *Attheyella spinosa* has both branches of the first pair of swimming feet three-jointed and of moderate length, while in *Attheyella cryptorum* the first pair is short, with the inner branches composed of two nearly equal joints. Moreover, in *Attheyella spinosa*, the male antennæ and the inner branches of the male third pair of feet, are strikingly different from those of *Attheyella cryptorum*. On the other hand, *Mesochra lilljeborgii* has the inner branches of the first pair elongate and two-jointed, the first joint being longer than the entire length of the outer branch; while *Mesochra robertsoni* has the first pair short, both branches of about equal length, and with the inner branches composed of two subequal joints, thus differing very distinctly from *Mesochra lilljeborgii*, but agreeing very closely with *Atheyella cryptorum* and with *Attheyella propinqua*. After summarising all the points in which the various species referred to agree and in which they differ, we are inclined to think that, while *Attheyella spinosa* and *Mesochra lilljeborgii* may be considered as the types of the genera to which they belong, the others, *Attheyella cryptorum*, *Attheyella propinqua*, and *Mesochra robertsoni*, form a distinct and closely related group, which if removed from the genera where they are at present located and included in a separate genus or subgenus, the systematic study of these various forms would be somewhat simplified.

OSTRACODA.

PODOCOPA.

Family Cyprididæ.

Genus *Cypria*, Zenker.

Cypria serena (Koch).

1838. *Cypris serena*, Koch, Deutchlands Crustaceen, H. xxi. 22.

1868. *Cypris lævis*, Brady, Mon. Rec. Brit. Ostrac., p. 374, Pl. XXIV. figs. 6–8.
1889. *Cypria serena*, Brady and Norman, 'Mon. M. and F. W. Ostrac. of the N. Atlantic and N.W. Europe, p. 70.

In bottom material from the head of the loch, rather scarce.

Cypria ophthalmica (Jurine).
1820. *Monoculus ophthalmicus*, Jurine, Hist. des Monocles, p. 178, Pl. XIX. figs. 16, 17.
1868. *Cypris compressa*, Brady, *op. cit.*, p. 372, Pl. XXIV. figs. 1–5; Pl. XXXVI. fig. 6.
1889. *Cypria ophthalmica*, Brady and Norman, *op. cit.*, p. 69, Pl. XI. figs. 5–9.

In the same material with the last, rather scarce.

Genus *Cyclocypris*, Brady and Norman.

Cyclocypris globosa (G. O. Sars).
1863. *Cypris globosa*, G. O. Sars, Om en i Sommeren 1862 foretagen zoologisk Reise i Christianias og Trondhjems Stifter, p. 27.
1868. *Cypris cinerea*, Brady, *op. cit.*, p. 374, Pl. XXIV. figs. 39–42; Pl. XXXVI. fig. 7.
1889. *Cypris globosa*, Brady and Norman, *op. cit.*, p. 71, Pl. XIV. figs. 1, 2; Pl. XI. figs. 10–18.

In bottom material collected at Brinacory, scarce.

Genus *Candona*, Baird.

Candona candida (Müller).
1785. *Cypris candida*, Müller, Entomostraca, p. 62, Pl. VI. figs. 7–9.
1889. *Candona candida*, Brady and Norman, p. 98, Pl. X. figs. 1, 2, 14–23.

In bottom material from the head of the loch, scarce.

Candona kingsleii (Brady and Robertson).
1870. *Candona kingsleii*, Brady and Robertson, Ann. and Mag. Nat. Hist., ser. iv. vol. vi., Pl. V.
1889. *Candona kingsleii*, Brady and Norman, *op. cit.*, p. 102, Pl. IX. figs. 19–22; Pl. XIII. fig. 19.

Also in bottom material from the head of the loch.

CLADOCERA.

CALYPTOMERA.

Family Sididæ.

Genus *Latona*, Straus.

Latona setifera (Müller). (Pl. VII. fig. 27.)
1821. *Latona setifera*, Straus, Mem. Mus. d'Hist. Nat.

This curious Cladoceran was obtained very sparingly in a bottom gathering from close inshore at Brinacory. *Latona setifera* was first

recorded as British by Conrad Beck in the *Journal of the Microscopical Society* for December 1883, and is there described and figured. Herrick, in *Crustacea of Minnesota* (1884), states that it 'is not yet recognised in 'Minnesota, but was found by Professor Birge in Lake Michigan.'

Latona is distinguished from other British Cladocera by, among other characters, the structure of the posterior antennæ. The inner branches of these appendages are two-jointed; the distal portion of the basal joint next the outer branch, is continued forwards in a leaf-like process to fully half the length of the second joint, as shown in the figure. The Loch Morar specimens were small—under 1 mm.—but the size appears to vary. Mr Conrad Beck states that specimens 2·5 mm. ($\frac{1}{10}$th of an inch) are often obtained.*

Family Holopedidæ.

Genus *Holopedium*, Zaddach.

Holopedium gibberum (Zaddach).

1855. *Holopedium gibberum*, Zaddach, Wiegman's Archiv. für Naturges., Bd. xxi. p. 159, Pl. VIII. fig. 9.

This remarkable species was common in Loch Morar, and especially so near the surface of the water. It appears to be widely, but perhaps not generally, distributed. In the Fishery Board's Ninth Annual Report there are records of its occurrence in Loch Ness, Loch Oich, and Loch Lochy, Inverness-shire. It is distinguished by the greatly elevated and hood-like form of the brood-pouch. They frequently measure over an eighth of an inch from the apex of the brood-pouch to the under side of the body. When seen adhering to the tow-net after being removed from the water, they closely resemble at first sight the little medusiform gonophores sometimes so abundant in the sea.

Family Daphnidæ.

It is noteworthy that no species belonging to this family were obtained in Loch Morar at the time of our visit.

Family Bosminidæ.

Genus *Bosmina*, Baird.

Bosmina longispina, Leydig.

1860. *Bosmina longispina*, Leydig.

This species was very abundant in Loch Morar. It is readily distinguished from *Bosmina longirostris* by its much greater size and by the larger postero-ventral spine-like processes of the carapace.

Family Macrothricidæ.

Genus *Macrothrix*, Baird.

Macrothrix laticornis (Jurine). (Pl. VII. figs. 28, 29.)

1820. *Monoculus laticornis*, Jurine, Hist. des Monocles, p. 151, Pl. XV. figs. 6, 7.

1850. *Macrothrix laticornis*, Baird, Brit. Entom., p. 103, Pl. XV. fig. 2.

* C. Beck, *op. cit.*, p. 782.

This is a small species, being only about ·5 mm. ($\frac{1}{50}$th of an inch). It was obtained in the gathering of bottom material from Brinacory; only a few specimens were obtained. The figure represents an apparently adult form, and the post-abdomen.

Family Lyncodaphnia, G. O. Sars (1861).

Genus *Ilyocryptus*, G. O. Sars.

Ilyocryptus sordidus (Lievin).

1858. *Acanthocercus sordidus*, Lievin.

1861. *Ilyocryptus sordidus*, G. O. Sars, Om de i Omeg. af Christiania forekom. blad., p. 12.

A few specimens of *Ilyocryptus sordidus* were obtained in a gathering of bottom material from the shallow water at the head of the loch. It appears to be a moderately common species where the conditions are favourable, it was very common in June 1890 among vegetable mud on the south shore of Loch Leven, Kinross-shire; and in July 1892 by the side of Lochend Loch, near Edinburgh.

Family Lynceidæ.

Genus *Eurycercus*, Baird.

Eurycercus lamellatus (Müller).

1776. *Lynceus lamellatus*, Müller, Zool. Dan. Prod., No. 3396.

1850. *Eurycercus lamellatus*, Baird, Brit. Entom., p. 124, Pl. XV. fig. 1.

A few specimens of this large and well-known species were obtained in the same gathering with the last.

Genus *Acroperus*, Baird.

Acroperus harpæ, Baird.

1835. *Lynceus harpæ*, Baird, Trans. Berw. Nat. Club, vol. i. p. 100, Pl. II. fig. 17.

1850. *Acroperus harpæ*, idem, Brit. Entom., p. 129, Pl. XVI. fig. 5.

This is not unlike *Camptocercus macrourus* in form, but much smaller. A few specimens only were obtained.

Genus *Camptocercus*, Baird.

Camptocercus macrourus (Müller).

1776. *Lynceus macrourus*, Müller, Zool. Dan. Prod., No. 2397.

1850. *Camptocercus macrourus*, Baird, Brit. Entom., p. 128, Pl. XVI. fig. 9.

This *Lynceid* is readily distinguished by the elongated narrow post-abdomen and *Acroperus*-like form of the carapace. Several specimens were obtained in bottom gatherings, both from the head of the loch and from the shore at Brinacory.

Genus *Alonopsis*, G. O. Sars.

Alonopsis elongata, G. O. Sars.

1862. *Alonopsis elongata*, G. O. Sars, Om de i Omeg. af Christ. forekom. blad., Andet Bidrag., p. 41.

Frequent in the same gatherings with the last.

Genus *Graptoleberis*, G. O. Sars.

Graptoleberis testudinarius (Fischer).

1851. *Lynceus testudinarius*, Fischer, Mem. de Lav. étrangers, St Petersbourg, vol. vi. p. 191, Pl. IX. figs. 3–6.
1862. *Graptoleberis reticulata*, G. O. Sars, op. cit., Andet Bedrag., p. 41.
1884. *Graptoleberis testudinarius*, Herrick, Crust. of Minnesota, p. 90.

The peculiar hood-like portion of the carapace that forms the head imparts a distinctive appearance to this species. It was very scarce in the Loch Morar gatherings, one or two specimens only being obtained in bottom material from the head of the loch.

Genus *Alona*, Baird.

Alona guttata, G. O. Sars.

1862. *Alona guttata*, G. O. Sars, op. cit., Andet Bidrag., p. 38.

This *Alona* was one of the more common of the smaller species in the gatherings of bottom material. The carapace viewed laterally is sub-quadrilateral in form, and the surface of the carapace is usually ornamented by being thickly covered with puncture-like markings. By means of the form and sculpture of the carapace the species is readily distinguishable among its more common associates.

Alona costata, G. O. Sars.

1862. *Alona costata*, G. O. Sars, op. cit., Andet Bidrag., p. 38.

In the same material with the last, but much scarcer. This species, though somewhat like the last, wants the peculiar puncture-like markings; it is rather longer in proportion to the breadth, and there are usually impressed parallel longitudinal lines observable on the carapace.

Alona quadrangularis (Müller).

1776. *Lynceus quadrangularis*, Müller, Zool. Dan. Prod., p. 199, No. 2393.
1850. *Alona quadrangularis*, Baird, Brit. Entom., p. 131, Pl. XVI. fig. 4.

In the gatherings of bottom material, but not very common.

Genus *Alonella*, G. O. Sars.

Alonella exigua (Lilljeborg).

1853. *Lynceus exiguus*, Lilljeborg, De Crust. in Scenia, p. 79, Pl. VII. figs. 9–10.

This is a very small species—rather less than the $\frac{1}{70}$th of an inch—but distinguishable by the broadly ovate form of the carapace, and the distinctly toothed posterior angle of the front margin. It appeared to be a scarce species.

Alonella nana (Baird).

1843. *Acroperus nanus*, Baird, Ann. and Mag. Nat. Hist., vol. ii. p. 92, Pl. III. fig. 8.
1862. *Alonella pygmæa*, G. O. Sars, *op. cit.*, Andet Bidrag., p. 52.

This was also apparently a rare species, but from its small size—less than the $\frac{1}{100}$th of an inch—it is easily overlooked. It is readily distinguished by the beautiful sculpture of the shell.

Genus *Peracantha*, Baird.

Peracantha truncata (Müller).

1781. *Lynceus truncatus*, Müller, Entom., p. 75, Pl. II. figs. 4–6.
1850. *Peracantha truncata*, Baird, Brit. Entom., p. 136, Pl. XVI. fig. 1.

This also was one of the rarer species, and, like the two previous forms, was only obtained in the gatherings of bottom material.

Genus *Leptorhynchus*, Herrick.

Leptorhynchus falcatus (G. O. Sars). (Pl. VII. fig. 30.)

1861. *Alona falcata*, G. O. Sars, *op. cit.*, p. 20.
1862. *Harporhynchus falcatus*, idem, ibidem, Andet. Bidrag., p. 41.
1884. *Leptorhynchus falcatus*, Herrick, Crust. of Minnesota, p. 114.

The long slender curved beak of this species (fig. 30) enables it to be readily distinguishable. It was of frequent occurrence in the bottom material only; both males and females were obtained. The beak of *Leptorhynchus falcatus* is said to exceed in length that of any known species of Lyncied. Norman and Brady* record it from 'Sweet-hope and Green Lee Lochs, Northumberland; Lochend Loch, Kirkcudbrightshire; and Lochmaben Castle Loch, Dumfriesshire;' and add, in 'all these localities it was numerically scarce.'

Genus *Chydorus*, Leach (1816).

Chydorus sphæricus (Müller).

1776. *Lynceus sphæricus*, Müller, Zool. Dan. Prod., No. 2932.
1816. *Chydorus mülleri*, Leach, Encyclop. Brit., Supp. Art. Annulosa.
1863. *Chydorus sphæricus*, Baird, Ann. and Mag. Nat. Hist., vol. ii. p. 89, t. 2, figs. 11–13.

Frequent, and only in gatherings of bottom material, both from the head of the loch and from Brinacory.

GYMNOMERA.

Family Polyphemidæ, Baird, 1845.

Genus *polyphemus*, Müller.

Polyphemus pediculus (Linné).

1746. *Monoculus pediculus*, Linné, Taun. Suec., No. 2048.
1776. *Polyphemus oculus*, Müller, *op. cit.*, No. 2417.
1850. *Polyphemus pediculus*, Baird, Brit. Entom., p. iii. t. xvii., fig. 1.

Taken in abundance with the tow-net, near the surface of the water, all over the portion of the loch examined.

Genus *Bythotrephes*.

Bythotrephes longimanus, Leydig.

This species was frequent in the surface tow-net gatherings; it was also

* A Mon. of the Brit. Bosmin., Macroth., and Lynceidæ, p. 36.

obtained, though sparingly, in gatherings from fifty and one hundred fathoms, but probably some of the specimens may not have been obtained at the depths stated, but may have entered the net when it was being hauled up.

Family Leptodoridæ.

Genus *Leptodora*, Lilljeborg.

Leptodora hyalina, Lilljeborg.

This beautiful and interesting Cladoceran was frequent in some of the surface tow-net gatherings, but its extreme transparency when living enables it usually to escape observation, except by those who are more or less accustomed with the method of hunting for such organisms.

It will be observed from what has been stated in the foregoing notes on the results of my examination of Loch Morar, that this loch contains an abundant and interesting crustacean fauna which is well suited as a food supply for its numerous finny inhabitants. In this respect Loch Morar compares very favourably with Loch Ness, that somewhat resembles Loch Morar both in size and physical conditions. A partial examination of Loch Ness was made on two occasions during the summer of 1890, * when *Entomostraca* were found to be much less numerous than they were in Loch Morar in 1892. On the other hand, Loch Leven, Kinross-shire, which is a comparatively shallow loch, though covering a considerable area, and which was examined also in 1890, * closely resembled Loch Morar in the abundance of its crustacean fauna. There was of course some difference in the proportion and in the kinds of associated species, but this difference is of comparatively small importance when the organisms are considered from the utilitarian point of view of their value as a food supply for fishes, as almost all the micro-crustacea are of equal importance in this respect. Moreover, Loch Morar, like Loch Leven, is reputed to be a loch where the angler is almost certain of a good and successful day's fishing; but being so much out the way and so difficult of access, comparatively few anglers visit Loch Morar.

Note on *Attheyella*, Brady (see page 225).

The following information was obtained after the preceding notes were in the press :—

G. O. Sars, in a paper entitled 'Oversigt af de indelandske Fersk-'vands-copepoder,' published in Christiania by Brøgger & Christie in 1863, described among other things three species of *Canthocamptus*, new to science, viz., *Canthocamptus crassus*, *Canthocamptus pygmæus*, and *Canthocamptus brevipes*, but without illustrative figures.

In 1883 Professor Lilljeborg exhibited a collection of crustacea at the International Fisheries Exhibition held that year in London. This collection, which included the three species of *Canthocamptus* here referred to, was secured by the Rev. A. M. Norman, F.R.S., and added to his extensive museum.

Through the kindness of Dr Norman, my son, Mr Andrew Scott, was recently favoured with an opportunity of examining Lilljeborg's specimens of Sars' *Canthocamptus*, and of comparing them with the description of

* See Part III. of the Ninth Annual Report of the Fishery Board for Scotland.

the species contained in the work of that author; and while doing so, he recognised a close resemblance between *Canthocamptus crassus*, G. O. Sars, and *Attheyella spinosa*, Brady, and between *Canthocamptus pygmæus*, G. O. Sars, and *Attheyella cryptorum*, Brady; a further examination tended still more to confirm the identity of the two species of G. O. Sars with the corresponding species described by Dr Brady.

Should my son's identification prove to be correct, the specific names adopted by Professor Brady will necessarily give place to those of Professor G. O. Sars, and in that case the nomenclature of the two species will stand thus:—*Attheyella* (*Canthocamptus*) *crassa* (G. O. Sars) = *Attheyella spinosa*, Brady. *Attheyella* (*Canthocamptus*) *pygmæa* (G. O. Sars) = *Attheyella cryptorum*, Brady.

The following is Professor G. O. Sars' description of the species referred to:—

(1) *Canthocamptus crassus*, G. O. Sars (*loc. cit.*, p. 23).

'Corpus quam in specibus ceteris robustus segmentis abdominalibus 'postice attenuatis in margine postico subtus et ad latera pilis vel aculeis 'sat longis pectenatim ornatis. Rami caudalis forma singulari fere ovati et 'ad basim valde constricti setis apicalibus brevibus er valde divergentibus; 'setæ intermediæ duoæ insolito modo flexuosæ in medio sparsim cilliatæ 'exteriore quam interiore triplo breviore. Antennæ 1 mi paris sat crassæ 'setis longis dense obsitæ. Ramus interior pedum 1 mi paris 3-articulatis 'exterior aliquanto longior in paribus sequentibus 3st brevissimus et 'biarticulatus. Pedum 5 ti paris articulus basilis introrsum parvum dilatatus et ut articulus ultimus setis longissimus præditus. Color albidus, longit circit $\frac{3}{4}$ mm.'

(2) *Canthocamptus pygmæus*, G. O. Sars (*loc. cit.*, p. 21).

'Corpus postice parum attenuatum segmentis abdominalibus sat crassis 'versus marginem posteriorem ad latera et subtus serie transversa aculeorum 'instructis. Rami caudales brevissimis latioris quam longiores setis 'majoribus apicalibus duabus sat divergentibus in medio aculeatis, 'exteriore dimidiam longitudinem interioris æquante. Operculum anale 'dentatum, dentibus majusculis. Antennæ 1 mi paris brevissimæ pedun-'culo (articulis basilibus 4-composito) crasso flagello vero valde attenuato. 'Ramus interior pedum 1 mi paris exteriore paullo brevior ut in paribus 'sequentibus duobus biarticulatus, in pari 4 to unarticulatus minimus 'articulo 1 mo rami exterioris vix longior. Pedum 5 ti paris biarticula-'torum, articulus 1 mus introrsum in processum foliiformen magnum et 'setiferum articulatum ultimum minimum et rotundatum longe superantem 'exit. Oculus minimus a margine antico capitis remotus saccus oviferus 'elongato-ovatus. Animal sat pellucidum colore plerumque albido interdum 'leviter rubicundo longit vix $\frac{1}{2}$ mm.'

The species provisionally described in this paper on the fauna of the Inland Waters of Scotland under the name of *Attheyella propinqua* may probably be identical with Sars' *Canthocamptus brevipes;* but as there are apparently one or two important differences between them, it seems better for the present to retain the specific name adopted in this paper.

EXPLANATION OF THE PLATES.

Plate VI.

Cyclops ewarti, Brady.

Fig. 1. Adult female, dorsal view, ... × 50
Fig. 2. Anterior antenna, ... × 168
Fig. 3. Posterior antenna, ... × 126
Fig. 4. Mandible and palp, ... × 168
Fig. 5. Anterior footjaw, ... × 126
Fig. 6. Posterior footjaw, ... × 126
Fig. 7. Foot of first pair, ... × 168
Fig. 8. Foot of fourth pair, ... × 168
Fig. 9. Foot of fith pair, ... × 380
Fig. 10. Abdomen and caudal stylets, . . . × 96

Attheyella spinosa, Brady.

Fig. 11. Adult female, side view, ... × 46
Fig. 12. Anterior antenna, female, ... × 336
Fig. 13. Anterior antenna, male, ... × 336
Fig. 14. Foot of first pair, ... × 253
Fig. 15. Foot of third pair, male, ... × 253
Fig. 16. Foot of fourth pair, ... × 253
Fig. 17. Foot of fifth pair, female, ... × 253
Fig. 18. Foot of fifth pair, male, ... × 336
Fig. 19. Abdomen and caudal stylets, female, . . × 126
Fig. 20. Abdomen and caudal stylets, male, . . × 126

Attheyella cryptorum, Brady.

Fig. 21. Adult female, side view, ... × 80
Fig. 22. Anterior antenna, female, ... × 506
Fig. 23. Anterior antenna, male, ... × 380
Fig. 24. Foot of first pair, ... × 253
Fig. 25. Foot of second pair, male, ... × 253
Fig. 26. Foot of third pair, female, ... × 253
Fig. 27. Foot of third pair, male, ... × 253
Fig. 28. Foot of fourth pair, ... × 253
Fig. 29. Foot of fifth pair, female, ... × 253
Fig. 30. Foot of fifth pair, male, ... × 380
Fig. 31. Abdomen and caudal stylets, . . . × 100

Plate VII.

Attheyella propinqua, n. sp.

Fig. 1. Adult female, side view, ... × 80
Fig. 2. Anterior antenna, female, ... × 253
Fig. 3. Anterior antenna, male, ... × 253
Fig. 4. Posterior antenna, ... × 506
Fig. 5. Mandible and palp, ... × 760
Fig. 6. Posterior footjaw, ... × 760
Fig. 7. Foot of first pair, ... × 336
Fig. 8. Foot of third pair, male, ... × 336

Fig. 9. Foot of fifth pair, female, ... × 336
Fig. 10. Foot of fifth pair, male, ... × 506
Fig. 11. Abdomen and caudal stylets, . . . × 126

Moraria anderson-smithi, T. and A. Scott.

Fig. 12. Adult female, dorsal view, . . . × 104
Fig. 13. Adult male, side view, ... × 104
Fig. 14. Anterior antenna, female, ... × 506
Fig. 15. Anterior antenna, male, ... × 506
Fig. 16. Posterior antenna, ... × 760
Fig. 17. Mandible and palp, ... × 760
Fig. 18. Maxilla, ... × 760
Fig. 19. Anterior footjaw, ... × 1000
Fig. 20. Posterior footjaw, ... × 1000
Fig. 21. Foot of first pair, ... × 760
Fig. 22. Foot of second pair, female, . . . × 760
Fig. 23. Foot of second pair—inner branch—male, . . × 1500
Fig. 24. Foot of fourth pair, ... × 760
Fig. 25. Foot of fifth pair, female, ... × 1000
Fig. 26. Foot of fifth pair, male, ... × 1000

Latona setifera (Müller).

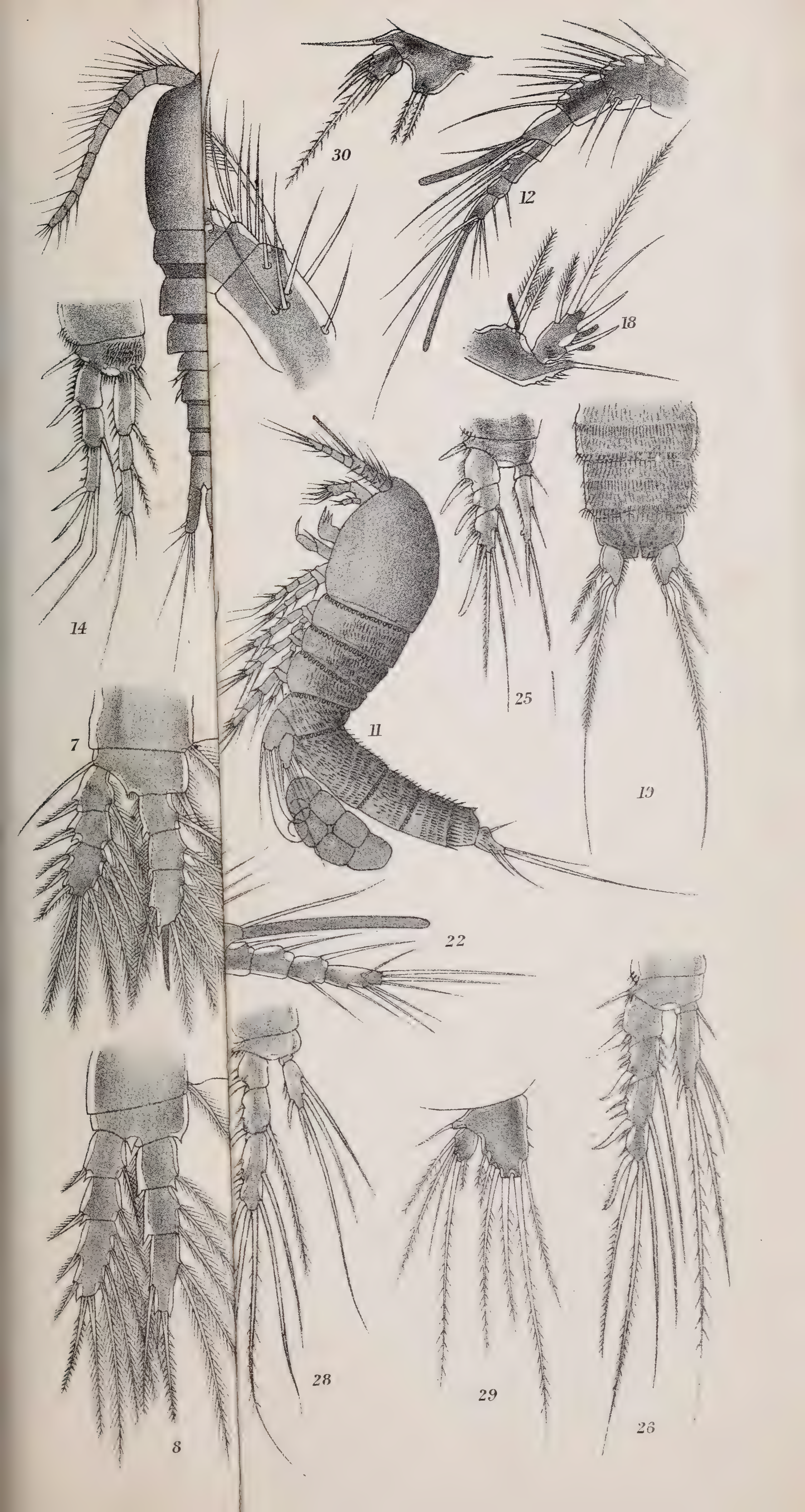
Fig. 27. Second antenna, ... × 80

Macrothrix laticornis (Jurine).

Fig. 28. Adult, side view, ... × 104
Fig. 29. Post-abdomen, ... × 190

Leptorhynchus falcatus (G. O. Sars).

Fig. 30. Adult female, side view, ... × 128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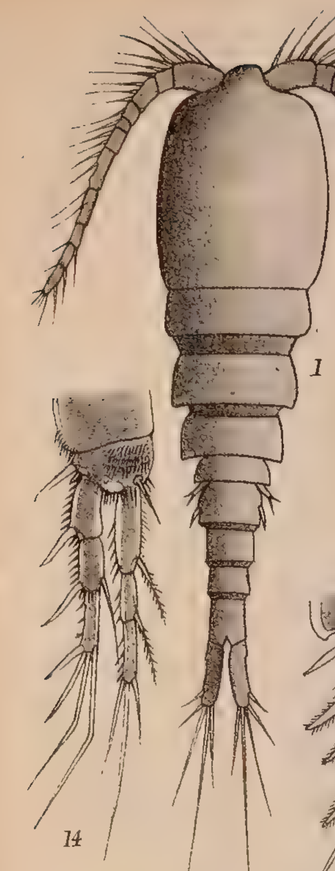
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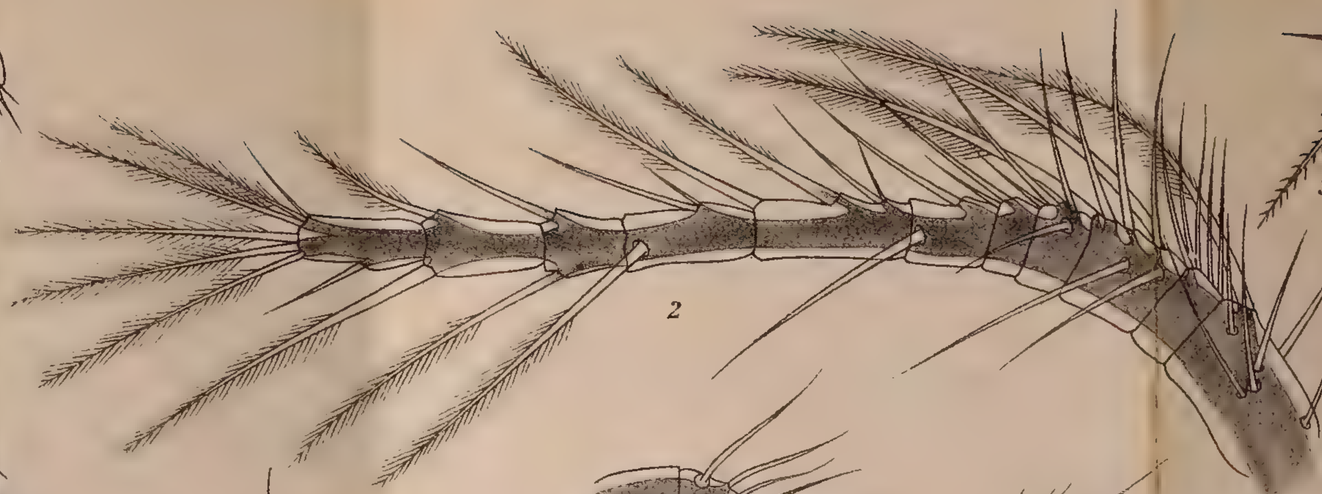
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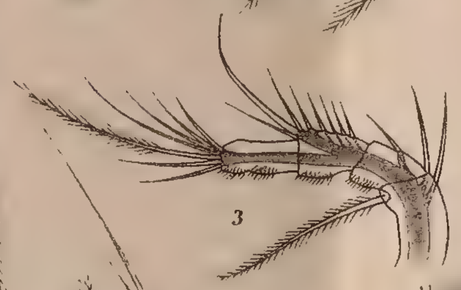
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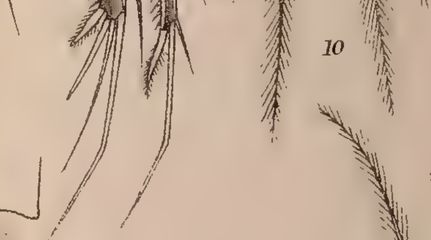
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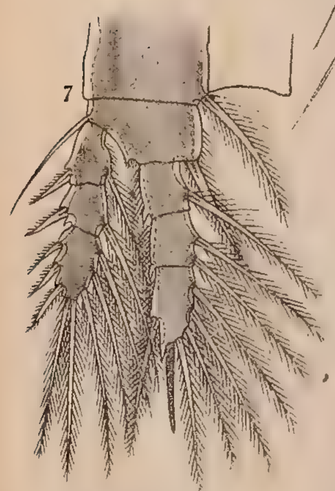
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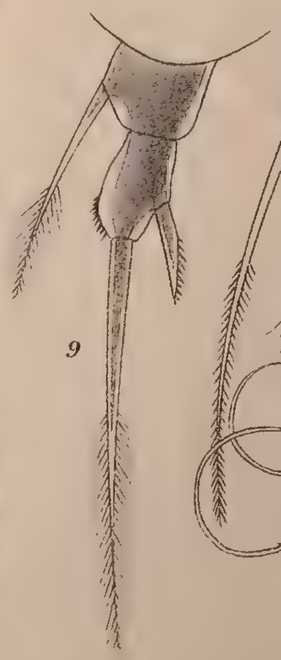
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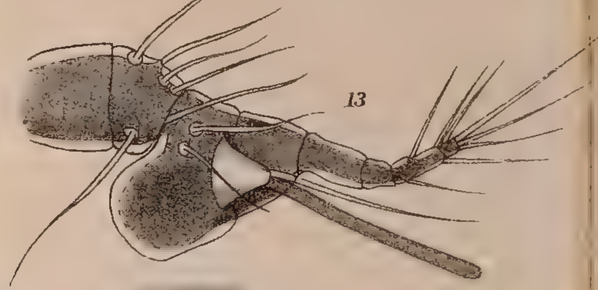
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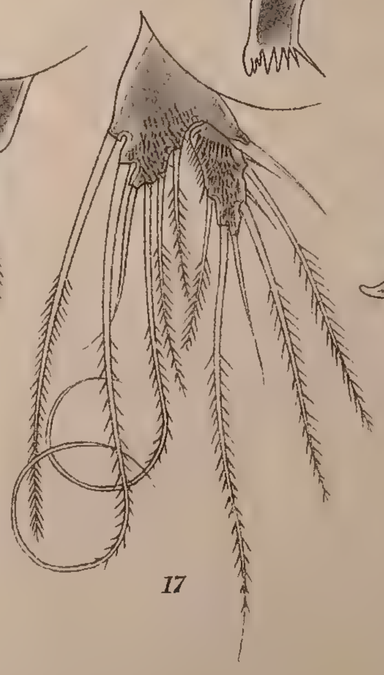
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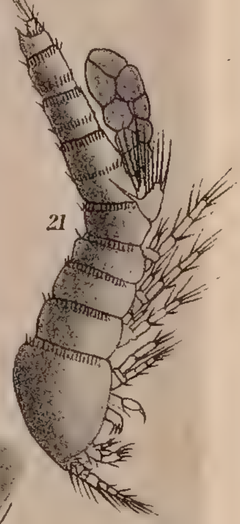
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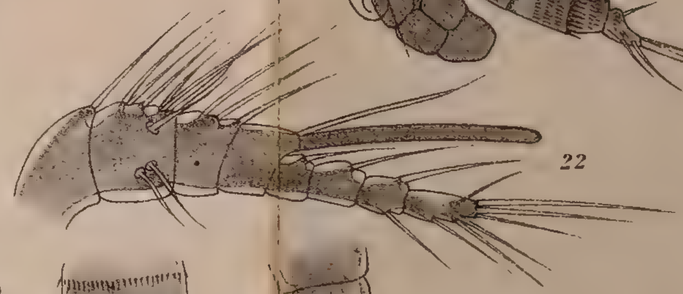
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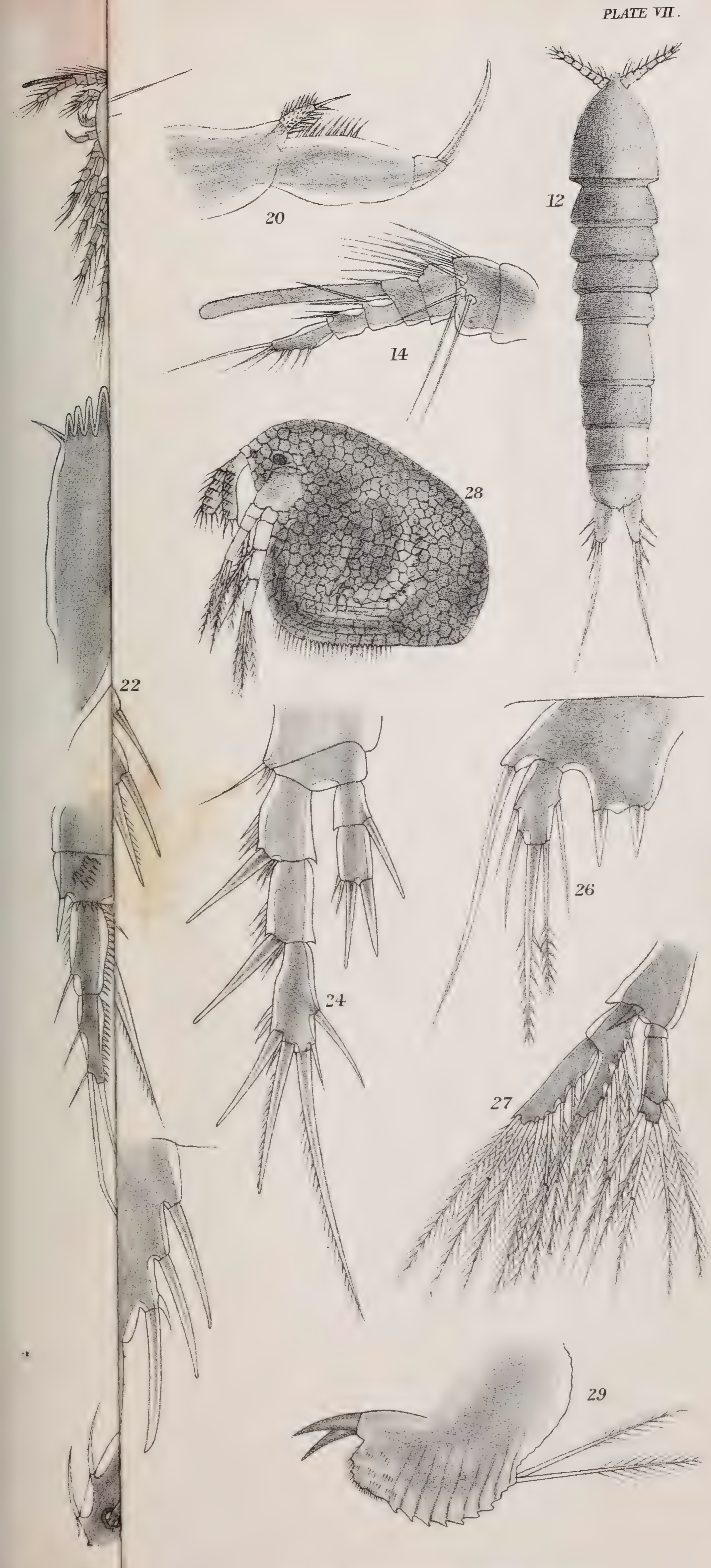
Figs. 1-10.—Cyclops ewarti *Brady*. Figs. 11-20.—Attheyella spinosa *Brady*. Figs. 21-31.—Attheyella cryptorum *Brady*.



ix laticornis (Jurine). Fig. 30.—Leptorhynchus falcatus (*G. O. Sars*).

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Figs. 1 11.—Attheyella propinqua, *n. sp.* Figs. 13 26.—Moraria anderson-smithi *T. and A. Scott*. Fig. 27.—Latona setifera (*Müller*). Figs. 28 29.—Macrothrix laticornis (Jurine). Fig. 30.—Leptorhynchus falcatus (*G. O. Sars*).

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