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### XXXIII.—Crustacea Copepoda new to Science from Devon and Cornwall

Canon A. M. Norman F.R.S. & Thomas Scott LL.D.,  
F.L.S.

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Of the new species described the types of only two are figured with sufficient clearness to be recognizable, and both these prove to be identical with quite common species. *Coluber fasciatus* of Rosén is based on a *Drymobius Boddaertii*, var. *Rappii*, Gthr., and the snake from Java named after Prof. Lilljeborg, and for which a new genus is proposed under the preoccupied name *Anisodon*, is a *Psammodynastes pulverulentus*. Probably many of the other determinations, if they were looked into by a competent herpetologist, would be found to be unreliable.

There is, however, one case in which the identification cannot be questioned, and that is the common *Chrysopelen ornata* figured on pl. xi. fig. 1. Of this snake I have examined the vertebrae in several specimens, in spirit or prepared as skeletons, and I cannot find more than a keel under the posterior precaudal vertebrae, which are figured by Mr. Rosén as with strongly developed hypapophyses (p. 171, fig. d). As this snake is quite common in collections, and the necessary examination can easily be made on a spirit-specimen, I would invite any reader who may be interested in this matter to verify my statement.

XXXIII.—*Crustacea Copepoda new to Science from Devon and Cornwall*. By Canon A. M. NORMAN, F.R.S., and THOMAS SCOTT, LL.D., F.L.S.

WE are preparing for publication a catalogue of the Crustacea of Devon and Cornwall. In that catalogue, while both authors are concerned in the whole, Dr. Scott will more especially undertake the part which relates to the free-living Copepoda, while the rest of the Crustacea will be chiefly treated of by Canon Norman. We have thought it desirable to publish the following preliminary descriptions of some new species of minute Copepoda. They were collected by Canon Norman during visits to the Devon and Cornish coasts in the years 1875, 1884, 1889, 1903, and 1904.

Genus *STENHELIA*, Boeck, 1864.

*Stenhelix pygmaea*, sp. n.

*Description of the female*.—Body moderately stout and tapering slightly towards the posterior end. The specimen from which the description is prepared was only 36 mm.

(about  $\frac{1}{70}$  of an inch) in length and carried a single moderately large ovisac; the forehead is produced into a small but distinct rostrum.

Antennules short, eight-jointed, first and second joints large, the fourth to the seventh very small; the third and last are subequal and also small, but rather larger than the intermediate joints, as in the formula—

Proportional lengths of the joints .....	20	20	9	4	3	3	4	11
Numbers of the joints from proximal end of antennule.	1	2	3	4	5	6	7	8

Outer ramus of posterior antennæ small and triarticulate. Mandible-palp moderately stout, with two small branches. Second maxillipeds not very robust, and armed with slender elongated terminal claws.

Inner branches of first pair of legs slender and considerably longer than the outer branches, the first joint only slightly longer than the last, while the middle joint is rather more than half the length of the first; the outer branches reach to near the end of the middle joint of the inner branches. Second, third, and fourth legs also slender; the outer branches of the fourth legs are only slightly longer than the inner. Fifth pair of legs small: primary joint broadly subtriangular, but with the apex truncated and bearing three setæ of nearly equal length and one about the same length as the others near the distal end of the inner margin. Secondary branch moderately narrow, subcylindrical, tapering slightly towards the distal extremity; breadth scarcely equal to half the length; apex slightly produced in the middle to form the base for a slender seta; a slender seta springs from near the distal end of the inner margin, and there are also about four setæ on the outer margin, the two lower ones being stouter than the others.

Purcell joints very short.

*Hab.* Dredged near Eddystone Lighthouse, Aug. 31st, 1901; apparently not common. No males observed.

The small size of the female, the peculiar structure of antennules, of the first pair of legs, and the form and armature of the last pair distinguish this from any other known to us. This species has recently been observed in dredged material from the Firth of Forth.

#### *Stenhelia simulans*, sp. n.

*Description of the female.*—The female of this species has a general resemblance to *Stenhelia ima*, G. S. Brady. Antennules eight-jointed, moderately stout, scarcely so elongated

as those of *S. ima*; the first four joints are together equal to about twice the entire length of the last four; first, second, and fourth joints subequal, but the second rather longer than the other two; third about half the length of the second and nearly equal to the last; the fifth, sixth, and seventh small, as shown in the formula—

Proportional lengths of the joints..	20	26	12	20	6	7	9	14
Numbers of the joints.....	1	2	3	4	5	6	7	8

Antennæ nearly as in *S. ima*; outer ramus small, tri-articulate.

Second maxillipeds moderately stout; second joint about twice as long as broad, having a series of minute bristles arranged horizontally on the lateral aspect and near the middle, and with a small but distinct seta on the inner margin and towards the distal end; terminal claw moderately slender.

First pair of natatory legs moderately slender; the outer branches reach to about the end of the first joint of the inner, and the exterior spines are slender and elongated; each of the three joints fringed with minute cilia on the outer margin; first and second joints with also a number of delicate cilia on the inner margin; inner branches have the first joint rather longer than the entire length of the second and third, while the end joint is fully twice the length of the middle one. The last pair are somewhat similar to those of *S. ima*, but the secondary joints are proportionally broader, being about half as broad as long; there is also a slight difference in the armature.

*Hab.* Dredged near Chequer Buoy in the neighbourhood of Plymouth, Aug. 14th, 1903; apparently not common.

The more important differences between the species just described and *S. ima*, which it resembles, are found in the proportional lengths of the joints of the antennules, the greater proportional length of the outer branches of the first pair of legs, and in the secondary joints of the fifth pair being proportionally broader.

*Stenhelia neglecta*, sp. n.

*Description of the female.*—This species is moderately slender and about .8 mm. in length. Rostrum moderately elongated and slender. The antennules resemble those of *Stenhelia ima* in length and number of joints, but the lengths of the joints differ as shown by the formula—

Proportional lengths of the joints..	11	8	6	10	2	4	3	7
Numbers of the joints .....	1	2	3	4	5	6	7	8

Outer ramus of the antennæ small and apparently triarticulate, but the middle articulation is minute and somewhat indistinct.

First pair of legs slender; inner branches moderately elongated; first joint about as long as the entire outer branch, while the second and third are about half the length of the first, the middle joint being very small. The next three pairs are also slender and elongated; the inner branches of the fourth pair, which are somewhat shorter than the outer, are provided with a moderately long plumose seta near the middle of the inner margin of each of the three joints, two similar setæ and a small spine spring from the apex of the last joint. The fifth pair are of moderate size; inner portion of primary joint narrow, subtriangular, and provided with a seta and two moderately stout spines on the inner margin and two setæ at the apex; the secondary joint, which is rather narrow, subcylindrical for about three fourths of its length, then tapering obliquely to the pointed extremity, extends considerably beyond the end of the primary branch, and is furnished with two setæ on the distal half of the inner margin, two on the outer margin, and one at the apex.

Furcal joints very short.

*Hab.* Dredged at Salcombe in 1875, and in Mill Bay, Plymouth, among algæ, in August 1903.

This may be distinguished from other described species by the structure of the slender first pair of natatory legs and the peculiar form of the female fifth pair.

*Stenhelia varians*, sp. n.

In this species the female closely resembles *Stenhelia neglecta*, just described, but differs in the following more or less important particulars:—The first four joints of the eight-jointed antennules are together nearly three times the entire length of the last four; the second joint is the longest and is more than twice the length of the third, while the fourth is about one and a half times longer than the same joint; the next three joints are very small and subequal, but the end joint is about as long as the combined lengths of the two preceding ones, as indicated by the formula—

Proportional lengths of the joints..	8	17	8	12	3	4	4	7
Numbers of the joints.....	1	2	3	4	5	6	7	8

The outer rami of the second antennæ are triarticulate, the middle joint being the smallest. The mouth-organs and natatory legs are similar to those of *S. neglecta*. The fifth

pair also resemble in some respects those of the species referred to, but differ somewhat in form and armature; the primary joints terminate in a narrower apex, and on the inner margin there are short and subequal setæ and two slender terminal setæ of unequal length; the space that separates this pair of setæ from the nearest of the other three is distinctly wider than that which separates these three from one another; the secondary joints are subovate and nearly twice as long as broad; the outside edge is nearly straight, but the inner is broadly convex; a seta springs from near the middle of the outer margin and four from the angularly rounded extremity of the joint.

Furcal joints short.

*Hab.* Dredged outside the harbour at Fowey, Cornwall, May 12th, 1903; not common. No males were observed.

*Stenhelia longirostris*, sp. n.

The form we describe under this name was dredged at Salcombe in 1875. It is not unlike *S. reflexa*, T. Scott, in its general appearance and in the structure of some of its appendages; it is, however, a smaller species, the specimen from which the description was prepared measured about .88 mm. ( $\frac{1}{8}$  of an inch) in length. Body subcylindrical, with the forehead produced into an elongated and rather slender rostrum. The first joint of the eight-jointed antennules in the female is slightly longer than the second and nearly twice as long as the third joint; the fourth, which is also rather longer than the third, has the upper distal angle produced forward to near the end of the following joint to form the base of a long sensory filament; the fifth, sixth, and seventh joints are small and nearly equal in length, while the last is about twice the length of the preceding one. The formula shows approximately the proportional lengths of all the joints—

Proportional lengths of the joints..	13	11	7	9	3	3	3	5
Numbers of the joints.....	1	2	3	4	5	6	7	8

The three-jointed outer ramus of the second antennæ is of moderate length.

The first joint of the second maxillipeds bears two moderately long setæ on the inner aspect of the distal end; second joint narrow, subcylindrical, and furnished with a longitudinal row of spinules on its inner aspect, and a small seta near the middle and another near the end of the inner margin; terminal claw slender and moderately elongated. In the

first pair of natatory legs the proximal joint of the inner branches is about equal to the entire length of the outer, but the second joint is only about half the length of the third, while the second and third joints are together about equal to two thirds the length of the proximal joint; the joints of the outer branches are subequal. The next three pairs are similar to those in *Stenhelix reflexa*.

The fifth pair has the inner portion of the primary joint produced into a narrow subtriangular plate, the bluntly rounded apex of which reaches to about the middle of the secondary joint; there are three setae on the inner margin, the upper two are short and subequal, the lower moderately elongated; there are also two slender and moderately long apical setae of unequal length. The secondary joint is moderately narrow and elongated, the breadth being scarcely half the length; it is broadest near the proximal end and tapers gradually to the truncate and somewhat angular apex; a small seta springs from near the distal end of the inner margin, two of moderate length from the truncate apex, and three small ones from the lower half of the outer margin; that one of these three which is nearest the distal end is the smallest and is provided with a peculiarly thickened base.

No males of this species have been observed. The peculiar form and armature of the fifth pair of thoracic feet appear to be characteristic of the species.

The furcal joints in this species are short.

GENUS PARASTENHELIX, I. C. Thompson & A. Scott, 1903.

*Parastenhelia anglica*, sp. n.

The genus *Parastenhelia* was instituted by I. C. Thompson and Andrew Scott for two species which, though having a close resemblance to *Stenhelix*, differ in possessing nine-jointed antennules, in the middle joint of the outer ramus of the antennae being nearly as long as the joint on either side, and in having the inner branches of the first natatory legs two-jointed, the first joint being considerably longer than the three-jointed outer branches. The form I have now to describe agrees so closely with the typical species that I have little hesitation in ascribing it to the same genus, even though the inner branches of the first pair of legs be apparently three-jointed. In this form the antennules are composed of nine joints; the first four are together equal to fully twice the entire length of the other five, the second is considerably



longer than the third or fourth, which are subequal; all the other joints are smaller, as shown by the formula—

Proportional lengths of the joints.	25	40	34	34	12	10	8	6	16
Numbers of the joints .....	1	2	3	4	5	6	7	8	9

The outer ramus of the second antennæ is three-jointed and moderately elongated, the middle joint being about as long as the end one.

The mandibles resemble those of *Stenhelia*; the basal joint of the mandible-palp becomes broader towards the distal end and is furnished with two uniarticulate branches, the distal one being more elongated than the other. The second maxillipeds resemble those of *Stenhelia hispida*, G. S. Brady.

The first thoracic legs have the inner branches very long and slender and apparently three-jointed; the first joint is about half the length of the second, but the end one is very short; a plumose seta springs from the inner distal angle of the first joint, while the end joint bears two claw-like terminal spines of unequal length; the outer branches reach to about the middle of the inner ones. The second, third, and fourth pairs are slender and moderately elongated; in the outer branches of the fourth pair the first and second joints bear exteriorly a small spine near the distal end and a plumose seta on the inner margin, while the end joint is furnished with two terminal spines—one small and one long and slender—and a moderately long seta; the first two joints of the inner branches are each furnished with a seta on the inner margin, while two setæ spring from the inner margin of the third joint, which also bears two setæ and a small spine at the apex. The fifth pair has a small primary joint, subtriangular in form and provided with five setæ on the lower half of the inner margin and apex. The secondary joint is elongated, the upper portion is subcylindrical, the greatest breadth being equal to about a third of the entire length; at about a third from the distal end the outer margin slopes gradually inwards till it meets the nearly straight inner margin; a single short seta springs from near the lower end of the inner margin and five from the distal third of the outer margin, the apical and middle setæ being elongated, but the other three moderately short.

Furcal joints very short.

*Hab.* Dredged outside of Fowey Harbour, Cornwall, on May 9th, 1903; rare. No males were observed.

Genus AMEIRA, Boeck, 1864.

*Ameira simplex*, sp. n.

*Description of the female.*—Body moderately slender; rostrum somewhat prominent; length  $6\frac{1}{10}$  mm. ( $\frac{1}{10}$  of an inch).

Antennules short, moderately stout, eight-jointed, first and second joints longer and somewhat more robust than the others, third to the sixth short and subequal; the last two are also small, as shown by the formula—

Proportional lengths of the joints..	15	15	9	8	6	7	3	5
Numbers of the joints.....	1	2	3	4	5	6	7	8

Antennæ small, outer ramus short and uniaarticulate and provided with a few terminal setæ. Mandibles also small, mandible-palp simple and one-branched.

Inner branches of first natatory legs elongated and slender; first and third joints nearly equal in length, second about half as long as the first; the outer reach nearly to the end of the second joint of the inner branches. The other three pairs are also moderately slender, and the outer branches are rather longer than the inner ones.

Fifth pair small, inner portion of primary joint subcylindrical, with the apex obliquely truncated and bearing five setæ, the second seta from the outside being much longer than the others. Secondary joint subovate, length nearly twice the width at the proximal end, the outer and inner margins are only slightly rounded and taper gently towards the narrowly rounded apex; they are each furnished with five setæ, four (three elongated and one—the second from the outside—small) are carried on the rounded apex, and a small one on the proximal half of the outer margin.

The furcal joints are fully half as long as the last abdominal segment.

*Hab.* Dredged in the estuary of the Exe, near Starcross, June 9th, 1884; apparently rare. No males observed.

This species bears a close resemblance to *Ameira exigua*, T. Scott, but it differs to some extent in the proportional lengths of the joints of the antennules, in the armature of the mandible-palp, in the outer branches of the first thoracic feet being as long as first and second joints of the inner branches, as well as in the joints of the inner branches being different in their proportional lengths; the armature of the fifth pair is also different in the two species.

Genus *LAOPHONTINA*, nov.

Somewhat like *Laophonte* in general appearance. Anterior antennæ short and composed of about six joints. Outer ramus of posterior antennæ uniarticulate. First pair of natatory legs nearly as in *Laophonte*. Second and third pairs one-branched and more or less rudimentary. Fourth pair two-branched, outer branches three-, inner one-jointed. Fifth pair as in *Laophonte*. Only one species is known, which is described below.

*Laophontina dubia*, sp. n.

Length of female about .5 mm., male rather smaller. Body somewhat slender. Antennules of the female short, six-jointed; first joint stout, longer than any of the others, and with a small tooth-like process near the middle of the exterior margin and another at the inner distal angle; second joint shorter than the first and armed exteriorly with a strong projecting tooth; third rather longer, but less robust than the second; fourth and fifth very small; the last joint is longer than the fourth and fifth combined.

The male antennules are modified for grasping, but the first and second joints are similar to those of the female.

Posterior antennæ moderately slender, outer ramus small and uniarticulate.

First thoracic feet as in *Laophonte*; inner branches elongated, two-jointed; first joint long and slender, the other short and armed with a long stout terminal claw; inner branches very small and uniarticulate and furnished with a few small setæ. Second pair rudimentary, one-branched, each composed of a single short but moderately stout joint, bearing a few small setæ. Third pair also rudimentary and one-branched, but the branch is two-jointed and bears two spiniform terminal setæ. Fourth pair two-branched; outer branch short, stout, and three-jointed; the first and second joints bear moderately long and stout spine-like setæ on their outer margins; the end joint is very small and bears two apical setæ, one long, the other shorter and spiniform; inner branch small and uniarticulate and furnished with elongated setæ. The fourth pair in the male are smaller than in the female and the inner branches are nearly obsolete.

The fifth pair in the female moderately large and foliaceous; primary joints broadly triangular and provided with about four plumose setæ, one at the apex and three on the inner margin; secondary joints ovate, the length being equal to

about twice the breadth; they are each provided with four plumose terminal setæ.

In the male the fifth pair are very small and rudimentary.

Furcal joints slender and about equal in length to the last abdominal segment; principal tail-setæ somewhat dilated at the base.

*Hab.* Dredged at St. Mary's, Scilly Islands, in May 1903.

Genus DACTYLOPUSIA, A. M. Norman, 1903 \*.

*Dactylopusia valida*, sp. n.

This species resembles *Dactylopusia tisboides* (Claus) in its general appearance and size. The eight-jointed antennules are short and stout; the first and second joints are longer and the fifth and seventh shorter than the others; the other four, which are nearly of equal length, are each about a third shorter than the first or second, as shown by the formula—

Proportional lengths of the joints..	13	11	7	8	5	8	5	8
Numbers of the joints.....	1	2	3	4	5	6	7	8

The three-jointed outer ramus of the posterior antennæ is moderately large and stout and provided with several setæ. The mouth-organs resemble those of *D. tisboides*, but the second maxillipeds are moderately stout and their terminal claws elongated and slender.

The first pair of swimming-feet are moderately stout; the outer branches are rather more than half the length of the inner and armed exteriorly with strong spines; the first and second joints are very robust, their width being about equal to three fourths of the length; the end joint is very short and furnished with four spines and a seta; the spines are of unequal length, the two outer being very small, the other two strong and slightly clawed, the inner being the longer; the inner branches are also moderately stout, the first joint elongated, the second and third very short, and the third armed with one long and one short and stout terminal claw. The second, third, and fourth pairs resemble the same three pairs in *D. tisboides*.

In the fifth pair the primary joints are moderately elongated and reach to about the extremity of the secondary joints; they taper slightly to the rounded distal end, which

\* Cf. Ann. & Mag. Nat. Hist., April 1903. Norman, on change of names.

carries five setæ; the setæ are arranged in three groups—the two outer are close together, so also are the next two, but there is a moderately wide space between the two pairs of setæ and also between the inner pair and the last seta situated a small distance up on the inner edge; in the space between the outer and inner pairs there appears to be a small spine. The secondary joints are broadly ovate, the length being scarcely twice the width at the broadest part; the inner margin is nearly straight, but the outer is moderately convex; a small seta springs from the middle and an elongated one from near the distal end of the inner margin, while other five are arranged round the lower half of the outer margin and apex.

The furcal joints are very short.

*Hab.* Dredged near Beggar's Island, Plymouth, in 1889; apparently not very common.

This species is readily distinguished by the robust form and structure of the first pair of natatory legs, the stout eight-jointed antennules, and the form and armature of the fifth feet.

*Dactylopusia ornata*, sp. n.

*Description of the female.*—Body moderately robust; length .62 mm. ( $\frac{1}{16}$  of an inch).

Antennules short, moderately stout, and composed of six subequal joints. Outer ramus of posterior antennæ apparently only two-jointed. Mouth-organs as in *D. rostratus*, T. Scott.

The first thoracic legs are short and stout; the three-jointed outer branches are rather shorter than the first joint of the inner ones; the first two joints have the outer margin fringed with short setæ, and a setiferous spine springs from their outer distal angles; the second joint bears also a plumose seta on its inner margin; the end joint is small and bears several spiniform apical setæ. The inner branches appear to be only two-jointed; the first is stout and elongated, and bears a long plumose seta on its inner margin; the end joint is short and probably composed of two coalescent joints, it is furnished with a stout and slightly curved claw-like terminal spine. The next three pairs resemble those in *D. rostrata* (T. Scott).

The fifth pair are broadly lamelliform; the primary joint bears interiorly five setæ of unequal lengths on the broadly rounded distal edge; the secondary joint is subquadrangular and carries five stout setæ, one being near the distal end of

the outer margin, three on the truncated apex, and one on the inner margin.

The furcal joints are very short.

The male does not differ greatly from the female except in the following particulars:—the antennules are modified for grasping, the outer branches of the second thoracic feet are armed with stronger spines than the same pair in the female, and the inner branches are only two-jointed, and the terminal spine is stout and claw-like.

The fifth pair are rather smaller than those of the female, and the inner and broadly rounded portion of the basal joint bears only two apical spines.

*Hab.* Dredged at various places on the coast of Devon; moderately frequent. Also at Fowey, Cornwall, and New Grimsby Harbour, Scilly Islands.

Recently collected specimens were easily recognized by their peculiar colour, which was for the most part of a uniform yellow or, in some examples, yellowish grey; but what rendered the specimens so conspicuous was a band of a fine purple colour which adorned the posterior portion of the cephalic segment; this band, which covers about a third of the segment, does not extend right across, but terminates on each side a short distance from the lateral margins; moreover, the posterior edge of the band is even and coincides with the edge of the cephalic segment, but the anterior edge is deeply crenulated. Immersion in methylated spirit speedily destroys the purple colour, but the colour remains intact for a considerable time if specimens be preserved in formalin.

*Dactylopusia purpurcincta*, sp. n.

In this species the body is depressed, but moderately stout, and in general appearance resembles *D. flava*, Claus; length about .5 mm.

Seen from above the cephalothoracic segment is broadly and evenly rounded in front and about as long as the remaining segments of the thorax; the three segments immediately posterior to that of the cephalothorax are of a dark purplish-brown colour, but the ground-colour of the body is light yellowish.

The antennules are short and stout and appear to be composed of seven joints; the first and second, which are robust, are longer than the others. The formula shows approximately the proportional lengths of the various joints—

Proportional lengths of the joints..	14	13	8	8	5	3	7
Numbers of the joints.....	1	2	3	4	5	6	7

Antennæ stout, outer rami slender, of moderate length, and apparently only two-jointed.

The first pair of swimming-feet short and robust; outer branches considerably shorter than the inner and furnished with long, spiniform, coarsely plumose setæ on the outer margin; inner branches apparently only two-jointed, the first joint longer than the entire outer branches and strongly dilated interiorly, as in the male of *D. flava*, second and third joints coalescent and bearing a short stout terminal claw and a moderately long spiniform seta. The next three pairs are somewhat similar to those of *D. tiboides*.

The fifth feet are moderately large; primary joint a broadly quadrangular lamelliform plate bearing five strong, plumose, spiniform setæ on the distal margin, which is broadly truncate; a comparatively wide space separates the outermost seta from the one next to it. Secondary joint subcylindrical, but becoming narrower from about the middle of the joint to the end; inner margin nearly straight, with a short seta on the lower half; two stout spine-like setæ spring from the lower half of the outer margin and two from the apex.

Furcal joints very short.

Male unknown.

*Hab.* Dredged at Salcombe, June 30th, 1875.

This form closely resembles *D. laticaudata* and *D. æmula*, described by I. C. Thompson and A. Scott in their Report on the Copepoda collected by Professor Herdman at Ceylon in 1902. The two species, with that just described, differ in some respects from the typical *Dactylopusia*, and, as suggested by the authors referred to, "may some time require a separate genus." The coloured band in this species appeared to be quite unaffected by the long immersion in methylated spirit, forming a marked contrast to the evanescent colour of *D. ornata*.

#### Genus PELTIDIUM, Philippi, 1839.

##### *Peltidium conspicuum*, sp. n.

A single specimen of an apparently undescribed *Peltidium* was obtained in New Grimsby Harbour, Scilly Islands, May 23rd, 1903. It was of a uniform dark purple or ruby colour, and therefore conspicuous in the sample in which it occurred.

*P. conspicuum* has a general resemblance to *P. purpurcum*, Philippi, but is rather larger, and the carapace wants the pellucid areas so characteristic of that species, being, on the

contrary, of a dense uniform purple or ruby colour. It measures about 1.3 mm. ( $\frac{1}{15}$  of an inch) in length. The rostrum truncated, not much produced, the truncated end being obscurely tridentate.

Antennules short, stout, and six-jointed; first three joints subequal and about twice the entire length of the last three, the penultimate joint being very small; antennæ and mouth-organs as in *P. purpureum*.

The first pair of swimming-feet resemble those of the same species, but the first and second joints of the outer branches are of nearly equal length; they each bear a short seta near the middle of the outer margin and a similar seta near the distal end of the inner margin; the end joint is very short and furnished with three claws (two stout and of moderate length and one short) and a small seta. The inner branches are stout and composed of two joints; a seta springs from the distal end of the inner margins of the first and second joints, but the second joint is also furnished with two apical setæ. The second, third, and fourth pairs are apparently similar to those of *P. purpureum*. In the fifth pair the primary joint appears to be short and bears one seta on the outside and two on the inside distal angles; the second joint is also short and provided with six stout plumose setæ on the lower half of the outer margin and apex.

The first segment of the abdomen forms a trilobed plate which entirely overlaps the remaining abdominal segments and furcal joints, and in this respect differs very markedly from other described species; in these the last abdominal segment and furcal joints are exposed.

#### Genus MESOCHERES, nov.

Body somewhat similar in general appearance to *Scottocheres*, Giesb., the cephalothorax seen from above being ovate in outline, while the abdomen is narrow and elongated. The antennules are composed of twenty-one joints and are similar in structure to those of *Asterocheres*. The antennæ also resemble those in the same genus. The mandibles and maxillæ were damaged and could not be satisfactorily made out. The first maxillipeds are small but moderately stout, their terminal claws elongated and strongly hooked and with an elongated spine attached near the base of the claw. Second maxillipeds long and slender, and similar in structure to the same appendages in *Asterocheres*. First four pairs of swimming-feet somewhat similar to those of the same genus. Fifth pair very small and apparently two-jointed.



This genus partakes of the characters of the two genera *Asterocheres* and *Scottocheres*, but differs from both as described above.

*Mesocheres anglicus*, sp. n.

Cephalothorax of the female ovate, moderately robust, widest in the middle, the width being equal to fully half the length; first segment about one and a half times longer than the other segments combined: abdomen narrow and elongated, as in *Scottocheres longifurca*, Giesb., and composed of three segments, the first rather longer than the second and third together; it is widest at the proximal end and produced on each side into a hook-like process, as in the *Scottocheres* referred to; the anal segment is the smallest of the three, being only a little more than half the length of the preceding one. The furcal joints are long and slender and about four times as long as the last segment of the abdomen; the outer edge of each joint is fringed with minute bristles, and the principal apical setæ are only moderately elongated. Length about .65 mm. ( $\frac{1}{3\frac{1}{8}}$  of an inch).

Antennules composed of twenty-one joints and somewhat similar in structure to those of *Asterocheres Boeckii*; a moderately stout sensory filament springs from the end of the eighteenth joint. Antennæ three-jointed, the first joint longer than the next two together, the third small and furnished with one long and two short apical setæ; outer ramus small, unarticulate, with one or two slender apical setæ.

First maxillipeds short, armed with elongated, stout, strongly curved terminal claws; a moderately long spiniform seta springs from near the base of the claw. Second maxillipeds long, slender, and similar to the same appendages in *Asterocheres Boeckii*.

First four pairs of swimming-feet somewhat similar to those of the same species, but the armature differs to some extent, and especially that of the fourth pair; in this pair the spines on the outer margin and apex of the outer branches are large and broadly dagger-shaped, and they are all, with the exception of the inner terminal spine, finely serrated on both edges, but the inner terminal spine is only serrated on the outer edge; the first and second joints are also provided with a plumose seta on the inner margin, while the last joint bears four plumose setæ on the inner margin in addition to the four large spines on the outer margin and apex. The first joint of the inner branches bears one seta and the second and third joints two setæ on the inner margin; a similar seta

springs from a notch near the middle of the outer margin of the third joint, which is also armed with a large dagger-shaped terminal spine. The fifth pair are very small; the primary joint is nearly twice as broad as it is long and bears a single spiniform seta on the exterior distal angle; the secondary joint is indistinctly trilobed and carries two or three setæ.

*Hab.* Dredged in Plymouth Sound on August 12th, 1903.

Genus HERRMANNELLA, Canu, 1891.

*Herrmannella parva*, sp. n.

*Description of the female.*—Similar in general appearance to *H. rostrata*, Canu, but smaller; length of the specimen described .68 mm. ( $\frac{1}{37}$  of an inch).

Antennules short and composed of seven joints, the proportional lengths of which are given in the formula—

Proportional lengths of the joints..	14	.84	.8	.19	.19	.14	.8
Numbers of the joints.....	1	2	3	4	5	6	7

Antennæ stout, four-jointed, but the penultimate joint is very small; terminal setæ curved, claw-like, and exhibiting a pseudo-articulation near the middle, as in some species of the Lichomolgidae.

Mandibles in the form of broad falciform plates, which taper gradually to the acuminate apex. Maxillæ subcylindrical, simple in structure, and bearing each a small marginal and apical seta. First maxillipeds short, stout, and armed with a slender, curved, terminal appendage, bearing a unilateral row of small spinules, while a moderately long spiniform seta springs from the inner margin and near the base of the curved terminal appendage. The second maxillipeds are moderately stout, two-jointed, and provided with a stout terminal claw, as in *Lichomolgus liber*, Brady and Robertson.

The thoracic feet are somewhat similar to those of *Herrmannella rostrata*, Canu, but are scarcely so stout; both branches of the fourth pair are three-jointed; the first and second joints of the outer branches have each a small dagger-shaped spino at the distal end of the exterior margin, while the third joint has a similar spine in the middle of the outer margin and two apical spines, the inner one being about as long as the joint from which it springs; moreover, the second joint bears one long plumose seta and the third five similar setæ on the inner margin; the first and second joints of the inner branches have each a single seta near the distal end of

the inner margin, while the third joint bears only two terminal spines, the inner one stout and about twice as long as the other. Fifth pair very small; each foot consists of a single joint which bears two small terminal setæ.

The abdomen is moderately slender and composed of four segments; the genital segment is somewhat dilated and about equal in length to next three segments taken together; the second and third segments are small, while the fourth is rather longer than the preceding one.

The furcal joints are about twice as long as the last abdominal segment; each joint is furnished with several terminal setæ, and a single small bristle springs from near the middle of the outer edge.

*Hab.* Taken in Plymouth Sound, among Hydrozoa &c., near low-water, in August 1903; rare.

This small species resembles a diminutive *Pseudanthessius gracilis*, but the structure of the fourth pair of thoracic legs shows that its relationship is with Canu's genus *Herrmannella*. It differs, however, from any *Herrmannella* hitherto described by the form of the mandibles, the proportional lengths of the abdominal and furcal joints, and one or two other points mentioned in the description.

XXXIV.—*Descriptions of Two new Cyprinid Fishes from Tibet.* By C. TATE REGAN, B.A.

*Gymnocypris Waddellii.*

Pharyngeal teeth 4:3—3:4, cylindrical, obtusely pointed, slightly incurved. Depth of body about 5 in the length, length of head about 4. Breadth of head about  $1\frac{3}{4}$  in its length, diameter of eye 6–8, length of snout  $3\frac{1}{2}$ – $3\frac{2}{3}$ , inter-orbital width 3– $3\frac{1}{2}$ . Snout obtuse; mouth terminal, oblique; anterior edge of upper jaw not below the level of the lower margin of eye; maxillary nearly reaching the vertical from the anterior margin of eye. 10–13 gill-rakers on the lower part of the anterior arch, 2 or 3 on the upper part. Dorsal III 8, its origin a little nearer to tip of snout than to base of caudal; third simple ray slender and articulated above, slightly thickened and finely serrated in its basal half (in the two smaller examples), or not serrated (in the two larger ones). Anal III 5, extending to the base of caudal when laid back. Origin of ventral below about the middle of dorsal.