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5. Zoological Results of the Third Tanganyika Expedition, conducted by Dr. W. A. Cunnington, F.Z.S., 1904-1905.—Report on the Ostracoda. By Prof. G. O. SARS, C.M.Z.S.

[Received February 21, 1910.]

(Plates LXIV.-LXXIII.*)

Introduction.

In a paper published in the Society's 'Proceedings' (1909, p. 31), I have given an account of the Copepoda found in the samples taken by Dr. Cunnington, during the Third Tanganyika Expedition, from the three large Central African lakes, and I mentioned in this paper that a number of Ostracoda also occurred in the samples, some of the species having already been observed by Dr. Cunnington, and separated by him in small tubes. I have now examined the material more closely, and give in the present paper an account of the species accompanied by carefully drawn figures of all of them. The number of species determined amounts to no less than 29 in all, belonging to 7 different genera. Only two of these species I have been enabled to identify with previously described forms; all the others seem to be new to science. In the following pages I give short descriptions of all the species, with remarks on affinity and occurrence, and at the close of the paper some general remarks are added.

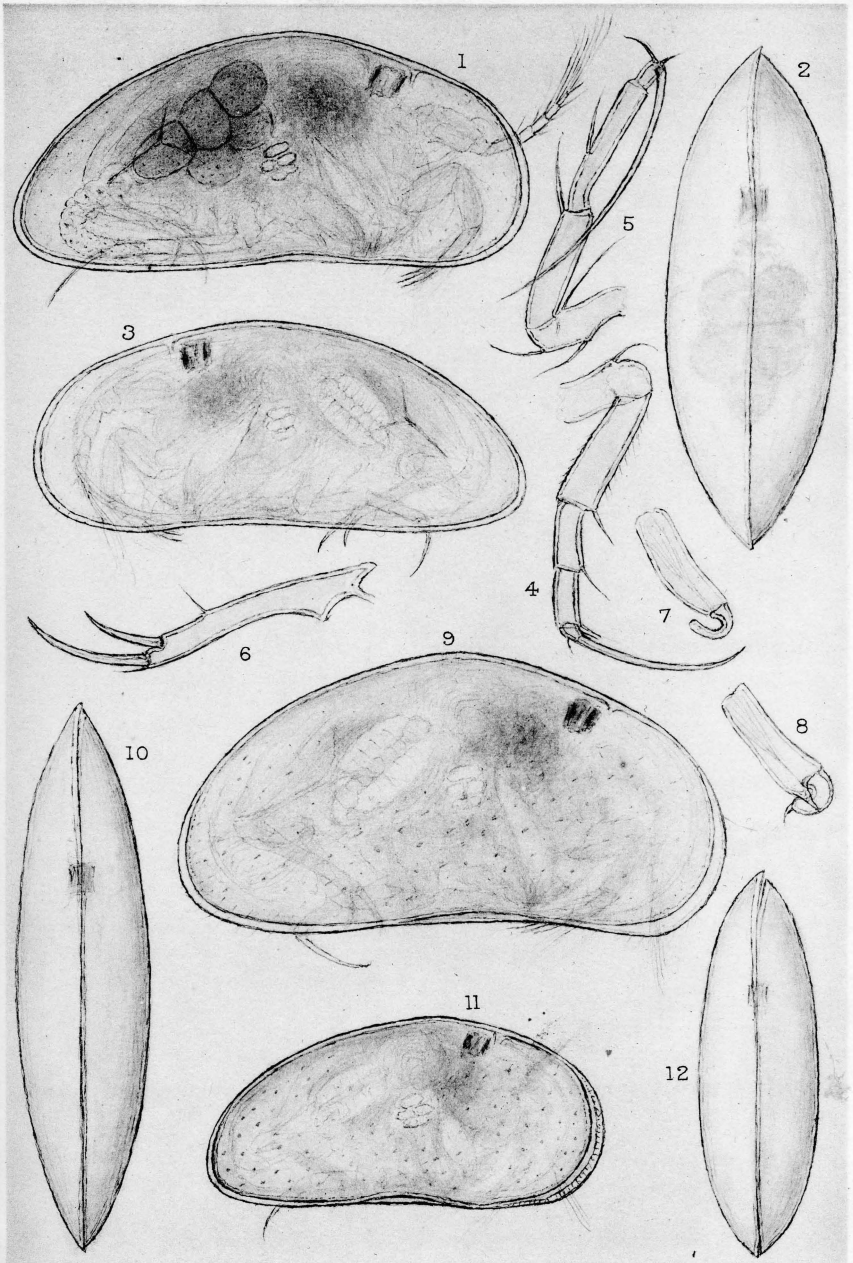
Description of the Species.

Family CYPRIIDÆ.

Genus I. PARACYPRIA, gen. n.

Generic Characters.—Shell compressed, of various form in the different species, in some cases approaching that in *Cypria*, in other cases very different, being, as a rule, very thin and pellucid, so as to allow the enclosed animal to be rather distinctly traced through its walls. Valves more or less unequal, the right one being the smaller and in some cases conspicuously overlapped by the left both in front and behind. Surface of shell more generally smooth and only very sparingly hairy at each extremity. Limbs on the whole built upon the same type as in *Cypria* (see the detail-figures given on Pl. LXV. of one of the species): Caudal rami comparatively short and more or less curved, tapering distally, dorsal edge smooth; terminal claws of moderate size; dorsal seta generally well developed, apical seta very small. Inferior antennæ of male with the third joint distinctly subdivided. Copulatory appendages each terminating in a beak-like extremity consisting of two jaws, one of which is mobile.

* For explanation of the Plates see p. 757.



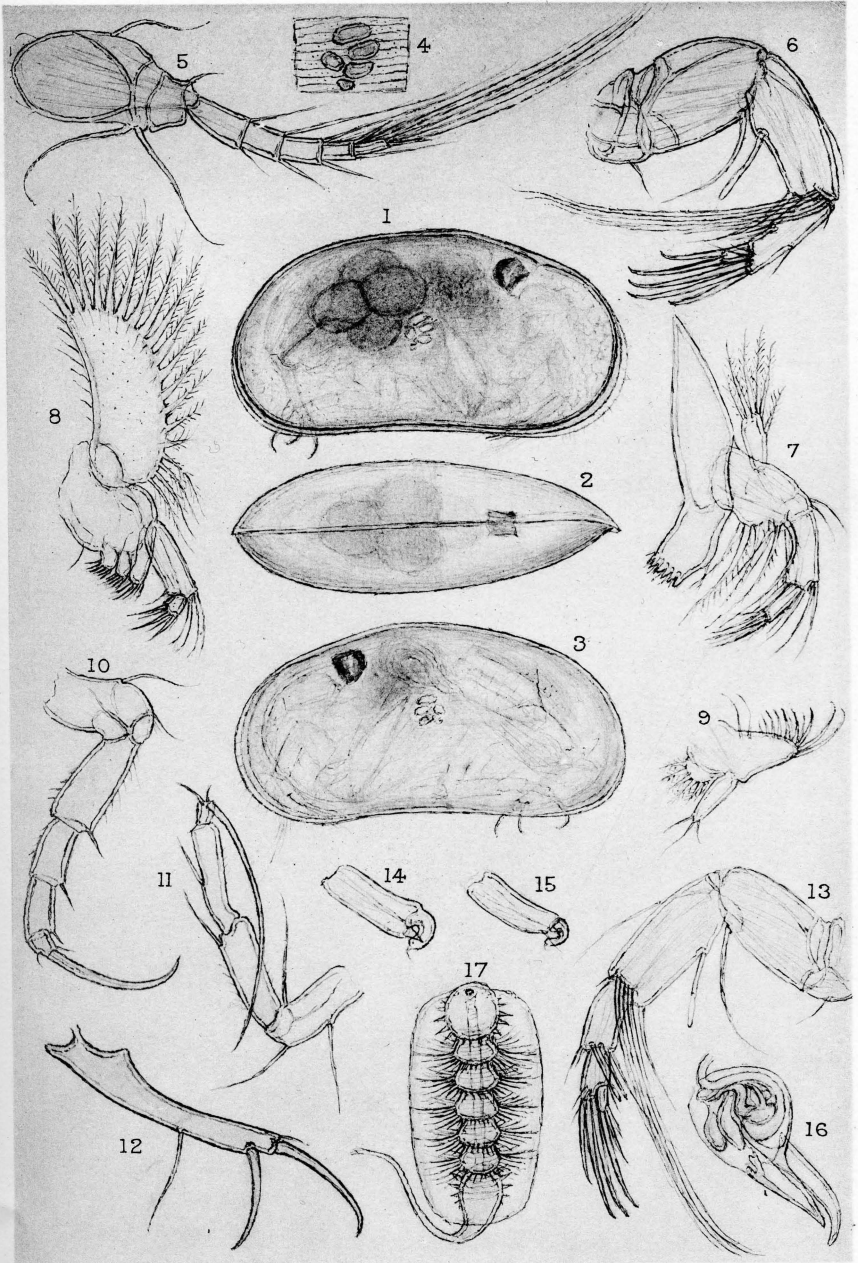
G.O.Sars

London Stereoscopic Co. Imp.

1-8. *PARACYPRIA DECLIVIS* G.O.SARS.

9-10. *P. COMPLANATA* G.O.SARS.

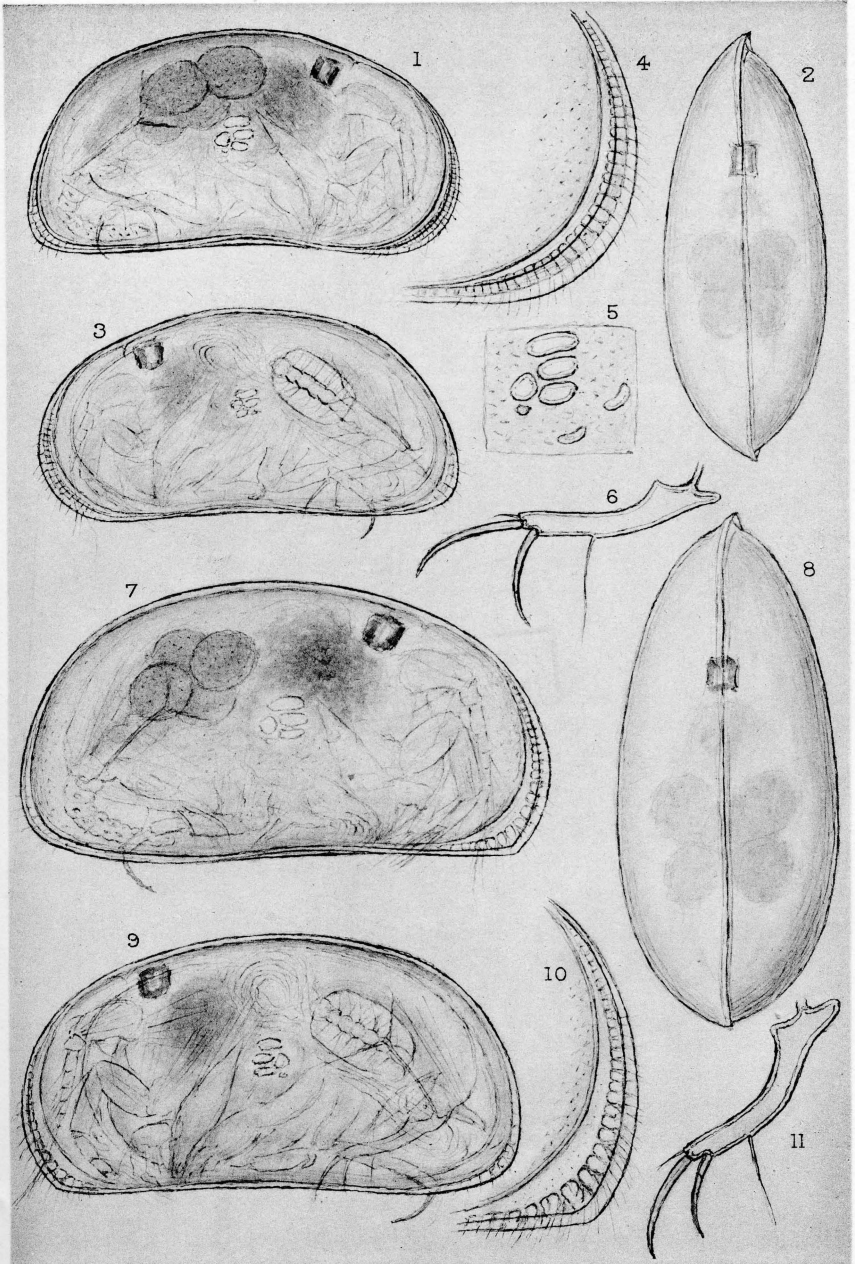
11-12. *P. CONOIDEA* G.O.SARS.



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PARACYPRIA OBTUSA G.O.SARS.

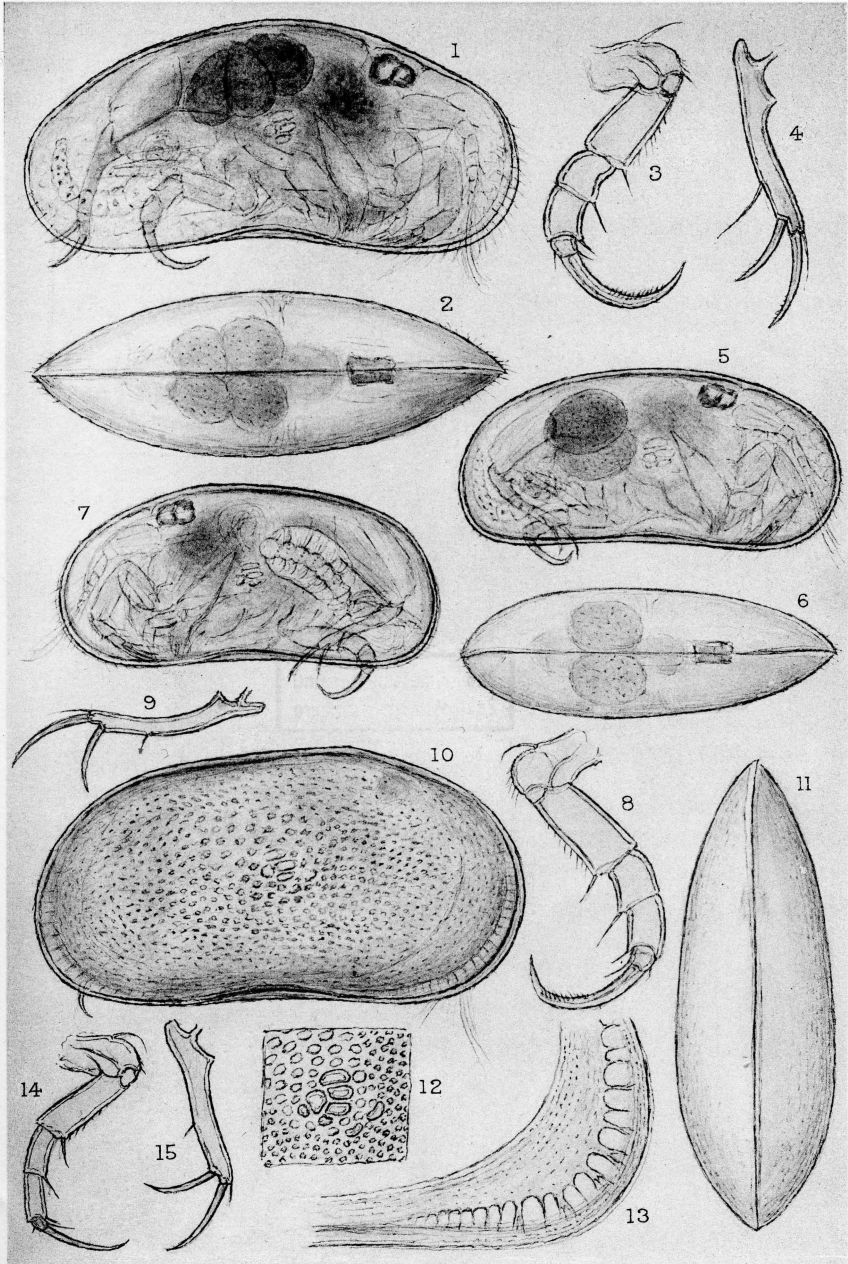


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1-6. PARACYPRIA DEFLEXA G.O.SARS.

7-11. P. SUBANGULATA G.O.SARS.



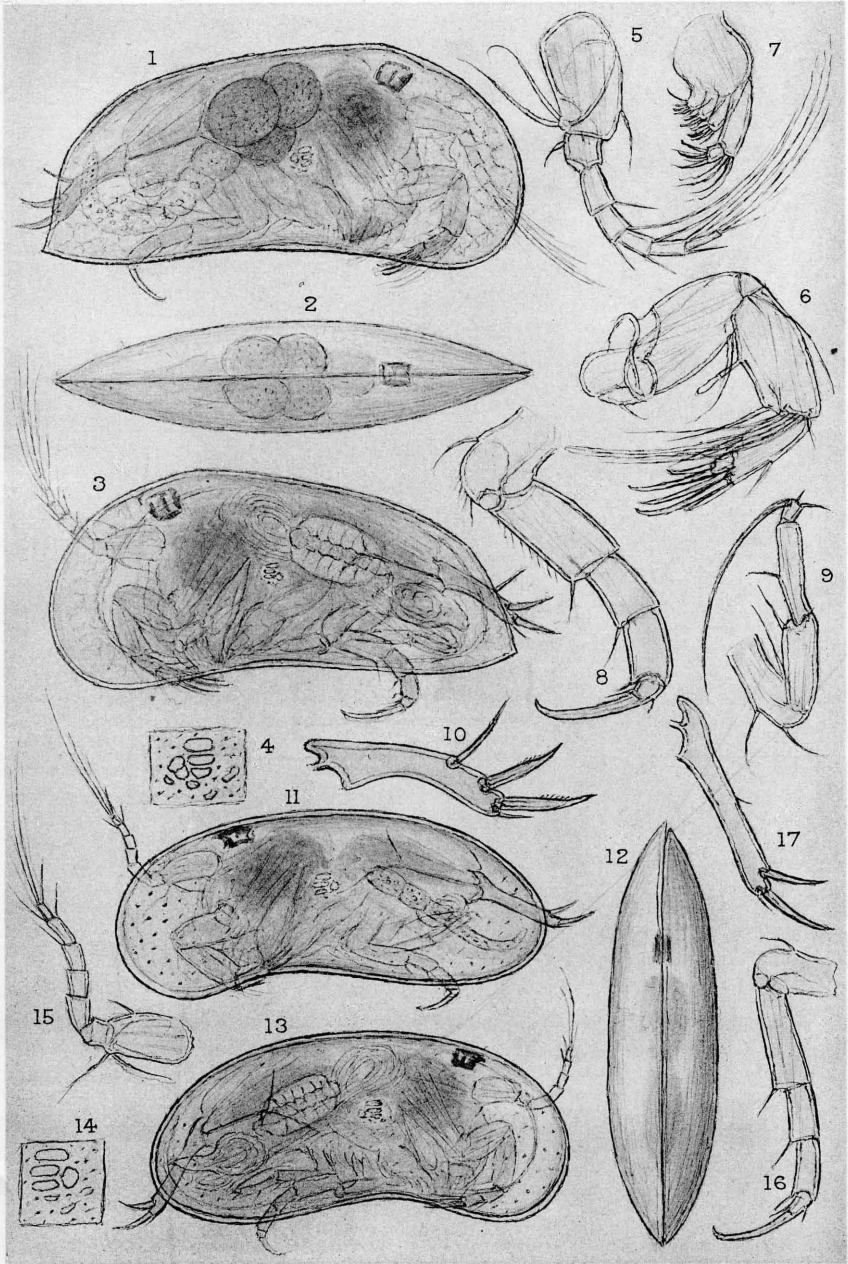
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1-4. *PARACYPRIA RENIFORMIS* G.O.SARS.

5-9. *P. HUMILIS* G.O.SARS.

10-15. *P. OPACA* G.O.SARS.

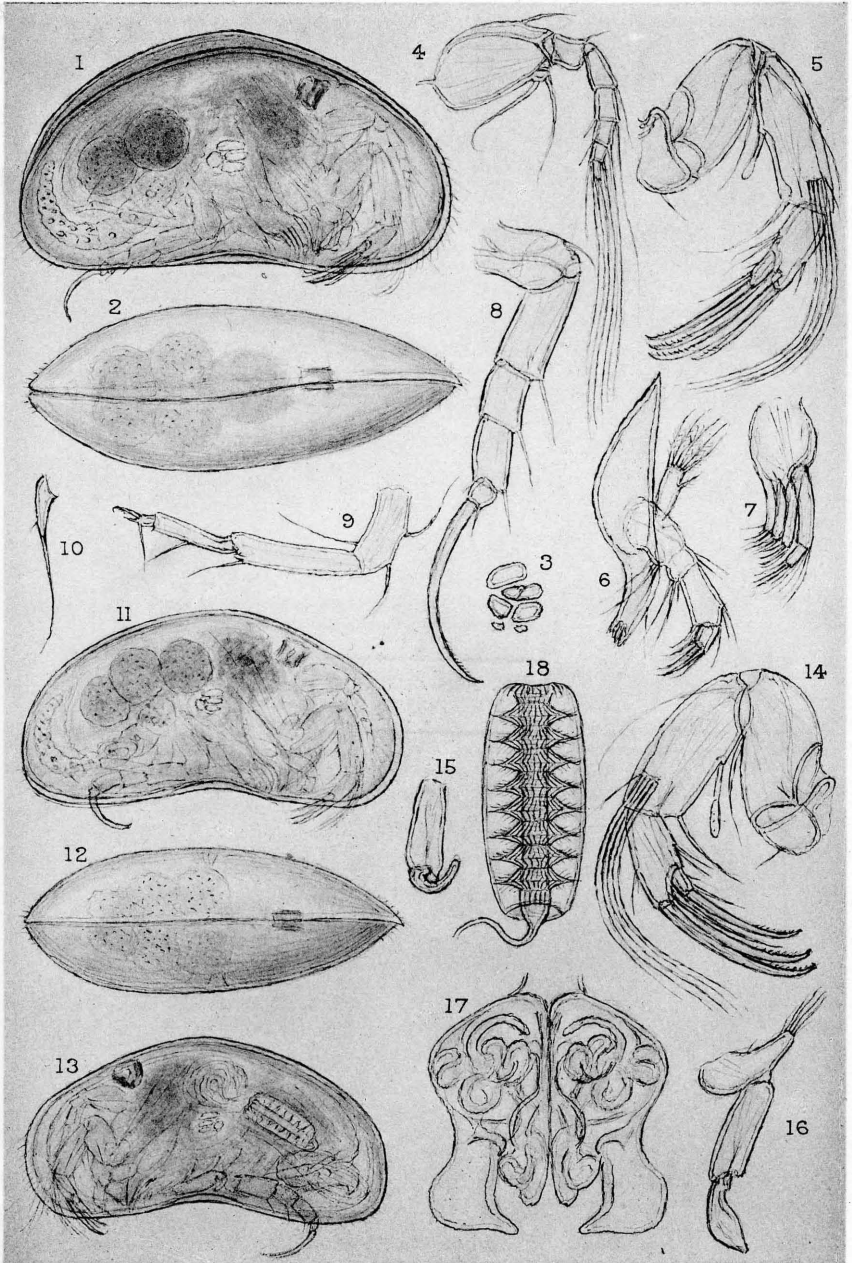


G.O. Sars.

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1-10. *PARACYPRIA CLAVIFORMIS* G.O.SARS.

11-17. *P. FLEXUOSA* G.O.SARS.

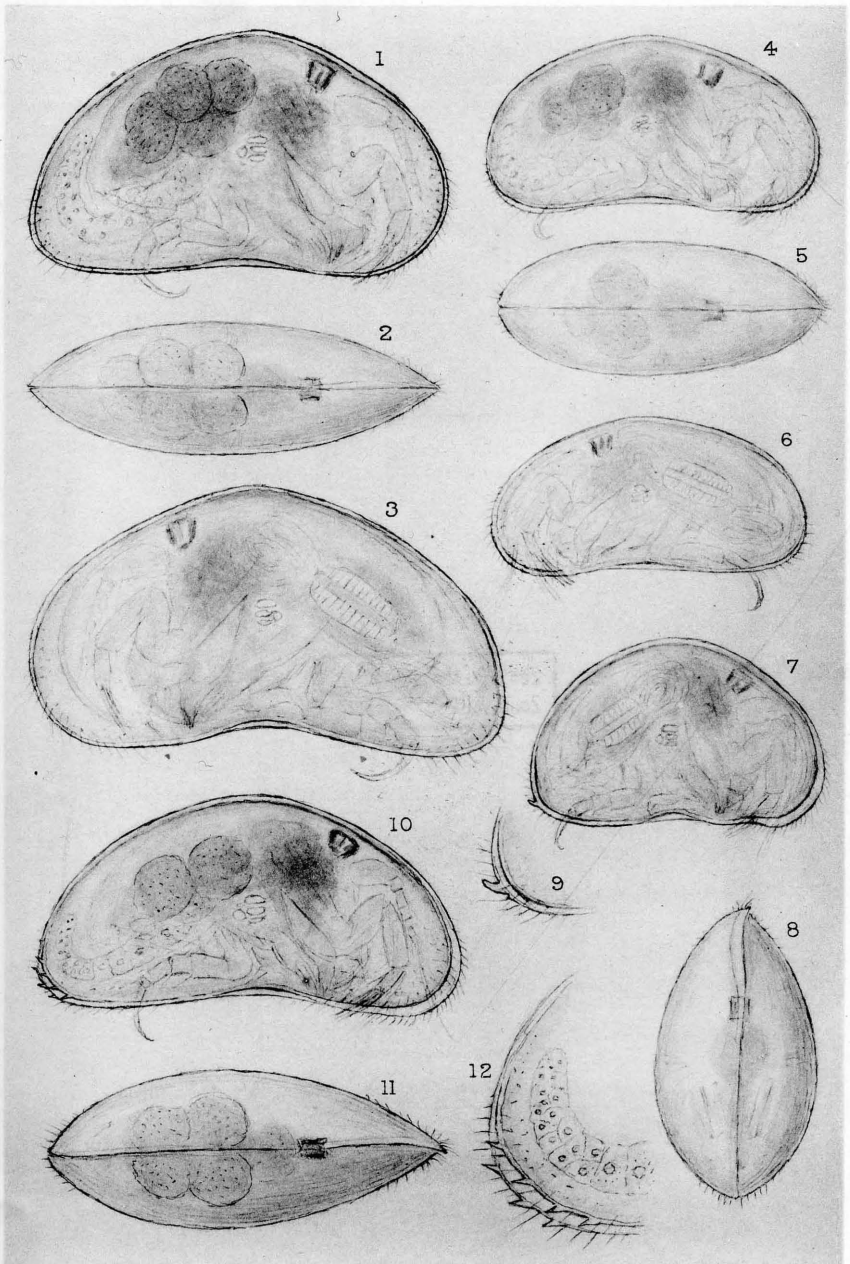


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1-10. *CYPRIDOPSIS OBLIQUATA* G.O.SARS.

11-18. *C. SINUATA* G.O.SARS.



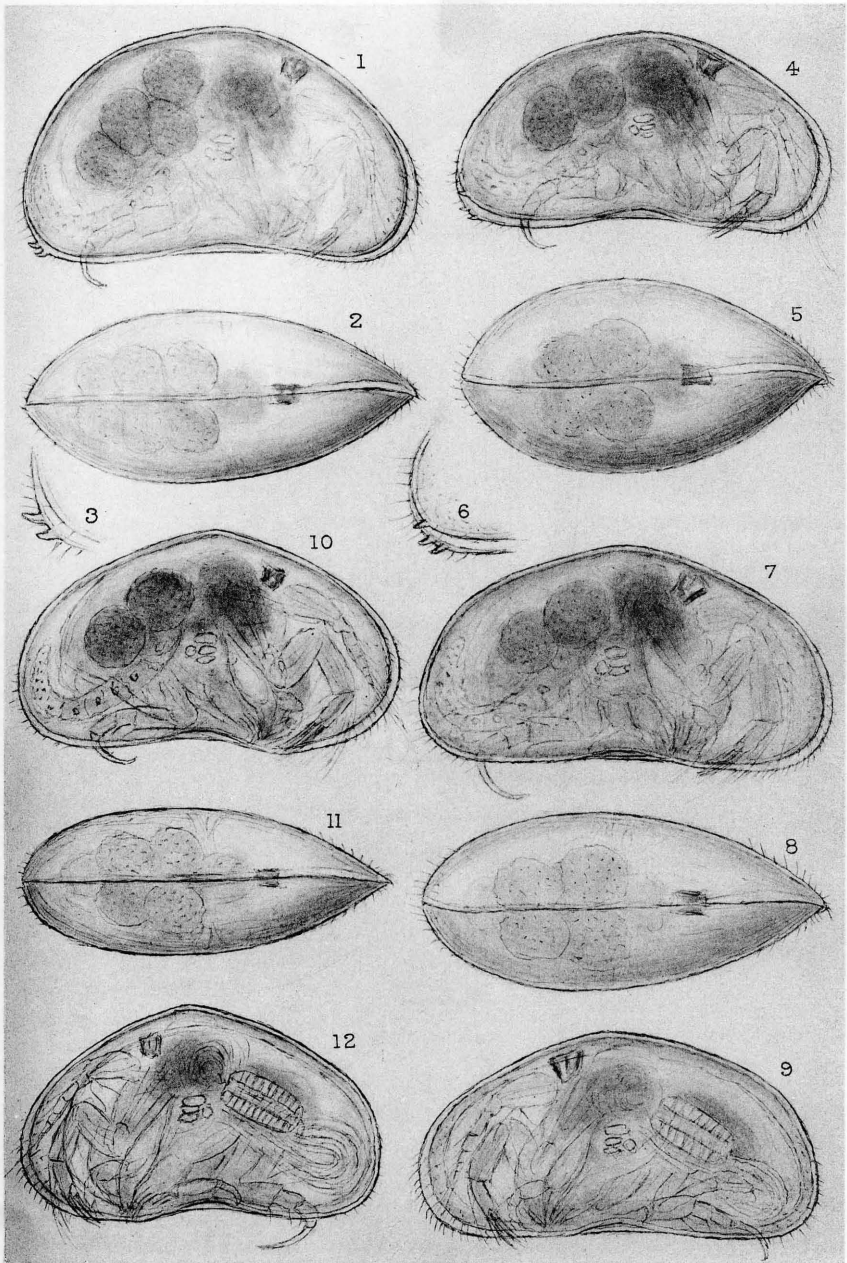
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1-3. CYPRIDOPSIS CUNNINGTONI G.O.SARS.

4-6. C. PUSILLA G.O.SARS. 7-9. C. MONODONTA G.O.SARS.

10-12. C. SERRATA G.O.SARS.



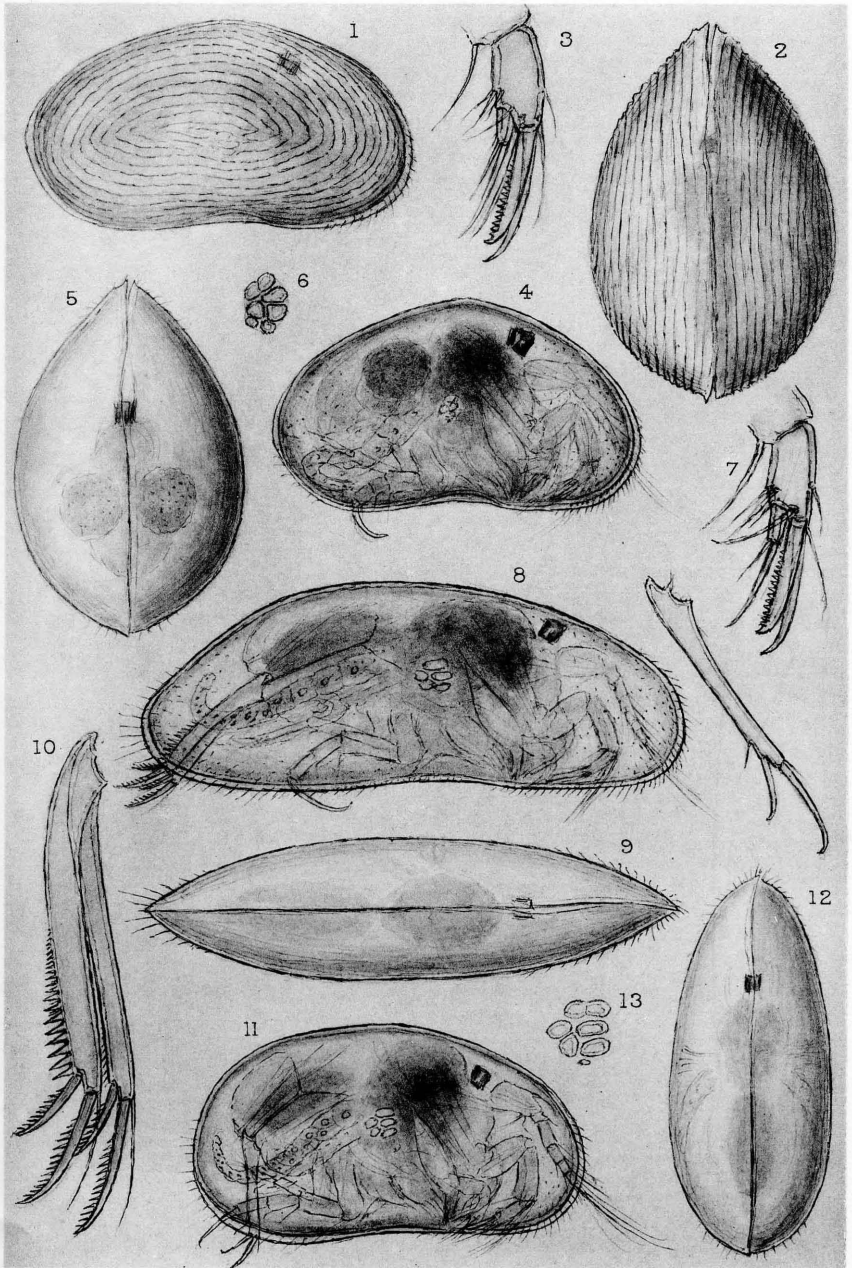
G.O. Sars.

London Stereoscopic Co. Imp.

1-3. CYPRIDOPSIS BIDENTATA G.O.SARS.

4-6. C. TUMIDULA G.O.SARS.

7-9. C. CONGENERA G.O.SARS. 10-12. C. GIBBA G.O.SARS.



G.O. Sars.

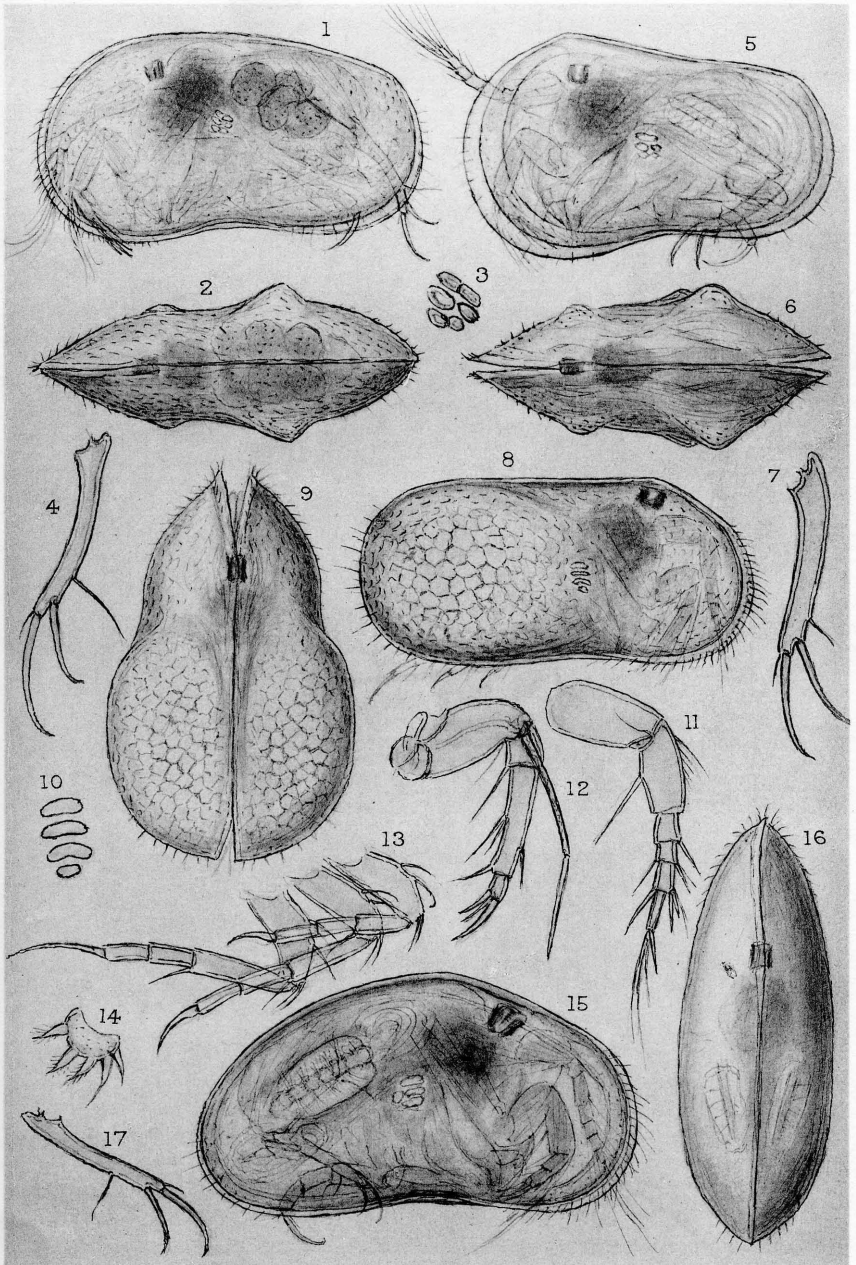
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1-3. ZONOCYPRIS COSTATA VÄVRA.

4-7. Z. LÆVIS G.O.SARS.

8-10. STENOCYPRIS PERARMATA BRADY.

11-14. HETEROCYPRIS DUBIA G.O.SARS.



G.O Sars.

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1-4. ILYOCYPRIS PROPINQUA G.O.SARS.
5-7. I. ALTA G.O.SARS.
8-14. LIMNICY THERE OBTUSATA G.O.SARS.
15-17. PARACYPRIA CURTA G.O.SARS.

Ejaculatory tubes each with eight whorls of chitinous stripes, both extremities conspicuously dilated and encircled by a row of coarser spiniform processes.

Remarks.—The type of this new genus is the form described by the present author from a brackish-water lagoon on the Chatham Islands under the name *Paracypris tenuis**. It was, indeed, only with great doubt that I provisionally referred this form to the marine genus *Paracypris* G. O. Sars. I now find that it is much more closely related to the genus *Cypria* Zencker, for which reason I propose to name the new genus *Paracypria*. The species from the Chatham Islands is closely allied to some of the Tanganyika species, as will be shown below. No less than twelve different species referable to this genus have been found in the samples.

1. *PARACYPRIA DECLIVIS*, sp. n. (Plate LXIV. figs. 1–8.)

Specific Characters.—**FEMALE.** Shell moderately compressed; seen laterally (fig. 1) of oblong cuneiform shape, greatest height occurring somewhat in front of the middle and not attaining half the length, anterior extremity obtusely rounded, posterior much narrower and ending below in a somewhat conical blunt corner, dorsal margin strongly curved in the middle and sloping evenly behind to the posterior corner, ventral margin nearly perfectly straight; seen dorsally (fig. 2) narrow oblong in form, with the greatest width about equalling one-third of the length, both extremities acuminated, side-edges nearly parallel in the middle. Valves only slightly unequal and very thin and pellucid, with very slight trace of hairs at the extremities. Surface of shell quite smooth and shining, without any distinct sculpturing. Limbs (figs. 4, 5), on the whole, very like those in the type species; the slender dactylus of the anterior legs (fig. 4), however, quite smooth, without any trace of lateral denticles. Caudal rami (fig. 6) slightly curved at the base; claws rather strong and perfectly smooth, the distal one much the larger and exceeding half the length of the ramus; dorsal seta small, but distinct.

MALE (fig. 3) a little smaller than female, and having the shell somewhat less vaulted dorsally. Prehensile palps of posterior maxillæ (figs. 7, 8), as usual, somewhat unequal on left and right sides, and apparently differing a little in shape from those in the type species.

Length of shell ♀ 0.91 mm., height 0.42 mm., width 0.30 mm.

Remarks.—This form is closely allied to the type species, exhibiting a very similar shape of the shell. It is, however, of considerably larger size, and moreover differs in the less compressed shell and in the more robust and quite smooth caudal claws. Nor is there any trace of the fine denticles found in *P. tenuis* on the dactylus of the anterior legs.

* Zool. Jahrbücher, vol. xxi. pt. 4, p. 404, pl. xx, figs. 173–186.

Occurrence.—Solitary specimens of this fine species were found in three different samples from Tanganyika. One of these samples (88) was taken 7/9/04 at Niamkolo (S. end of lake), another (97) 19/9/04 at about the same place, and the third (138) 13/10/04 at Sumbu (S.W. of lake).

2. *PARACYPRIA COMPLANATA*, sp. n. (Plate LXIV. figs. 9, 10.)

Specific Characters.—*MALE*. Shell highly compressed; seen laterally (fig. 9) oval reniform in shape, greatest height occurring about in the middle and equalling half the length, anterior extremity obliquely rounded and somewhat deflexed, posterior narrower and obtuse at the end, dorsal margin almost angularly curved in the middle and sloping behind with a slight curve to the posterior extremity, ventral margin slightly concave in the middle; seen dorsally (fig. 10) very narrow, with the greatest width scarcely exceeding one-quarter of the length. Valves rather pellucid and somewhat more unequal than in the preceding species, the right one being conspicuously overlapped by the left at the anterior extremity below. Surface of shell with scattered dots and finely hairy at both extremities.

Length of shell 0.96 mm., height 0.49 mm., width 0.24 mm.

Remarks.—This form is of still larger size than the preceding one, from which it moreover differs conspicuously in the form and sculpture of the shell. The structure of the several appendages could not be sufficiently examined in the solitary specimen found, but no essential difference in this respect from that in the preceding species was to be traced.

Occurrence.—Only a single specimen of this form, a fully grown male, has been secured. It was found in a sample from Tanganyika (242) taken 1/3/05 at Kaboge (N.W. shore of the lake).

3. *PARACYPRIA CONOIDEA*, sp. n. (Plate LXIV. figs. 11, 12.)

Specific Characters.—*MALE*. Shell rather compressed; seen laterally (fig. 11) of a narrow, somewhat conoid shape, greatest height occurring far in front and about equalling half the length, anterior extremity evenly rounded and much broader than the posterior, which is conically tapered, though obtuse at the end, dorsal margin gently curved and sloping evenly behind to the posterior corner, ventral margin nearly straight; seen dorsally (fig. 12) narrow oblong in form, with the greatest width about equalling one-third of the length, both extremities obtusely acuminate. Valves moderately pellucid and rather unequal, the right being considerably overlapped by the left along the whole anterior extremity; lip of the latter somewhat thickened and giving origin to a row of very delicate hairs. Surface of shell dotted in a similar manner to that in *P. complanata*.

Length of shell 0.49 mm., height 0.24 mm., width 0.15 mm.

Remarks.—This is a rather small species, being scarcely more

than half as large as *P. complanata*. The specimen examined is, however, evidently fully grown, as proved by the well-developed ejaculatory tubes shining through the pellucid shell. The shape of the latter conspicuously differs from that of either of the two preceding species.

Occurrence.—A solitary male specimen of this form was found in a sample from Tanganyika (138), taken 13/10/04 at Sumbu (S.W. of lake).

4. PARACYPRIA OBTUSA, sp. n. (Plate LXV.)

Specific Characters.—FEMALE. Shell moderately compressed; seen laterally (fig. 1) of oval or elliptical shape, greatest height occurring about in the middle and slightly exceeding half the length, both extremities obtusely rounded and nearly equal; dorsal margin gently curved with trace of an angle behind the ocular region, ventral margin very slightly concaved in the middle; seen dorsally (fig. 2) oblong in shape, greatest width somewhat exceeding one-third of the length and occurring a little behind the middle, anterior extremity narrower and more acuminate than the posterior. Valves rather thin and pellucid, conspicuously unequal, the right one being overlapped by the left along the whole anterior extremity, as also a little behind; anterior lips of both valves bordered by a very thin and pellucid rim. Surface of shell exhibiting a very fine longitudinal striation, only visible under high magnifying-powers (fig. 4), and clothed at each extremity with extremely delicate hairs. Inner coating of valves exhibiting a somewhat irregular reticulation, more conspicuous at the anterior extremity (fig. 1). Limbs (figs. 5–11) on the whole somewhat more strongly built than in the type species, but otherwise identical in structure. Caudal rami (fig. 12) slightly curved, with the claws moderately strong and less unequal than in *P. declivis*, the distal one about equalling half the length of the ramus; dorsal seta well developed and rather slender.

MALE (fig. 3) of about same size as female, and having the shell very similar in shape. Sexual characters, manifested in the structure of the inferior antenna (fig. 13), the palps of the posterior maxillæ (figs. 14, 15), the copulatory appendages (fig. 16), and the ejaculatory tubes (fig. 17), agreeing exactly with those in other species of this genus.

Length of shell 0.63 mm., height 0.33 mm., width 0.22 mm.

Remarks.—In the general shape and sculpture of the shell, this form exhibits a certain resemblance to the species of the genus *Cypria* Zencker, and, indeed, at first I was inclined to regard it as a member of that genus. On a closer comparison and examination of the several appendages, I find it, however, impossible to separate this form generically from the other species here recorded as belonging to the genus *Paracypria*.

Occurrence.—This species seems to be by far the commonest of the Ostracoda of the Tanganyika Expedition. I have noted it

in five of the samples from Tanganyika, and in some of these it occurred rather abundantly. The localities are as follows: No. 82, Kituta Bay (S. end of lake), No. 97, Niamkolo (S. end of lake), No. 138, Sumbu (S.W. of lake), No. 169, Kala (E. shore of lake), No. 240, Baraka (N.W. shore). In the last-named locality it seems to have occurred in great abundance, and a good many of the specimens captured had also been separated from the sample by Dr. Cunnington and placed in a small tube.

5. *PARACYPRIA DEFLEXA*, sp. n. (Plate LXVI. figs. 1-6.)

Specific Characters.—FEMALE. Shell moderately compressed; seen laterally (fig. 1) of oval reniform shape, greatest height occurring somewhat behind the middle and slightly exceeding half the length, anterior extremity evenly rounded, posterior scarcely narrower and obliquely deflexed, terminating in an obtusely triangular corner, dorsal margin evenly curved with the greatest curvature behind the middle and sloping rather steeply to the deflexed hind corner of the shell, ventral margin very slightly concave in the middle; seen dorsally (fig. 2) oblong-ovate in form, with the greatest width exceeding one-third of the length, anterior extremity somewhat narrower than posterior. Valves rather unequal, the right being considerably overlapped by the left both in front and behind, anterior lip of left valve (fig. 4) exhibiting a somewhat thickened zone crossed by numerous grooves, from the bottom of which delicate hairs arise. Surface of shell smooth and shining, though exhibiting a few small dots similar to those found in *P. complanata* and *P. conoidea*. Muscular impressions in the centre of each valve (fig. 5) very distinct and arranged as in the other species of this genus. Caudal rami (fig. 6) distinctly curved; claws moderately strong and only slightly unequal, the distal one exceeding half the length of the ramus; dorsal seta well developed and rather slender.

MALE (fig. 3) a little smaller than female, but exhibiting a closely similar shape of the shell.

Length of shell ♀ 0.75 mm., height 0.40 mm., width 0.26 mm.

Remarks.—In external appearance this form somewhat resembles a *Candona*, the shell exhibiting in the lateral aspect a rather similar shape and having the hind corner deflexed in a similar manner to that found in the more typical species of that genus. It is, however, a true *Paracypria*, as proved by the examination of the several appendages, which agree closely in structure with those in *P. obtusa*.

Occurrence.—Of this species also a considerable number of specimens has been secured. I have noted it in four of the Tanganyika samples. In two of these samples (138 and 240) it occurred rather plentifully in company with *P. obtusa*. In the other two (97 and 169) only solitary specimens were found. The localities from which the samples were taken have been recorded above.

6. *PARACYPRIA SUBANGULATA*, sp. n. (Plate LXVI. figs. 7-11.)

Specific Characters.—FEMALE. Shell somewhat less compressed than in the preceding species; seen laterally (fig. 7) broadly oval in form, greatest height occurring nearly in the middle and considerably exceeding half the length, anterior extremity obliquely rounded and subangular below, posterior scarcely narrower and terminating in a slightly deflexed obtuse corner, dorsal margin forming a rather even curve, ventral almost straight; seen dorsally (fig. 8) oblong-oval in shape, greatest width occurring behind the middle and almost attaining half the length, both extremities somewhat blunted at the end. Valves less pellucid than in the preceding species and very unequal, the right one being considerably overlapped by the left both in front and behind; anterior lip of right valve simple and evenly curved, that of left valve (fig. 10) forming below an abrupt angular bend and exhibiting inside the hyaline border a thickened zone crossed by a number of somewhat irregular branching grooves. Surface of shell smooth and very finely hairy at each extremity. Caudal rami (fig. 11) considerably curved; claws of moderate size and slightly unequal, the distal one about half the length of the ramus; dorsal seta slender and elongated. Ends of ovarial tubes in this and the two preceding species deflexed.

MALE (fig. 9) a little smaller than female and having the shell somewhat less vaulted above.

Length of shell ♀ 0.86 mm., height 0.48 mm., width 0.39 mm.

Remarks.—This form is undoubtedly nearly related to the two preceding species, but is of considerably larger size than either of them, and is, moreover, easily recognized by the more vaulted shell and especially by the peculiar angular appearance of the anterior extremity caused by the projecting lip of the left valve.

Occurrence.—Only three specimens of this form, two females and one male, have come under my notice. They were found in a sample from Tanganyika (53) taken 9/8/04 at Niamkolo (S. end of lake).

7. *PARACYPRIA RENIFORMIS*, sp. n. (Plate LXVII. figs. 1-4.)

Specific Characters.—FEMALE. Shell not much compressed; seen laterally (fig. 1) oblong reniform in shape, greatest height occurring in the middle and not nearly attaining half the length, anterior extremity evenly rounded, posterior somewhat narrower and obtuse at the end, not deflexed, dorsal margin forming a quite even curve throughout, ventral one rather deeply sinuated in the middle; seen dorsally (fig. 2) oblong fusiform in shape, greatest width exceeding one-third of the length and occurring in the middle, both extremities acuminate. Valves very thin and pellucid, only slightly unequal; left valve, however, as usual, overlapping the right a little along the anterior extremity; lips

of both valves thin and pellucid. Surface of shell quite smooth, without any trace of sculpture, but distinctly hairy at both extremities. Eye very large and conspicuous. Anterior legs (fig. 3) much more coarsely built than in any of the preceding species, dactylus very strong, with falciform curve and clothed inside in its outer part with fine spinules. Caudal rami (fig. 4) of the structure characteristic of the genus, being slightly curved at the base and a little tapered distally; claws rather strong and finely spinulose inside, the distal one about half the length of the ramus; dorsal seta well developed. Ends of ovarial tubes not deflexed, but extending upwards along the posterior edges of the valves (fig. 1).

Length of shell 0.61 mm., height 0.28 mm., width 0.21 mm.

Remarks.—This form is easily distinguishable from any of the preceding ones by the narrow and pronouncedly reniform shell and by the coarsely built anterior legs. In the structure of the other limbs I have failed to detect any essential difference from those in the preceding species.

Occurrence.—Only two female specimens of this form have come under my notice. They were found in a sample from Tanganyika (169), taken 18/11/04 at Kala (E. shore of lake).

8. PARACYPRIA HUMILIS, sp. n. (Plate LXVII. figs. 5-9.)

Specific Characters.—FEMALE. Shell rather compressed; seen laterally (fig. 5) of narrow elliptical form, greatest height occurring about in the middle and not attaining half the length, both extremities obtusely rounded and nearly equal, dorsal margin very slightly curved, ventral nearly straight; seen dorsally (fig. 6) narrow oblong in form, greatest width only slightly exceeding one-third of the length and occurring behind the middle, both extremities somewhat blunted at the end, the anterior narrower than the posterior. Valves rather pellucid, though not so thin as in *P. reniformis*, and only slightly unequal. Surface of shell smooth, and finely hairy at each extremity. Anterior legs (fig. 8) resembling in structure those in *P. reniformis*, being very coarsely built, with the dactylus strong and abruptly curved at the end. Caudal rami (fig. 9) markedly curved, claws moderately strong and quite smooth, dorsal seta very small.

MALE (fig. 7) of about same size as female, and scarcely differing in the shape of the shell.

Length of shell 0.48 mm., height 0.22 mm., width 0.16 mm.

Remarks.—This is a very small species and may easily be recognized by the rather regular elliptical shape of the shell. It is undoubtedly nearest allied to *P. reniformis*, exhibiting a very similar strong development of the anterior legs.

Occurrence.—Some few specimens of this form were found in a sample from Tanganyika (138), taken 13/10/04 at Sumbu (S.W. of lake), and a solitary male specimen was found in the same sample (169) in which *P. reniformis* occurred.

9. *PARACYPRIA OPACA*, sp. n. (Plate LXVII. figs. 10-15.)

Specific Characters.—FEMALE. Shell moderately compressed; seen laterally (fig. 10) oval in shape, greatest height occurring somewhat in front of the middle and exceeding half the length, both extremities obtusely rounded, the anterior one somewhat broader than the posterior, dorsal margin almost straight in the middle, with slight trace of an angle immediately behind the ocular region, ventral margin very slightly concave in the middle; seen dorsally (fig. 11) oblong in shape, greatest width somewhat exceeding one-third of the length and occurring behind the middle. Valves rather thick and more or less opaque, so as not to allow the limbs to be traced through their walls; left valve, as usual, a little larger than right and overlapping it along the whole anterior extremity, anterior lip of this valve considerably thickened and crossed by a number of somewhat irregular grooves, some of which divide at the end into fine stripes (fig. 13); inner duplicatures of both valves rather broad. Surface of shell of a dull appearance, being sculptured by numerous impressed dots, larger and more distant in the centre of the valves (see fig. 12), very densely crowded in the peripheral parts, where they are partly arranged in curved lines (fig. 10). Anterior legs (fig. 14) less strongly built than in the two preceding species, with the dactylus rather slender and only slightly curved. Caudal rami (fig. 15) almost straight, claws of moderate size, dorsal seta very small.

Length of shell 0.63 mm., height 0.34 mm., width 0.22 mm.

Remarks.—By the thick opaque shell with its pronounced sculpture, this form looks very unlike the other species of the genus. On a closer examination of the several appendages, however, I have failed to detect any essential difference in their structure from that of the more typical species, and find it thus impossible to separate this form generically.

Occurrence.—Some few female specimens of this species were found in the same sample (138) in which *P. humilis* occurred. Solitary specimens were, moreover, found in two other samples from Tanganyika, the one (82) taken 27/8/04 in Kituta Bay, the other (97), 19/9/04, at Niamkolo, both localities lying at the south end of the lake.

10. *PARACYPRIA CLAVIFORMIS*, sp. n. (Plate LXVIII. figs. 1-10.)

Specific Characters.—FEMALE. Shell highly compressed; seen laterally (fig. 1) oblong claviform in shape, greatest height occurring far in front and not attaining half the length, anterior extremity obliquely rounded and somewhat deflexed, posterior much narrower and exerted below to a triangular posteriorly pointing corner, dorsal margin subangular in the ocular region and sloping obliquely behind, being for some extent nearly straight, ventral margin evenly concave in the middle; seen dorsally (fig. 2) narrow fusiform in outline, greatest width not nearly attaining one-third of the length and occurring in the

middle, both extremities acuminate. Valves very thin and pellucid, nearly equal and without any visible pilosity. Surface of shell quite smooth; inner coating exhibiting a faint reticulation, more obvious at the anterior extremity. Muscular impressions in the centre of the valves densely crowded and arranged in the usual manner (fig. 4). Limbs (figs. 5-9) on the whole built upon the same type as in the other species. Caudal rami (fig. 4) unusually short and broad, evenly curved and highly chitinized; claws rather thick and scarcely at all curved, their outer part being clothed inside with fine spinules; dorsal seta well developed.

MALE (fig. 3) of about same size as female, and exhibiting a very similar shape of the shell. Sexual characters developed in the very same manner as in the other species of the genus.

Length of shell 0.58 mm., height 0.28 mm., width 0.17 mm.

Remarks.—This is a very distinct species, exhibiting a rather characteristic shape of the shell, and also distinguished by the coarse structure of the caudal rami. It must, however, evidently be regarded as a member of the present genus, as proved by the structure of the several limbs.

Occurrence.—Several specimens of this remarkable form, the greater number of them still immature, were picked up from the bottom-residue of a sample from Tanganyika (138), taken 13/10/04 at Sumbu (S.W. of lake). It was not found in any of the other samples.

11. *PARACYPRIA FLEXUOSA*, sp. n. (Plate LXVIII. figs. 11-17.)

Specific Characters.—FEMALE. Shell highly compressed, seen laterally (fig. 11) narrow reniform in shape, greatest height occurring about in the middle and not nearly attaining half the length, anterior extremity evenly rounded and conspicuously deflexed, posterior a little narrower and obtuse at the end, dorsal margin only slightly curved, ventral deeply sinuated in front of the middle; seen dorsally (fig. 12) narrow oblong, greatest width scarcely exceeding one-quarter of the length and occurring somewhat behind the middle. Valves rather pellucid and slightly unequal, the right one being somewhat overlapped by the left at the inferior part of both extremities. Surface of shell smooth and shining, without any visible pilosity, but exhibiting a few small dots, more distinct in the anterior part. Eyes of smaller size than in the other species and occurring close to the dorsal margin. Muscular impressions in the centre of the valves (fig. 14) only little differing from those in the other species. Superior antennæ (fig. 15) with the setæ somewhat reduced in number; natatory setæ of the inferior ones apparently likewise less fully developed than usual. Anterior legs (fig. 16) rather slender, with the dactylus comparatively short. Caudal rami (fig. 17) somewhat robust, of equal width throughout, and almost straight; claws comparatively short; dorsal seta very small but distinct, occurring about in the middle of the ramus.

MALE (fig. 13) agreeing with female both in size and in the

shape of the shell, but exhibiting the usual sexual characters, which seem to be fully in accord with those in the other species of the genus.

Length of shell 0.41 mm., height 0.16 mm., width 0.11 mm.

Remarks.—I have been in some doubt about the systematic place of this form. In the general shape and sculpturing of the shell, as also in the apparent reduction of the natatory setæ of both pairs of antennæ, it exhibits a certain resemblance to the species of the genus *Candonopsis* Brady, and indeed at first I was inclined to refer it to that genus. On a closer examination of the two solitary specimens found, I now have been induced to abandon this opinion, and find that this form should more properly be referred to the genus *Paracypria*, though constituting a rather anomalous species.

Occurrence.—Only two specimens of this small Ostracod, a female and a male, have come under my notice. The female specimen was found in a sample from Tanganyika (138), taken 13/10/04 at Sumbu (S.W. of lake). The male specimen was found in another sample from the same lake (109), taken 28/9/04 at Mbete (S. end of lake).

12. PARACYPRIA CURTA, sp. n. (Plate LXXIII. figs. 15–17.)

Specific Characters.—MALE. Shell moderately compressed; seen laterally (fig. 15) of a somewhat triangular form, greatest height occurring a little in front of the middle and exceeding half the length, anterior extremity rather obliquely rounded, posterior narrower and obtuse at the end, dorsal margin considerably arched and sloping behind with a slight curve to the posterior corner, ventral margin slightly concave in the middle; seen dorsally (fig. 16) narrow oblong in form, greatest width somewhat exceeding one-third of the length and occurring behind the middle, both extremities somewhat blunted at the end. Valves thin and pellucid, slightly unequal, and clothed at each extremity with delicate hairs, more densely crowded anteriorly. Surface of shell perfectly smooth. Caudal rami (fig. 17) of quite normal structure, claws rather slender, dorsal seta well developed.

Length of shell 0.55 mm., height 0.30 mm., width 0.20 mm.

Remarks.—This is a well-marked genuine *Paracypria*, somewhat resembling in shape *P. complanata*, but of much smaller size and having the shell considerably more abbreviated.

Occurrence.—A solitary specimen of this form, a fully grown male, was found in a sample from Tanganyika (138), taken at Sumbu (S.W. of lake).

Genus 2. CYPRIDOPSIS Brady.

Syn. *Candonella* Claus.

Cypridopsella Kaufman.

Remarks.—This genus was established in the year 1867 by Prof. Brady, to comprise the three northern species, *C. vidua*,

villosa, and *aculeata*, and was characterized chiefly by the imperfect development of the caudal rami. In the year 1896 Messrs. Brady and Norman separated one of these species, viz. *C. vidua*, from the other two under a new genus *Pionocypris*, to which they also referred the Australian form described by the present author as *Cypridopsis globulus*. As pointed out by Dr. Vávra, these two species, however, are not congeneric, *P. vidua* having the caudal rami rudimentary, whereas in the Australian species they are normally developed, proving it to belong to the genus *Cypretta* of Vávra. The genus *Pionocypris* therefore must be restricted to *P. vidua* and allied European species (*helvetica*, *obesa*, *picta*). I think we are bound to accept the arrangement proposed by the British authors, according to which the type of the genus *Cypridopsis* is not, as suggested by Dr. Vávra and Dr. Kaufman, *C. vidua*, but *C. villosa*, which was referred by Dr. Vávra to the genus *Candonella* Claus, by Dr. Kaufman to his genus *Cypridopsella*.

A third genus, likewise with rudimentary caudal rami, but with reduced natatory setæ on the inferior antennæ, was established by Brady under the name *Potamocypris*. The genus *Paracypridopsis* of Kaufman is in all probability identical with that genus. We have thus three northern generic types, all with rudimentary caudal rami, viz. *Cypridopsis*, *Pionocypris*, and *Potamocypris*, to which recently a fourth African type, *Zonocypris*, has been added by Dr. G. W. Müller. Two species of the last-named genus will be described in the sequel; the other ten species of the "*Cypridopsis*-group" obtained by the Tanganyika Expedition I provisionally refer to the genus *Cypridopsis*, as restricted by Messrs. Brady and Norman.

13. CYPRIDOPSIS OBLIQUATA, sp. n. (Plate LXIX. figs. 1-10.)

Specific Characters.—FEMALE. Shell moderately tumid; seen laterally (fig. 1) of oval triangular shape, greatest height occurring a little behind the middle and exceeding half the length, both extremities obliquely rounded and nearly equal, dorsal margin strongly arched in the middle, ventral nearly straight; seen dorsally (fig. 2) oblong-ovate in form, greatest width considerably exceeding one-third of the length and occurring a little behind the middle, anterior extremity narrower than posterior. Valves rather pellucid and very conspicuously unequal, the left one being much the larger and overlapping the right, not only anteriorly, but also along the greater part of the dorsal face, whereby the shell assumes a peculiar oblique appearance*. Surface of shell smooth, but rather densely hairy at each extremity. Muscular impressions in the centre of the valves (fig. 3) somewhat differing in their arrangement from those in the genus *Paracypria*. Eye large and conspicuous. Superior antennæ (fig. 4) of normal structure. Inferior antennæ (fig. 5) rather coarsely built, with the apical

* It may here be noted that in *C. villosa*, where a similar obliquity of the shell occurs, it is not the left but the right valve which is the larger.

claws strong and partly denticulate inside; natatory setæ issuing at some distance from the end of the second joint and extending about as far as the claws. Mandibular palp (fig. 6) comparatively smaller than in *Paracypria*, with the last joint short and thick. Palp and masticatory lobes of anterior maxillæ (fig. 7) slender and narrow. Anterior legs (fig. 8) comparatively large, with the dactylus strong and evenly curved. Posterior legs (fig. 9) much smaller, and having the reflexed apical seta quite short. Caudal rami (fig. 10) reduced to two small juxtaposed lamellæ of conical form, each terminating in a slender seta and having a small lateral hair. Ends of ovarian tubes, as in most other Cypridæ, ascending along the posterior edges of the valves (fig. 1).

Length of shell 0.53 mm., height 0.30 mm., width 0.22 mm.

Remarks.—This form may be easily distinguished from any of the other species here recorded by the peculiar obliquity of the shell, the left valve overlapping conspicuously the right dorsally, in such manner that, in the lateral view of the shell (fig. 1), the line of junction between the valves cuts off, as it were, on the right side a narrow marginal area, extending along the greater part of the dorsal side.

Occurrence.—Two or three female specimens of this form were found in the same sample (138) from which *Paracypria curta* was derived. Moreover, a single specimen, likewise of the female sex, was found in another sample from Tanganyika (150), taken 29/10/04 in Vua harbour (W. shore of lake).

14. CYPRIDOPSIS SINUATA, sp. n. (Plate LXIX. figs. 11–18.)

Specific Characters.—FEMALE. Shell less tumid; seen laterally (fig. 11) of a somewhat reniform shape, greatest height occurring a little in front of the middle and scarcely exceeding half the length, both extremities somewhat obliquely rounded and nearly equal, dorsal margin evenly curved, ventral distinctly sinuated in the middle; seen dorsally (fig. 12) oblong-oval in form, greatest width about equalling two-fifths of the length and occurring somewhat behind the middle, anterior extremity acuminate, posterior more obtuse. Valves rather thin and pellucid, slightly unequal, the left overlapping the right somewhat along the anterior extremity, and at the lower part of the posterior, but not dorsally. Surface of shell smooth and finely hairy at both extremities.

MALE (fig. 13) somewhat smaller than female and slightly differing in the shape of the shell, which is more deeply sinuated below, and has the anterior extremity broader than the posterior and more blunted. Inferior antennæ (fig. 14) of exactly the same structure as in the female, the third joint not being, as in the males of *Paracypria*, subdivided. Prehensile palps of posterior maxillæ (figs. 15 & 16) rather dissimilar on right and left sides, that of right maxilla (fig. 16) having the claw lamella dilated. Copulatory appendages (fig. 17) with the terminal piece securiform in

shape. Ejaculatory tubes (fig. 18) each with eight verticils of chitinous stripes, extremities of tube not dilated.

Length of shell ♀ 0.47 mm., height 0.23 mm., width 0.19 mm.

Remarks.—This form is evidently nearly allied to the preceding one, but is of smaller size and differs conspicuously in the shape of the shell, which, moreover, does not exhibit the characteristic obliquity found in that species.

Occurrence.—Some few specimens of this form were found in the same sample (138) in which the preceding species occurred, and solitary specimens were found in two other samples from Tanganyika, the one (169) taken 18/11/04 at Kala (E. shore of lake), the other (240) 24/2/05 at Baraka (N.W. shore).

15. *CYPRIDOPSIS CUNNINGTONI*, sp. n. (Plate LXX. figs. 1-3.)

Specific Characters.—**FEMALE.** Shell rather compressed; seen laterally (fig. 1) of a somewhat trigonal form, greatest height occurring a little in front of the middle and considerably exceeding half the length; anterior extremity rounded, posterior much narrower and terminating below in an obtuse corner, dorsal margin strongly arched in the middle, ventral one slightly sinuated; seen dorsally (fig. 2) narrow oblong in form, greatest width about equalling one-third of the length and occurring in the middle, both extremities acuminate. Valves rather thin and nearly equal, finely hairy at both extremities. Surface of shell smooth.

MALE (fig. 3) of somewhat larger size than female, and having the shell more deeply sinuated ventrally, with the posterior extremity narrower and more deflexed.

Length of shell ♀ 0.56 mm., height 0.32 mm., width 0.20 mm.

Remarks.—This is a quite genuine *Cypridopsis*, resembling somewhat in shape the type species, *C. villosa* Jurine, but having the shell less densely pilose and the valves much less unequal, without any obvious obliquity of the shell. It is the largest of the species here recorded.

Occurrence.—Two specimens only of this form, a female and a male, have come under my notice. They were derived from a sample (14) taken 17/6/04 in Monkey Bay, Lake Nyasa, and had been separated by Dr. Cunningham in a small tube. I therefore find it appropriate to name this species in honour of the distinguished conductor of the Expedition.

16. *CYPRIDOPSIS PUSILLA*, sp. n. (Plate LXX. figs. 4-6.)

Specific Characters.—**FEMALE.** Shell moderately compressed; seen laterally (fig. 4) oval in form, greatest height occurring a little behind the middle and equalling about half the length, both extremities obtusely rounded and slightly deflexed, nearly equal, dorsal margin somewhat irregularly curved, ventral almost straight; seen dorsally (fig. 5) oblong in form, greatest width about equalling two-fifths of the length and occurring in the middle, both extremities somewhat blunted at the end. Valves

rather thin and pellucid, slightly unequal, and finely hairy at each extremity. Surface of shell perfectly smooth.

MALE (fig. 6) somewhat smaller than female, but exhibiting a very similar shape of the shell.

Length of shell ♀ 0.41 mm., height 0.21 mm., width 0.17 mm.

Remarks.—This form is allied to *C. sinuata*, but of rather smaller size, and differs conspicuously in the nearly straight ventral margin of the shell.

Occurrence.—Some few specimens of this small Ostracod were found in a sample from Tanganyika (138), taken 13/10/04 at Sumbu (S.W. of lake).

17. *CYPRIDOPSIS MONODONTA*, sp. n. (Plate LXX. figs. 7-9.)

Specific Characters.—**MALE.** Shell somewhat tumid; seen laterally (fig. 7) almost semicircular in outline, greatest height occurring in the middle and nearly attaining two-thirds of the length, anterior extremity obliquely rounded, posterior blunted and somewhat deflexed, dorsal margin boldly arched, ventral nearly straight; seen dorsally (fig. 8) subovate in form, greatest width exceeding half the length and occurring behind the middle, both extremities somewhat blunted at the end, the posterior one being the broader. Valves rather unequal, the left one overlapping the right conspicuously along the whole anterior extremity, anterior lip of this valve somewhat deflexed and having below a slight sinus; posterior lip armed at the lower corner with a small recurved dentiform process (fig. 9). Surface of shell smooth, but rather densely hairy at both extremities.

Length of shell ♀ 0.36 mm., height 0.23 mm., width 0.20 mm.

Remarks.—This is the smallest of all the Tanganyika Ostracoda, and is, moreover, easily recognized by the short and tumid shell and by the peculiar dentiform process springing off from the posterior corner of the left valve, a character which has given rise to the specific name here proposed.

Occurrence.—A solitary male specimen of this form was found in the same sample (138) from which *C. pusilla* was derived.

18. *CYPRIDOPSIS SERRATA*, sp. n. (Plate LXX. figs. 10-12.)

Specific Characters.—**FEMALE.** Shell moderately tumid; seen laterally (fig. 10) oblong reniform in shape, greatest height occurring in the middle and about equalling half the length; both extremities obliquely rounded and somewhat deflexed, dorsal margin evenly curved, ventral conspicuously sinuated; seen dorsally (fig. 11) oblong-ovate in form, greatest width about equalling two-fifths of the length and occurring behind the middle, both extremities acuminate. Valves rather unequal, the right being conspicuously overlapped by the left, both anteriorly and posteriorly; each valve exhibiting at the posterior corner a row of extremely delicate triangular serrations, four on right, three on left valve (fig. 12). Surface of shell smooth and finely hairy at both extremities.

Length of shell 0.52 mm., height 0.26 mm., width 0.21 mm.

Remarks.—This form may be easily recognized by its comparatively narrow reniform shell, and more particularly by the peculiar delicate serrations occurring on the posterior corners of both valves, a character from which the specific name here proposed has been derived.

Occurrence.—Of this species also only a single specimen has been secured; a fully grown female. It was found in a sample from Tanganyika (169), taken 18/11/04 at Kala (E. shore of lake).

19. *CYPRIDOPSIS BIDENTATA*, sp. n. (Plate LXXI. figs. 1-3.)

Specific Characters.—**FEMALE.** Shell moderately tumid; seen laterally (fig. 1) rounded triangular in shape, greatest height occurring in the middle and considerably exceeding half the length, both extremities obliquely rounded and somewhat deflexed, the posterior one more blunted than the anterior, dorsal margin boldly arched and sloping more steeply to the anterior than to the posterior extremity, ventral margin nearly straight; seen dorsally (fig. 2) subovate in form, greatest width about half the length and occurring behind the middle, anterior extremity narrower than posterior. Valves slightly unequal, the left overlapping the right along the anterior extremity, as also at the lower part of the posterior one, hind corner of this valve armed with two recurved dentiform processes (fig. 3) similar to that found in *C. monodonta*. Surface of shell smooth, but rather densely hairy at each extremity.

MALE of about same size as female and exhibiting a similar shape and armature of the shell.

Length of shell 0.49 mm., height 0.29 mm., width 0.23 mm.

Remarks.—This form somewhat resembles *C. monodonta* in the shape and armature of the shell, but is of considerably larger size, and is, moreover, distinguished by the presence of two dentiform processes, instead of a single one, at the posterior corner of the left valve.

Occurrence.—Two specimens of this form, a male and a female, were found in a sample from Tanganyika (97), taken 19/9/04 at Niamkolo (S. end of lake).

20. *CYPRIDOPSIS TUMIDULA*, sp. n. (Plate LXXI. figs. 4-6.)

Specific Characters.—**FEMALE.** Shell unusually tumid; seen laterally (fig. 4) of oval reniform shape, greatest height occurring somewhat in front of the middle and scarcely exceeding half the length; anterior extremity obliquely rounded, posterior scarcely narrower and blunted at the end; dorsal margin somewhat irregularly curved, sloping more steeply in front than behind, ventral margin distinctly concave in the middle: seen dorsally (fig. 5) ovate in form, greatest height exceeding half the length and occurring about in the middle, anterior extremity narrower than posterior. Valves rather unequal, the left one considerably over-

lapping the right along the anterior extremity as also somewhat along the lower part of the posterior, hind corner of this valve armed with two delicate triangular teeth, that of right valve with a single such tooth placed somewhat farther above (fig. 6). Surface of shell smooth, but rather densely hairy at both extremities.

Length of shell 0.47 mm., height 0.24 mm., width 0.25 mm.

Remarks.—This form may at once be distinguished from any of the other species here recorded by the unusually tumid shell, the width of which even somewhat exceeds the height. The armature of the hind corner of each valve is also characteristic.

Occurrence.—A solitary female specimen of this form was found in a sample from Tanganyika (138), taken 13/10/04 at Sumbu (S.W. of lake).

21. CYPRIDOPSIS CONGENERA, sp. n. (Plate LXXI. figs. 7-9.)

Specific Characters.—FEMALE. Shell moderately tumid; seen laterally (fig. 7) of oval reniform shape, greatest height occurring about in the middle and slightly exceeding half the length, both extremities rounded and slightly deflexed, dorsal margin irregularly curved, with trace of an angle behind the ocular region, ventral margin very slightly concave in the middle; seen dorsally (fig. 8) oblong-ovate in form, greatest width occurring behind the middle and not attaining half the length, anterior extremity acuminate, posterior blunted. Valves slightly unequal, left valve overlapping the right somewhat along the anterior extremity, but scarcely behind. Surface of shell smooth and finely hairy at both extremities.

MALE (fig. 9) a little smaller than female and having the posterior extremity of the shell somewhat narrower.

Length of shell 0.52 mm., height 0.28 mm., width 0.23 mm.

Remarks.—This form is closely allied to *C. sinuata*, exhibiting a rather similar shape of the shell. It is, however, of larger size and has the ventral margin of the shell much less sinuated.

Occurrence.—Three specimens of this form, two females and one male, were found in the same sample from which *C. tumidula* was derived.

22. CYPRIDOPSIS GIBBA, sp. n. (Plate LXXI. figs. 10-12.)

Specific Characters.—FEMALE. Shell somewhat compressed; seen laterally (fig. 10) of oval trigonal shape, greatest height occurring about in the middle and exceeding half the length, anterior extremity broadly rounded, posterior somewhat narrower and blunted at the end; dorsal margin forming in the middle an abrupt angular curve and sloping from thence evenly to each extremity, ventral margin exhibiting in the middle a distinct sinus, in front of which is a slight convexity: seen dorsally (fig. 11) oblong-ovate in shape, greatest width not nearly attaining half the length and occurring about in the middle, anterior

extremity acuminate, posterior blunted. Valves rather thin and pellucid, slightly unequal, the left overlapping the right in front and partly also behind by a narrow hyaline border. Surface of shell smooth with only very slight traces of pilosity.

MALE (fig. 12) of nearly same size as female and scarcely differing in the shape of the shell. Sexual characters, however, easily observable in the dense coils of spermatie tubes occurring in the posterior part of each valve, and in the translucent ejaculatory tubes. The latter with numerous (up to 14) whorls of densely crowded chitinous stripes. Copulatory appendages of a similar structure to that in the male of *C. sinuata*, but with the terminal pieces distinctly bilobed.

Length of shell 0.60 mm., height 0.34 mm., width 0.24 mm.

Remarks.—This form, like *C. cunningtoni*, is undoubtedly a genuine *Cypridopsis*. It differs from that species, as also from the two African species described by Dr. Vávra and Dr. Müller, in the shape of the shell and in the imperfect pilosity of the same.

Occurrence.—Some few specimens of this form were found in a sample from Victoria Nyanza (269), taken 25/4/05 at Bukoba (W. shore of lake).

Genus 3. ZONOCYPRIS Müller.

Remarks.—This genus was established in the year 1898 by Dr. G. W. Müller to comprise two African species, *Z. madagascariensis* and *Z. elegans*, both of which were distinguished by a very peculiar sculpture of the shell, a character which has given rise to the generic name proposed by Dr. Müller. The genus is nearly allied to *Cypridopsis* or still more to *Pionocypris*, but differs in some points from both these genera, and can well be retained. Two species referable to this genus are described below.

23. ZONOCYPRIS COSTATA Vávra. (Plate LXXII. figs. 1-3.)

Cypridopsis costata Vávra, Die Süßwasser Ostracoden Deutsch-Ost-Afrikas, p. 10, figs. 1-8.

Syn.: *Zonocypris madagascariensis* Müller.

Specific Characters.—**FEMALE.** Shell very tumid; seen laterally (fig. 1) of a somewhat rhomboidal shape, greatest height occurring a little in front of the middle and slightly exceeding half the length, anterior extremity rounded, posterior obliquely truncated, dorsal margin forming a rather even curve, ventral margin slightly sinuated in the middle; seen dorsally (fig. 2) broadly oviform in shape, greatest width exceeding two-thirds of the length and occurring behind the middle, anterior extremity much narrower than posterior. Valves slightly unequal, the left overlapping the right somewhat along the anterior extremity, as also a little at the upper corner of the posterior one; anterior lips of both valves somewhat thickened, but with only slight trace of hairs. Surface of shell sculptured with very conspicuous elevated ridges arranged

in a concentric manner. Inferior antennæ rather coarsely built, with one of the terminal claws knife-shaped and denticulated along the inner edge (fig. 3). The other limbs resembling in structure those in *Cypridopsis*.

MALE of about same size as female, and exhibiting a very similar shape and sculpture of the shell.

Length of shell 0.60 mm., height 0.32 mm., width 0.39 mm.

Remarks.—I cannot see any essential difference between the form described by Dr. Müller as the type of this genus, *Z. madagascariensis*, and the form recorded by Dr. Vávra as *Cypridopsis costata*. Both these forms seem indeed to be identical, and as the specific name proposed by Dr. Vávra is the older one, it ought to be retained for the present species.

Occurrence.—Some few specimens of this form were found in a sample from Victoria Nyanza (269), taken 25/4/05 at Bukoba (W. shore of lake).

Distribution.—Ugogo, East Africa (*Vávra*), Madagascar (*Müller*).

24. ZONOCYPRIS LÆVIS, sp. n. (Plate LXXII. figs. 4-7.)

Specific Characters.—FEMALE. Shell very tumid; seen laterally (fig. 4) of a somewhat trigonal shape, greatest height occurring about in the middle and considerably exceeding half the length; anterior extremity somewhat obliquely rounded, posterior obliquely truncated below; dorsal margin forming in the middle an abrupt, almost angular curve, ventral margin rather deeply sinuated in the middle: seen dorsally (fig. 5) of regular oviform shape, greatest width equalling two-thirds of the length and occurring behind the middle, anterior extremity much narrower than the posterior. Valves rather thin and pellucid, nearly equal, and clothed at each extremity with delicate hairs. Surface of shell perfectly smooth, without any trace of the concentric ridges found in the preceding species. Muscular impressions in the centre of each valve (fig. 6) densely crowded and somewhat differing in form and arrangement from those in the two preceding genera. Inferior antennæ of much the same structure as in *Z. costata*, one of the apical claws exhibiting a very similar knife-like shape and coarse denticulation of the inner edge (fig. 7).

Length of shell 0.58 mm., height 0.33 mm., width 0.37 mm.

Remarks.—The above-described form is unquestionably congeneric with the preceding species, agreeing with it in all essential structural details. Yet it differs very conspicuously in even the character from which the present genus has been named, the surface of the shell being perfectly smooth, without the slightest trace of any sculpturing. The generic name proposed by Dr. Müller, of course, is somewhat inappropriate, since it does not apply to all the species.

Occurrence.—Some specimens of this form, most of them not in a good state of preservation, were found together with *Z. costata* in the above-mentioned sample from Victoria Nyanza.

Genus 4. STENOCYPRIS G. O. Sars.

Remarks.—The type of this genus is *S. malcolmsoni* Brady, of which a detailed description has been given by the present author from Australian specimens. The most prominent character distinguishing this genus is unquestionably the peculiar asymmetry of the caudal rami, the right one of which is much coarser than the left and armed along the dorsal edge with a comb-like series of strong denticles, wanting or only slightly indicated on the left ramus. This character is found in several other species recently described by Dr. Vávra and Dr. Müller, and may thus prove to be a very good generic criterion. The form recorded by the present author as *Stenocypris chevreuxi*, in which such an asymmetry does not exist, I am now inclined to refer to the genus *Herpetocypris*, in spite of the presence in this form of distinct, though very short natatory setæ on the inferior antennæ. In all other characters this form exhibits a much closer relationship to the genus *Herpetocypris* than to *Stenocypris*. A genuine species of the present genus is described below.

25. STENOCYPRIS PERARMATA Brady. (Plate LXXII. figs. 8–10.)

Stenocypris perarmata Brady, Entomostraca collected in Natal by Mr. J. Gibson, Proc. Zool. Soc. Lond. 1904; vol. ii. p. 126, pl. viii. figs. 50–57.

Specific Characters.—FEMALE. Shell much compressed; seen laterally (fig. 8) of elongated siliquose shape, greatest height occurring behind the middle and only slightly exceeding one-third of the length; anterior extremity somewhat obliquely rounded, posterior narrower and obtuse at the end, none of the extremities deflexed; dorsal margin gently curved, sloping evenly towards the anterior extremity, more steeply towards the posterior, above which there is trace of a slight concavity; ventral margin exhibiting in front of the middle a slight sinus bounded anteriorly (in the oral region) by a small convexity: seen dorsally (fig. 9) narrow oblong in form, with the greatest width only slightly exceeding one-quarter of the length, both extremities acuminate. Valves thin and pellucid, only slightly unequal, the left overlapping a little the right along the anterior extremity and also somewhat behind. Surface of shell smooth, but rather densely hairy both at the extremities and below. Caudal rami (fig. 10) exhibiting the structure characteristic of the genus; right ramus conspicuously broader than the left and armed on the distal part of the dorsal edge with a row of about eight coarse teeth, followed by a number of smaller and somewhat unequal denticles; dorsal edge of left ramus with only very small hair-like denticles in its outermost part; apical claws of both rami rather strong and somewhat unequal, the distal one being much the longer, though scarcely exceeding half the length of the ramus; both claws coarsely denticulated along the greater part of the concave edge, seta of

dorsal edge wanting, apical seta rather slender, extending almost as far as the distal claw.

Length of shell 1.48 mm., height 0.60 mm., width 0.41 mm.

Remarks.—I think I am right in identifying the present form with that described by Brady under the above name, though some small differences as to the shape of the shell may be found on comparing the figures here given with those reproduced by Prof. Brady.

Occurrence.—A nearly adult female specimen (that here figured) of this form had been mounted by Dr. Cunningham on a slide, together with some other Entomostraca. According to the label, they were derived from amongst algæ taken 23/6/04 in Nkata Bay on the west coast of Lake Nyasa. Another somewhat smaller specimen of the same species, likewise mounted, was found in Tanganyika, the exact locality not being stated.

Distribution.—Natal (*Brady*).

Genus 5. HETEROCYPRIS Claus.

Remarks.—According to Dr. Vávra, a genus with the above name was established by Claus in the year 1892, to include the well-known northern species, *Cypris incongruens* Ramdohr. Dr. Vávra considers this genus as constituting only a subsection of the genus *Cyprinotus* Brady. As, however, both these subsections are rather well defined and comprise at present each a number of species, I find it more appropriate to maintain the genus in Claus' form. A third closely allied genus is the one established by the present author as *Hemicypris*, to include *Cypris pyxidata* Moniez and allied species. The following species is only provisionally referred to the genus of Claus.

26. HETEROCYPRIS DUBIA, sp. n. (Plate LXXII. figs. 11-14.)

Specific Characters.—FEMALE. Shell somewhat compressed; seen laterally (fig. 11) of oval reniform shape, greatest height occurring behind the middle and exceeding half the length, anterior extremity narrowly rounded, posterior much broader and obtusely blunted; dorsal margin sloping with an even curve to the anterior extremity, abruptly deflexed behind, ventral margin somewhat convex behind and very slightly sinuated in front of the middle: seen dorsally (fig. 12) oblong-oval in form, greatest width equalling about two-fifths of the length and occurring in the middle, both extremities somewhat blunted. Valves very thin and pellucid, slightly unequal, the left one overlapping the right a little in front and also somewhat along the posterior half of the ventral face; lips of both valves perfectly smooth, without any trace of the crenulation found in other species of this and allied genera. Surface of shell smooth and clothed at both extremities with very delicate hairs. Muscular impressions in the centre of each valve (fig. 13) five in number and arranged in the usual manner

Caudal rami (fig. 14) rather narrow, nearly straight, and slightly tapering distally, dorsal edge perfectly smooth; apical claws of moderate size and somewhat unequal, the distal one the longer and about equalling in length half the ramus; dorsal seta shorter than the proximal claw and attached at only a short distance from it, apical seta very small.

Length of shell 0.86 mm., height 0.48 mm., width 0.36 mm.

Remarks.—In the shape of the shell, as seen laterally, this form looks rather like the African species described by Dr. Vávra as *Cyprinotus fossulatus*. It is, however, of smaller size and far less tumid, exhibiting, moreover, no trace of the impressed dots with which the surface of the shell in that species is sculptured, nor have I been enabled to detect any tubercles on the edges of the valves. In so far this form differs materially from any of the other known species. In the structure of the several appendages, however, as far as these could be examined in the solitary specimen found, no essential differences could be traced.

Occurrence.—A solitary female specimen of this form was found in a sample from Victoria Nyanza (250), taken 20/4/05 at Bukoba (W. shore of lake).

Genus 6. ILYOCYPRIS Brady.

Remarks.—Several northern species of this distinct genus have been described, and also an Australian species, *I. australis* G. O. Sars. In the Ostracod material from the Tanganyika Expedition two species of this genus are represented, though only by solitary specimens. I have been unable to identify either of them with previously described species.

27. ILYOCYPRIS PROPINQUA, sp. n. (Plate LXXIII, figs. 1-4.)

Specific Characters.—FEMALE. Shell moderately compressed; seen laterally (fig. 1) of oval reniform shape, greatest height occurring far in front and slightly exceeding half the length, anterior extremity broadly rounded, posterior narrower and obtusely truncated; dorsal margin nearly straight and obliquely sloping behind, forming with the posterior margin an obtuse angle, ventral margin deeply sinuated in the middle: seen dorsally (fig. 2) oblong-ovate in form, projecting on each side behind the middle to an obtuse protuberance, another smaller rounded prominence occurring on each side in front of the middle. Valves only slightly pellucid and somewhat unequal, the right overlapping the left in front by a narrow hyaline rim, and also somewhat along the posterior part of the ventral face. Surface of shell sculptured with densely crowded impressed dots and provided with scattered stiff hairs, more conspicuous at each extremity. Muscular impressions in the centre of each valve (fig. 3) densely crowded and somewhat differing in number and arrangement from those in the other genera. Caudal rami (fig. 4) rather narrow and conspicuously curved, dorsal edge smooth; apical claws rather slender

and somewhat unequal, the distal one being much the longer and considerably exceeding half the length of the ramus; seta of dorsal edge well developed.

Length of shell 0.94 mm., height 0.50 mm., width across the posterior protuberances 0.40 mm.

Remarks.—This form somewhat resembles the northern species *I. gibba* Ramdöhr, exhibiting a rather similar shape of the shell, which, as in that species, is produced on each side behind the middle to a well-marked protuberance; but these protuberances are in the present species considerably broader and more obtuse at the tip, more resembling those in the Chinese species *I. angulata* G. O. Sars. The structure of the caudal rami is also somewhat different.

Occurrence.—A solitary female specimen of this form was found in a sample from Lake Nyasa (8), taken 11/6/04 in Anchorage Bay. (S. end of lake).

28. *ILYOCYPRIS ALTA*, sp. n. (Plate LXXIII. figs. 5-7.)

Specific Characters.—*MALE.* Shell less compressed than in the preceding species, seen laterally (fig. 5) of a somewhat clavate shape, greatest height occurring far in front and exceeding three-fifths of the length, anterior extremity very broad and amply rounded, posterior much narrower and blunted at the end; dorsal margin forming in the ocular region an abrupt angular bend and sloping thence rather steeply behind, joining the posterior margin at an obtuse angle, ventral margin deeply sinuated in the middle: seen dorsally (fig. 6) of irregular oblong-ovate form, exhibiting, as in the preceding species, on each side in front of the middle a rounded tuberculiform prominence, and farther behind a broad obtuse protuberance, below which another somewhat smaller protuberance occurs. Valves rather thin and pellucid, conspicuously unequal, the right one overlapping the left in front by a rather broad hyaline rim, as also somewhat behind. Surface of shell less distinctly dotted and clothed with scattered delicate hairs. Caudal rami (fig. 7) comparatively shorter and stouter than in the preceding species and less curved, apical claws nearly equal in length, dorsal seta comparatively small.

Length of shell 0.80 mm., height 0.51 mm., width across the posterior protuberances 0.40 mm.

Remarks.—This form is unquestionably specifically distinct from the preceding one, differing rather conspicuously both from this and the other known species in the shape of the shell, as also in the structure of the caudal rami.

Occurrence.—Of this form also only a solitary specimen has come under my notice. It had been separated by Dr. Cunningham in a small tube, and proved, on a closer examination, to be a nearly adult male. According to the label it was found in a sample from Tanganyika (169) taken 18/11/04 at Kala (E. shore of lake).

Family CYTHERIDÆ.

Genus 7. LIMNICYTHERE Brady.

Remarks.—Of this genus, which exhibits so close a relationship to true marine Ostracoda, four or five northern species have been described, all of which are found exclusively in freshwater ponds or lakes. No species of this genus is, however, as yet known from the Southern Hemisphere. In the Ostracod material of the Tanganyika Expedition one species referable to this genus is represented, and another nearly related African species is known to me, having been found in a sample taken by Dr. Purcell from a freshwater pond in Cape Colony.

29. LIMNICYTHERE OBTUSATA, sp. n. (Plate LXXIII. figs. 8-14.)

Specific Characters.—FEMALE. Shell rather tumid; seen laterally (fig. 8) of regular oblong-oval shape, greatest height scarcely attaining half the length, both extremities obtusely rounded and of about same breadth; dorsal margin straight and horizontal, forming in front, just above the eye, an abrupt angular bend, ventral margin very slightly concave in front of the middle: seen dorsally (fig. 9) irregularly subovate in shape, being conspicuously constricted in front of the middle and bulging behind, greatest width almost attaining two-thirds of the length and occurring in the posterior part, anterior extremity acuminate, posterior blunted. Dorsal face of shell somewhat fornicate, ventral flattened, the greatest convexity of the shell occurring far below. Valves rather thin and flexible, being very little calcified and slightly unequal, the left valve overlapping the right a little in front, but scarcely behind. Surface of shell of a dull appearance, being distinctly reticulated, and clothed at both extremities with stiff hairs, more densely crowded along the anterior one. Muscular impressions in the centre of each valve (fig. 10) four in number and arranged in a regular vertical series. Eye single, not, as in the marine Cytheridæ, double. Superior antennæ (fig. 11) rather stout, being composed of six well-defined joints, the first two of which are much the largest and forming together a geniculate bend; setæ of the terminal part short, partly spiniform. Inferior antennæ (fig. 12) 4-articulate, without any trace of natatory setæ, but with a strong deflexed, biarticulate spine issuing from the end of the basal joint and extending beyond the apical claws, the latter comparatively short and only three in number. Mandibles and maxillæ of normal structure. The three pairs of legs (fig. 13) gradually increasing in length and of comparatively simple structure, each carrying on the end a strong claw, that of last pair, however, more slender. Caudal lobes (fig. 14) rather broad, and each provided with four thick and densely ciliated setæ.

Length of shell 0.60 mm., height 0.30 mm., width 0.38 mm.

Remarks.—This form differs conspicuously in the shape of the shell from any of the northern species, and more resembles in this

respect the South American form recently described by Dr. Daday as *Cypridinella ilosvagi*. The structure of the legs and the caudal lobes is, however, very different, and on the whole in accord with that found in the species of the present genus.

Occurrence.—Some few female specimens of this form, most of them not in a good state of preservation, were found in a sample from Victoria Nyanza (269), taken 25/4/05 at Bukoba (W. shore of lake).

GENERAL REMARKS.

The occurrence of Ostracoda in the samples taken by Dr. Cunningham during the Tanganyika Expedition must on the whole be regarded as a very unexpected circumstance, since these samples, as a rule, were all taken at the very surface by the aid of a fine-meshed tow-net. None of the known freshwater Ostracoda are, however, limnetic in habits, such as is the case with many of the Copepoda and Cladocera. They all are true bottom animals, though some of them are enabled, by the aid of the natatory setæ attached to the antennæ, to move freely in the water to some extent. The occurrence of specimens of this group in the samples may therefore be regarded as quite accidental, chiefly caused by the circumstance that in some cases the samples have been taken in quite shallow parts of the lakes, whereby some parcels of the bottom material have happened to be introduced in the tow-net*. The great number of species determined is still more perplexing and could easily lead to the wrong supposition that the Ostracod material procured was a very large and extensive one. This is, however, by no means the case. The material is in reality, as to quantity, very small, only one or two of the species being represented by a tolerably great number of individuals, all the others only by quite solitary specimens. Although the present account, therefore, in all probability, only gives a slight glimpse into the Ostracodous fauna of the three great Central African lakes, it will, I think, suffice to again emphasize the peculiar faunistic character of Lake Tanganyika, as compared with the other two lakes. A glance at the annexed table of distribution will show that the far greater number of species are derived from that lake, and the contrast between Tanganyika and the other two lakes is, in this case, even more striking than in the case of the Copepoda, no less than 22 species occurring in Tanganyika, whereas only three species are found in Lake Nyasa and five species in Victoria Nyanza. It will, moreover, be seen that at the same time only a single species, *Stenocypris perarmata*, occurs in two of the lakes (Tanganyika and Nyasa); in all other cases the species of the three lakes are different. Two

* Dr. Cunningham has recently called my attention to the fact that several of the samples, and in particular those which turned out to be most productive in Ostracoda, were taken during the night; and he has suggested that their occurrence in the surface-gatherings may more properly be explained by the very probable assumption that freshwater Ostracoda, like many marine bottom-crustacea, rise to the surface after dark.

Table of Distribution.

Names of Species.	Tanganyika.	Nyasa.	Victoria Nyanza.	Other parts of Africa.
<i>Paracypria declivis</i> G. O. S.	+			
" <i>complanata</i> G. O. S.	+			
" <i>conoidea</i> G. O. S.	+			
" <i>obtusa</i> G. O. S.	+			
" <i>deflexa</i> G. O. S.	+			
" <i>subangulata</i> G. O. S.	+			
" <i>reniformis</i> G. O. S.	+			
" <i>humilis</i> G. O. S.	+			
" <i>opaca</i> G. O. S.	+			
" <i>claviformis</i> G. O. S.	+			
" <i>flexuosa</i> G. O. S.	+			
" <i>curta</i> G. O. S.	+			
<i>Cypridopsis</i> <i>obliquata</i> G. O. S.	+			
" <i>sinuata</i> G. O. S.	+			
" <i>cunningtoni</i> G. O. S.		+		
" <i>pusilla</i> G. O. S.	+			
" <i>monodonta</i> G. O. S.	+			
" <i>serrata</i> G. O. S.	+			
" <i>bidentata</i> G. O. S.	+			
" <i>tumidula</i> G. O. S.	+			
" <i>congenera</i> G. O. S.	+			
" <i>gibba</i> G. O. S.			+	
<i>Zonocypris</i> <i>costata</i> Vávra			+	+
" <i>lævis</i> G. O. S.			+	
<i>Stenocypris</i> <i>perarmata</i> Brady	+	+		+
<i>Heterocypris</i> <i>dubia</i> G. O. S.			+	
<i>Ilyocypris</i> <i>propinqua</i> G. O. S.		+		
" <i>alta</i> G. O. S.	+			
<i>Limnocythere</i> <i>obtusata</i> G. O. S.			+	
29 species.	22	3	5	2

of the genera here recorded are especially richly represented in Lake Tanganyika, viz. *Paracypria* and *Cypridopsis*. Of the first-named genus no less than twelve different species have been determined, all exclusively peculiar to that lake and exhibiting a remarkable specialisation as regards the external appearance. The type of this genus, *P. tenuis* G. O. S., as mentioned above, was found in the very same brackish-water lagoon on the Chatham Islands from which the type of the Copepod genus *Schizopera* was derived. The suggestions set forth in my previous paper about the probable origin of the several species of the last-named genus occurring in Tanganyika may therefore also apply to those of the Ostracod genus here under question. As regards the other genus, *Cypridopsis*, it may be noted here that only two of the ten species determined exhibit all the characteristic features of that genus, and these two species do not occur in Tanganyika, one of them, *C. cunningtoni*, being derived from Lake Nyasa, the other, *C. gibba*, from Victoria Nyanza. The remaining eight species differ somewhat in the shape of the shell and the mutual

relation of the two valves, as also apparently in the structure of the ejaculatory tubes in the male, and should perhaps more properly be combined into a separate new genus, which, in such case, would be exclusively peculiar to Lake Tanganyika.

EXPLANATION OF THE PLATES.

PLATE LXIV.

Paracypria declivis G. O. Sars.

- Fig. 1. Adult female, viewed from right side.
 2. Same, dorsal view.
 3. Adult male, seen from left side.
 4. Anterior leg.
 5. Posterior leg.
 6. Caudal ramus.
 7. Palp of left posterior maxilla of male.
 8. Palp of right posterior maxilla of same.

Paracypria complanata G. O. Sars.

- Fig. 9. Adult male, viewed from right side.
 10. Same, dorsal view.

Paracypria conoidea G. O. Sars.

- Fig. 11. Adult male, viewed from right side.
 12. Same, dorsal view.

PLATE LXV.

Paracypria obtusa G. O. Sars.

- Fig. 1. Adult female, viewed from right side.
 2. Same, dorsal view.
 3. Adult male, viewed from left side.
 4. Piece of the central part of right valve, showing the finely striated sculpture of the shell and the group of muscular impressions.
 5. Superior antenna.
 6. Inferior antenna.
 7. Mandible and palp.
 8. Anterior maxilla with vibratory plate.
 9. Posterior maxilla.
 10. Anterior leg.
 11. Posterior leg.
 12. Caudal ramus.
 13. Inferior antenna of male.
 14. Palp of right posterior maxilla of same.
 15. Palp of left posterior maxilla of same.
 16. Copulatory appendage of same.
 17. Ejaculatory tube of same.

PLATE LXVI.

Paracypria deflexa G. O. Sars.

- Fig. 1. Adult female, viewed from right side.
 2. Same, dorsal view.
 3. Adult male, viewed from left side.
 4. Anterior lips of valves, viewed from right side.
 5. Piece of the central part of right valve, showing the muscular impressions.
 6. Caudal ramus.

Paracypria subangulata G. O. Sars.

- Fig. 7. Adult female, viewed from right side.
 8. Same, dorsal view.
 9. Adult male, viewed from left side.
 10. Anterior lips of valves, viewed from right side.
 11. Caudal ramus.

PLATE LXVII.

Paracypria reniformis G. O. Sars.

- Fig. 1. Adult female, viewed from right side.
 2. Same, dorsal view.
 3. Anterior leg.
 4. Caudal ramus.

Paracypria humilis G. O. Sars.

- Fig. 5. Adult female, viewed from right side.
 6. Same, dorsal view.
 7. Adult male, viewed from left side.
 8. Anterior leg.
 9. Caudal ramus.

Paracypria opaca G. O. Sars.

- Fig. 10. Adult female, viewed from right side.
 11. Same, dorsal view.
 12. Piece from the central part of right valve, showing the sculpture of the shell and the muscular impressions.
 13. Anterior lip of left valve, viewed from the inner side.
 14. Anterior leg.
 15. Caudal ramus.

PLATE LXVIII.

Paracypria claviformis G. O. Sars.

- Fig. 1. Adult female, viewed from right side.
 2. Same, dorsal view.
 3. Adult male, viewed from left side.
 4. Piece from the central part of right valve, showing the muscular impressions.
 5. Superior antenna.
 6. Inferior antenna.
 7. Anterior maxilla, without the vibratory plate.
 8. Anterior leg.
 9. Posterior leg.
 10. Caudal ramus.

Paracypria flexuosa G. O. Sars.

- Fig. 11. Adult female, viewed from left side.
 12. Same, dorsal view.
 13. Adult male, viewed from right side.
 14. Piece from the central part of right valve, showing the muscular impressions.
 15. Superior antenna.
 16. Anterior leg.
 17. Caudal ramus.

PLATE LXIX.

Cypridopsis obliquata G. O. Sars.

- Fig. 1. Adult female, viewed from right side.
 2. Same, dorsal view.
 3. Muscular impressions of right valve.
 4. Superior antenna.
 5. Inferior antenna.
 6. Mandible and palp.
 7. Anterior maxilla, without the vibratory plate.
 8. Anterior leg.
 9. Posterior leg.
 10. Caudal ramus.

Cypridopsis sinuata G. O. Sars.

- Fig. 11. Adult female, viewed from right side.
 12. Same, dorsal view.
 13. Adult male, viewed from left side.
 14. Inferior antenna of male.
 15. Palp of left posterior maxilla of same.
 16. Right posterior maxilla of same.
 17. Copulatory appendages of same.
 18. Ejaculatory tube.

PLATE LXX.

Cypridopsis cunningtoni G. O. Sars.

- Fig. 1. Adult female, viewed from right side.
 2. Same, dorsal view.
 3. Adult male, viewed from left side.

Cypridopsis pusilla G. O. Sars.

- Fig. 4. Adult female, viewed from right side.
 5. Same, dorsal view.
 6. Adult male, viewed from left side.

Cypridopsis monodonta G. O. Sars.

- Fig. 7. Adult male, viewed from right side.
 8. Same, dorsal view.
 9. Posterior corner of left valve, with the dentiform process.

Cypridopsis serrata G. O. Sars.

- Fig. 10. Adult female, viewed from right side.
 11. Same, dorsal view.
 12. Posterior extremity of shell, showing the peculiar marginal serrations of both valves.

PLATE LXXI.

Cypridopsis bidentata G. O. Sars.

- Fig. 1. Adult female, viewed from right side.
 2. Same, dorsal view.
 3. Posterior corner of left valve, with the two dentiform processes.

Cypridopsis tumidula G. O. Sars.

- Fig. 4. Adult female, viewed from right side.
 5. Same, dorsal view.
 6. Posterior extremity of shell, exhibiting the armature of both valves.

Cypridopsis congenera G. O. Sars.

- Fig. 7. Adult female, viewed from right side.
 8. Same, dorsal view.
 9. Adult male, viewed from left side.

Cypridopsis gibba G. O. Sars.

- Fig. 10. Adult female, viewed from right side.
 11. Same, dorsal view.
 12. Adult male, viewed from left side.

PLATE LXXII.

Zonocypris costata Vávra.

- Fig. 1. Adult female, viewed from right side.
 2. Same, dorsal view.
 3. Extremity of left inferior antenna, showing the peculiar structure of one of the apical claws.

Zonocypris lævis G. O. Sars.

- Fig. 4. Adult female, viewed from right side.
 5. Same, dorsal view.
 6. Muscular impressions of right valve.
 7. Extremity of left inferior antenna.

Stenocypris perarmata Brady.

- Fig. 8. Adult female, viewed from right side.
 9. Same, dorsal view.
 10. Caudal rami.

Heterocypris dubia G. O. Sars.

- Fig. 11. Adult female, viewed from right side.
 12. Same, dorsal view.
 13. Muscular impressions of right valve.
 14. Caudal ramus.

PLATE LXXIII.

Ilyocypris propinqua G. O. Sars.

- Fig. 1. Adult female, viewed from left side.
 2. Same, dorsal view.
 3. Muscular impressions of left valve.
 4. Caudal ramus.

Ilyocypris alta G. O. Sars.

- Fig. 5. Adult male, viewed from left side.
 6. Same, dorsal view.
 7. Caudal ramus.

Limnocythere obtusata G. O. Sars.

- Fig. 8. Adult female, viewed from right side.
 9. Same, dorsal view.
 10. Muscular impressions of right valve.
 11. Superior antenna.
 12. Inferior antenna.
 13. Right series of legs.
 14. Caudal lobe.

Paracypris curta G. O. Sars.

- Fig. 15. Adult male, viewed from right side.
 16. Same, dorsal view.
 17. Caudal ramus.

6. On *Tritylodon*, and on the Relationships of the
 Multituberculata. By R. BROOM, M.D., D.Sc., C.M.Z.S.

[Received March 14, 1910.]

(Text-figures 67 and 68.)

In 1884 Owen described, under the name *Tritylodon longævus*, a very remarkable imperfect skull submitted to him by Dr. Exton, of the Bloemfontein Museum. The specimen was stated to have come from "Thaba-chou, Basutoland," and was believed to be a Triassic mammal allied to the European *Stereognathus*. There is no locality known in Basutoland of the name Thaba-chou, but there are several mountains called Thaba-tsueu, and it is probably from one of these that the specimen came. In any case we now