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Scientific results of the Cambridge Expedition to the East African Lakes,
1930-1.—No. 16. The smaller Crustacea. By A. G. LOWNDES, M.A., F.L.S.

(With 5 Text-figures *)

[Read 12 November 1936]

INTRODUCTION.

The following paper represents the result of the identification of the species of Cladocera, Copepoda, and Ostracoda collected by Dr. Worthington.

Dr. Worthington has already published a general introduction and station list, so there is no necessity to describe this further. Altogether some seventy-six samples were examined, and the species which occurred in each were recorded. The complete list of these has been sent to Dr. Worthington, and it is not considered necessary to publish this here.

A complete list of the species recorded is given below, together with the list of species occurring in each lake or special piece of water. This is followed by a description of any new species found, together with a few general remarks about their occurrence when it is considered of interest.

The Crustacea examined were described by Dr. Worthington in his preliminary account as the 'Planktonic Crustacea', but the term is open to a certain amount of objection, and I have altered it after consulting the collector. The reason why the original description is objectionable is that many of the species are by no means really planktonic, for they are incapable of either floating or swimming, nor do they even have free-swimming larvae. Here I refer,

* The cost of reproducing these illustrations has been borne by the Westwood Fund.

in particular, to the Ostracods, many of which crawl along the bottom or attach themselves to water-plants. In general collections made with nets, such species will be found when collecting near the shore or among weeds, but they will not occur among the samples taken from open water. One rather curious feature is the entire lack of Harpacticids. These were searched for most carefully among all the samples, but none occurred.

In addition to the samples of plankton, I also received two samples of dried mud. These were placed in water and left for a considerable time, but unfortunately no Crustacea were obtained from them. A considerable amount of work has been done already on the Entomostraca of these East African Lakes, and in particular I would refer to the recent work of Miss P. M. Jenkin on the Rift Valley Lakes in Kenya in 1929. At the end of her paper Miss Jenkin has given such a complete list of references that it is felt that there is no necessity to repeat it or any part of it at the end of this paper.

In matters of nomenclature I have followed Miss Jenkin in the Cladocera, while in the Copepoda I have followed the nomenclature of Dr. Robert Gurney, given in his recent Ray Society Memoir. In the Ostracoda I have used that given by Sars in 'Crustacea of Norway', vol. ix.

In her recent paper Miss Jenkin has separated a large number of varieties of Cladocera, basing her diagnosis chiefly on measurement and ratios of the various parts. Miss Jenkin has had, of course, considerable experience of living Cladocera in the British Isles, and she was fully familiar with most of the species she was collecting, while she also had the great advantage of seeing any new varieties in the living state. I received preserved specimens only, and in some cases the preservative had completely evaporated, and I was only able to identify the species after they had been resoaked either in water or alcohol or dilute glycerine. Again, some of the material came from the stomach contents of fish. Under these circumstances I have felt that the separation into varieties is hardly possible, and hence in most cases the species alone is given.

I wish to express my gratitude to Dr. Worthington for the opportunity of working through this interesting collection.

List of species found.

CLADOCERA.

Diaphanosoma excisum Sars.
Hyalodaphnia barbata (Wetner) Daday.
Daphnia pulex (De Geer).
 — *longispina* O. F. Müller.
 — *galeata* Sars.
Simosa vetuloides (Sars).
Ceriodaphnia reticulata Jurine.
 — *laticaudata* P. E. Müller.
 — *rigaudi* Richard.
 — *dubia* Richard.

Ceriodaphnia cornuta Sars.
Moina dubia Guerne & Richard.
 — *brachiata* (Jurine).
Alonella punctata (Daday).
Pleuroxus aduncus (Jurine).
Chydorus sphaericus (O. F. Müller).

COPEPODA.

Paradiaptomus africanus Daday.
Metadiaptomus aethiopicus Daday.

Diaptomus newmanni C. van Douwe.
 — *banforanus* Kiefer.
 — *worthingtoni*, sp. n.
Cyclops albidus Jurine.
 — *leuckarti* Claus.
 — *hyalinus* Rehberg.
 — *gibsoni* Brady.

OSTRACODA.

Cypris connica, sp. n.
Heterocypris obliquus, sp. n.

Cyprinotus fossulatus Vávra.
Acocypris hyalina Lowndes.
Stenocypris curvirami Lowndes.
 — *icosacanthus* Lowndes.
 — *platybasis* Lowndes.
Zonocypris cordata Sars.
Oncocypris worthingtoni, sp. n.
Cypridopsis newtoni Brady & Robertson.
Cypretta tenuicaudata Vávra.
Cypridopsella worthingtoni, sp. n.
Centrocypris horrida Vávra.

Thus the number of species recorded was 38, and this number was made up as follows :—

Cladocera 16 species, of which none are indigenous to East or Central Africa, while 8 of the species are well known within the British Isles.

Copepoda 9 species, consisting of 5 species of Calanoida and 4 Cyclopida. The Calanoida are all confined to East or Central Africa, while of the 4 species of *Cyclops* three are well known within the British Isles, while one, *Cyclops gibsoni* Brady, is African, its range extending to South Africa.

Ostracoda 13 species, one of which only, *Cypridopsis newtoni*, has been recorded so far outside Africa.

Altogether 5 new species were recorded, consisting of 1 Calanoid and 4 Ostracods.

To the table given on p. 4 the following should be added :—

LAKE NAKAVALI	<i>Ceriodaphnia rigaudi</i> .
	<i>Moina dubia</i> .
	<i>Cyclops leuckarti</i> .
LAKE KACHIRA	<i>Ceriodaphnia rigaudi</i> .
	<i>Moina dubia</i> .
	<i>Cyclops hyalinus</i> .
LAKE KIJANEBALOLA	<i>Cyclops leuckarti</i> .
*BUJUKU POOL	<i>Chydorus sphaericus</i> .
*LAKE KIGERE : Fort Portal, Uganda	<i>Oncocypris worthingtoni</i> .
CRATER LAKE : 2 miles west of L. Naivasha	<i>Paradiaptomus africanus</i> .

GENERAL NOTES ON THE SPECIES.

Daphnia pulex.—This species occurred in Lake Bunyoni only. The form was without any sort of helmet or crest, and was identical with the common British or European species.

Daphnia longispina and *Daphnia galeata*.—Whether these two forms constitute two distinct species or one species and one variety, is of course a vexed problem,

* Samples collected by G. L. R. Hancock.

TABLE SHOWING DISTRIBUTION OF SPECIES.

	L. Naivasba.	L. Beringo.	L. Rudolph.	L. Edward.	L. George.	L. Bunyoni.
CLADOCERA.						
<i>Diaphanosoma excisum</i>	..	×	×	..	..	×
<i>Hyalodaphnia barbata</i>	..	×	×	..	..	×
<i>Daphnia pulex</i>	..	..	..	..	..	×
— <i>longispina</i>	×	..	..	×	..	..
— <i>galeata</i>	×	×	..	..	..	..
<i>Simosa vetuloides</i>	×	..	..	..	×	×
<i>Ceriodaphnia reticulata</i>	..	..	..	×	..	×
— <i>laticaudata</i>	..	..	×	..	..	..
— <i>rigaudi</i>	×	×	×	..	×	..
— <i>dubia</i>	..	..	..	×	..	..
— <i>cornuta</i>	..	×	..	×	×	..
<i>Moina dubia</i>	×	×	..	×	×	..
— <i>brachiata</i>	..	..	×	..	..	×
<i>Alonella punctata</i>	×	..	..	..	..	..
<i>Pleurozous aduncus</i>	..	..	..	..	..	×
<i>Chydorus sphaericus</i>	..	..	..	..	×	..
COPEPODA.						
<i>Metadiaptomus aethiopicus</i>	..	..	..	..	..	×
<i>Diaptomus newmanni</i>	..	×	..	..	..	..
— <i>banforamus</i>	×	..	×	..	..	..
— <i>worthingtoni</i>	..	..	..	..	×	..
<i>Cyclops albidus</i>	..	..	..	..	×	×
— <i>leuckarti</i>	×	×	×	×	×	×
— <i>hyalinus</i>	×	×	×	×	×	×
— <i>gibsoni</i>	..	..	..	×	..	..
OSTRACODA.						
<i>Cypris connica</i>	..	..	..	..	×	..
<i>Heterocypris obliquus</i>	..	..	..	..	×	..
<i>Cyprinotus fossulatus</i>	..	..	..	..	×	..
<i>Acocypris hyalina</i>	..	..	..	..	..	×
<i>Stenocypris curvirami</i>	..	..	..	..	..	×
— <i>icosacanthus</i>	..	..	..	..	..	×
— <i>platybasis</i>	×	..	..	..	..	..
<i>Zonocypris cordata</i>	×	..	..	..	..	..
<i>Oncocypris worthingtoni</i>	..	..	×	..	×	..
<i>Cypridopsis newtoni</i>	..	..	..	..	×	×
<i>Cypridopsis tenuicaudata</i>	..	..	..	..	×	..
<i>Cypridopsella worthingtoni</i>	..	..	×	..	..	..
<i>Centrocypris horrida</i>	..	..	..	..	×	..

and I do not propose to enter into it here. Practically all forms occur abundantly in the Cambridge area, and the problem is one that can only be solved by careful series of breeding experiments. In Lake Naivasha the helmeted form, which I have recorded as *D. galeata* occurs abundantly, together with the non-helmeted form.

In one sample representing the stomach contents of a fish, *Tilapia nigra*, caught among water-weeds near the east of the lake, large quantities of *Daphnia* were present, but these were of the non-helmeted form only. No species of *Daphnia* is recorded from Lake Naivasha by Miss Jenkin, which is rather surprising.

PARADIPTOMUS Sars, 1895.

Gurney in his recent Ray Society Monograph has discussed fully both the classification of Calanoida in general and also the subdivision of the Diaptomidae, and I have no hesitation in following him. More recently Kiefer (1932) has made an independent classification of the Diaptomidae, and, although Gurney's work is referred to in the bibliography, it seems to have been entirely disregarded in the actual context. There is, I believe, a further reason for following Gurney's classification, since he places a considerable amount of weight on the structure of maxillipedes. In 1925 Storch and Pfisterer put forward their well-known filter-feeding theory for *Diaptomus gracilis*, and it seems to have been assumed generally that the Calanoida are in general filter-feeders, the animals feeding automatically as they swim through the water and filtering out the minute microscopic organisms. On this theory they show no marked power of food selection.

In a recent paper (Lowndes, 1935) I have described the feeding of nine species of Calanoids, both marine and freshwater, and have come to quite a different conclusion. I have, I believe, given direct evidence that in most cases, if not in all, the feeding is highly selective, while both the maxillae and maxillipedes are prehensile organs and their filtratory action is secondary. One has only to examine the maxillipedes of *Paradiaptomus africanus* (fig. 1, E) and see how they differ from those of *Diaptomus gracilis* to realise that the feeding is hardly likely to be the same, and it must surely be conceded that one has here a logical basis for generic or subgeneric separation.

Gurney's diagnosis of the genus *Paradiaptomus* is as follows:—'Female abdomen of 2 somites (3 in *P. greeni*); furcal rami of male more or less asymmetrical; prehensile antennule with finger or hook-like process on last segment; exopod of antenna sometimes shorter than endopod; maxillipede with 2 terminal segments reduced, the whole appendage very stout; leg 1 with two outer spines on exopod 3; leg 2 without cuticular lobe; leg 5 of female with exopod 3 reduced to a movable spine; leg 5 of male much modified in adult.'

TYPE, *P. falcifer* (Lovén).

PARADIAPTOMUS AFRICANUS Daday.*Diaptomus africanus* Daday, 1910.*Paradiaptomus biramata* Lowndes, 1930.*Description of adult female.*

Length 3.1–3.4 mm.

The body is not particularly elongated or slender, the greatest width being about one-third the length and occurring about the middle.

The cephalic segment is somewhat pointed in front, while at the posterior end the body tapers slightly.

The last two segments are fused and the distal extremities of the last segment show some asymmetry. The left corner is more extended than the right and possesses three rounded stumps of spines, while the other corner bears two stumps only, and these are even less spine-like (fig. 1, A). There are no rostral projections.

The tail consists of two segments only, of which the first, the genital segment, is rather longer than the next. The genital segment is also dilated in front and shows a rounded bulge on the right side, with a much more pointed bulge on the left. The genital segment bears a spine on either side, but these are not conspicuous in preserved specimens (fig. 1, A).

The caudal rami are slightly longer than broad and are practically symmetrical. Their inner edges are covered with hairs, while the caudal setae are of normal appearance, though rather stout and densely plumose. On the dorsal surface of both the anal segment and the caudal rami there are some small spines, reminding one of the spines in the males, but in the female specimens they are much less conspicuous. The antennules are made up of 25 segments, and bear several long setae. The integument of these setae has a mottled or scaly appearance, as shown in the diagram (fig. 1, B, B', & B"). None of the setae are plumose, however.

The antennae possess the same structure as those of the type-species. The mandibles are powerfully developed. Their structure is shown in the diagram (fig. 1, C).

The maxillules are of a normal but complicated structure. The spines on the pre-coxa are stout and plumose. The coxa bears six long and three shorter setae, which are not plumose. The exopodite bears seven plumose setae, while the endopodite consists of two segments (fig. 1, D).

The maxillae are strongly built, and their structure is almost identical with that of the type-species, except that the limb is if anything stouter. All the lobes are armed with strong curved spines in addition to the setae. There can hardly be any question that the limb is prehensile, and it is difficult to see how it could play the part of a filter for small particles.

The structure of the maxillipedes is shown in the diagram (fig. 1, E). Sars, in describing those of the type-species, states that 'The posterior maxillipedes are highly distinguished by their extraordinarily strong development, being

almost three times as long as the anterior ones, and constituting very powerful preying organs'. In the present species they are rather more slender, but there can be no question of their being anything but prehensile organs.

The structure of the first swimming foot is shown in the diagram (fig. 1, F). There is no spine on the outer edge of the second joint of the outer ramus, but there are two on the outer edge of the terminal joint.

The fifth foot is quite different from that of the type-species. The outer ramus consists of three segments. The first is without spines or setae, while the second segment bears an inner serrated claw and an outer spine. The third segment ends in two unequal spines (fig. 2, A). The inner ramus consists of two segments and is somewhat shorter than the first segment of the outer ramus. It is lobed at the tip and bears two longer spines and several others which are much smaller.

Description of adult male.

Length is a little less than that of the female.

The body is rather more elongated with the last two segments partly fused. The outer corners of the last segment are less extended than in the female. The right corner is more angular than the left one and bears two small but well-defined spines. The left corner also bears two spines, but these are almost minute.

The tail consists of five somites. The first is rather asymmetrical and extends slightly more to the right than to the left, and its inner corner bears a small spine.

On the sides and on the dorsal surface of each of the other tail-somites is a small spine.

The caudal rami are only slightly longer than broad and slightly asymmetrical. Each ramus bears right in the middle of its dorsal surface a spinule.

The right antennule is, of course, strongly modified, as shown in the diagram (fig. 1, H & H'). The distal portion consists of three segments only, of which the last bears a hook-like process.

The mouth-parts and the first four pairs of swimming feet are identical with those of the female.

The fifth foot is, of course, quite different. There are two well-defined basal segments, the second segment of the right foot being broader and longer than that of the left. The outer ramus of the right foot consists of two segments. The first segment is about as long as it is broad and bears no spine, but at its inner distal corner there is a conspicuous knob. The second segment is rather inflated and bears distally a finely serrated claw and a much smaller spine. The inner ramus consists of two segments, but it does not extend to the end of the first segment of the outer ramus. The second segment consists of a curious knob-like process.

The *left foot* is also biramous. The inner ramus consists of a single segment ending in two small spines. The outer ramus consists of three segments,

FIG. 1.—*Paradiaptomus africanus* Daday.

- A. Last cephalic segment and abdomen of female. Seen dorsally.
 B & B'. Antennule. Female.
 B''. Integument of setae under high power.
 C. Mandible.
 D. Maxillule. *p.c.*, pre-coxa; *c.*, coxa; *b.*, basis; *ex.*, exopodite; *en.* 1 & 2, endopodite.
 (Setae on *ex.* and *en.* omitted.)
 E. Maxillipede.
 F. First swimming foot.
 G. Second swimming foot.
 H & H'. Antennule. Male.

FIG. 2.—*Paradiaptomus africanus* Daday.

A. Fifth foot, female.

B. Fifth foot, male.

Metadiaptomus aethiopicus Daday.

C. Abdomen of male.

D. Maxillipede.

E. First swimming foot.

F. Last two segments of the antennule of the male.

G. Fifth foot, male.

G'. Fifth foot of male seen from the under side.

H. Last two thoracic somites and abdomen, female.

K. Fifth foot, female.

Diaptomus newmanni C. v. Douwe.

L. Maxillipede.

but division of the second and third is obscure. The inner edge of the first segment is provided with hairs and at least one marked lobed process (fig. 2, B).

The second segment is also hairy and lobed. It bears a stout claw on its outer edge. The claw is provided with a number of rows of spinules throughout its entire length.

The third segment consists of a small knob bearing a spine. This spine appears to be very much reduced in some specimens.

Occurrence.

A large number of specimens occurred in a sample taken from a crater-lake near Lake Naivasha. No other species of entomostracan occurred in the sample. Mr. L. C. Beadle (1932) investigated the nature of the water of this lake and has recorded its alkalinity and pH value, &c. The alkalinity is very high, and it is evident that the nature of the water differs widely from that of the typical freshwater pond. Mr. Beadle recorded that the zooplankton consisted of a large number of *Diaptomus*; no other organisms were found.

Remarks.

In a recent publication Kiefer (1932) has pointed out that *Paradiaptomus biramata* Lowndes is really the same species as *Diaptomus africanus* Daday. In my original description I illustrated the species chiefly by photomicrographs, and at a first glance it seems difficult to believe that my photographs and Daday's drawings of such features as the caudal rami, in both sexes, are representatives of the same thing, but in spite of this I consider that Kiefer was right and my species should be withdrawn. This raises another interesting point, for Daday records the species from several stations in what was then German East Africa, including Lake Nyasa, where the water is perfectly fresh and the species occurs in association with such well-established freshwater species of Entomostraca as *Cyclops prasinus*, *Cyclops macrurus*, *Chydorus sphaericus*, and *Bosmina longirostris*, &c., while Daday records it from Rikwa-See in the same district, where it occurs in association with *Cyclops macrurus*, *C. prasinus*, *C. Leuckarti*, and *C. hyalinus*, together with several well-established species of freshwater Cladocera. In Abyssinia it occurred in large quantities in Hora Keloli, which is a small crater-lake with the following remarkable chemical composition :—

Parts per 100,000.	
Suspended matter	65
Soluble matter	676
Chlorine	54
Calcium	1.8
Magnesium	3.0
Sodium	205
Carbon dioxide	300

The only other species of entomostracan occurring in Hora Keloli were *Cyclops gibsoni* and *Cyprinotus rostrata*.

So far, then, the ecologist has the following problem before him. A large distinctive, if not abnormal, species indigenous to East Africa and Abyssinia, capable of living in perfectly freshwater areas associated with well-known freshwater species of Entomostraca, or equally capable of living in small strongly alkaline crater-lakes, where it is almost the only entomostracan occupant.

METADIAPTOMUS Methuen, 1910.

Gurney's diagnosis of the genus *Metadiaptomus* is as follows :—'Female abdomen of 3 somites (4 in *M. chevreuxi*) ; furcal rami of male generally more or less asymmetrical ; prehensile antennule with finger or hook-like process on last segment ; exopod of antenna longer than endopod ; maxillipede as in *Diaptomus* ; leg 1 with 2 outer spines on exopod 3 ; leg 2 with or without cuticular lobe ; leg 5 as in *Paradiaptomus*.'

TYPE, *M. transvaalensis* Methuen.

METADIAPTOMUS AETHIOPICUS Daday.

Description of adult female.

Length 1.24 mm.

The body is elongated, the length of the thorax being 0.84 mm. with a greatest width of 0.32 mm. The fifth thoracic somite is not distinctly separated nor is it expanded laterally. It is symmetrical as shown in the diagram (fig. 2, H).

The abdomen consists of three somites. The genital somite is considerably longer than the second and third somites combined. It is very little expanded at its base and practically symmetrical.

The caudal rami are symmetrical. The antennules do not reach beyond the base of the caudal rami.

Fifth foot.—There is no conspicuous spine on the basal segment. The endopodite consists of one segment only, and it is slightly shorter than the first segment of the exopodite. Terminally it bears two long setae and one much shorter and smaller one.

The first segment of the exopodite is elongated. The second segment bears a strong claw carrying a number of very coarse teeth. There is also one conspicuous tooth at the base of the claw, and a well-developed spine on the outer corner of this segment (fig. 2, K). The third segment is well defined and bears a single stout spine.

The terminal segment of the outer ramus of the first foot bears two spines on its outer edge. The terminal spine on the same segment is replaced by a seta (fig. 2, E).

Adult male.

Length 1.0 mm.

The abdomen consists of five somites, the last two being slightly asymmetrical, as shown in the diagram (fig. 2, C).

The right antennule is modified in the usual manner and consists of 21 segments. The last segment ends in what might be called a terminal hook (fig. 2, F).

Fifth foot (fig. 2, G).—The coxa is extended to form a blunt process on the right inner corner. The basis of the right foot is short and dilated on its inner edge forming a cushion-like structure beset with numerous spinules. The first segment of the exopodite is rather short and bears on its inner corner a conspicuous finger-like process which apparently acts in apposition with the endopodite.

The second segment of the exopodite is long and slender, bearing a stout terminal claw and also a short spine on its outer corner.

The endopodite consists of a single segment, but bears terminally a cushion-shaped process.

The basis of the left foot is short, while the adjoining somite is much modified, as shown in the diagram (fig. 2, G').

Remarks.

I think there can be no doubt that the specimens observed and described belong to the species described by Daday, though they differ in several points. Thus Daday describes somite 5 of the female as being asymmetrical. His figure of leg 5 of the female is also rather different, but the structure of leg 5 of the male is so characteristic that there can be little real doubt.

Occurrence.

Numerous specimens occurred in samples from Lake Bunyoni, but up to the present the species has been recorded from East Africa only.

DIAPTOMUS Westwood.

Gurney's diagnosis of the genus *Diaptomus* is as follows :—'Female abdomen of 3 somites (occasionally of 2); furcal rami generally symmetrical in both sexes. Exopod of antenna longer than endopod; maxillipede slender, the 5 terminal segments well developed; exopod of leg 1 with one outer spine on seg. 3; leg 2 with cuticular lobe on posterior face of endopod 2; leg 5 of female usually with seg. 3 of exopod well defined.'

TYPE, *D. castor* (Jurine).

DIAPTOMUS NEWMANNI C. v. Douwe.

This species has been fully described and figured by van Douwe, with the exception of the maxilla and maxillipede and the first swimming foot. The exopodite of the antenna is much longer than the endopodite. The maxilla is typical and hardly requires illustrating. It is quite short, but the setae are long and fine.

The sympod of the maxillipede consists of three clearly defined somites, while the endopod consists of at least 5 distinct somites including the basal

one, which indicates a partial separation into two (fig. 2, L). The endopodite is short, and there is no suspicion of any of its setae being replaced by claws.

The terminal segment of the exopodite of the first swimming foot bears one spine only, while the second segment bears none.

So far the species has not been recorded except from East Africa. Numerous specimens occurred in the samples from Lake Baringo, while I had previously recorded it from Lake Naivasha, though it did not occur among the samples collected from that lake during the present expedition.

DIAPTOMUS BANFORANUS Kiefer.

Syn. *Trophodiaptomus banforanus* Kiefer.

The species was originally described (without illustrations) by Kiefer from West Africa. It belongs to the *orientalis* group and is closely allied to *D. kraepelini* Poppe & Mrázek, but it differs in the following points :—

The last cephalothoracic somite is practically symmetrical in both sexes. The species is smaller, the length of the adult female being 1.2, while that of the male is 1.1 mm.

The structure of the fifth foot in both male and female is rather different, as shown in the diagrams (fig. 4, E, E', G, G').

The endopod of the maxillipede consists of six somites in the present species, while there are only five in *D. kraepelini*. The setae on the maxillipede are short (fig. 4, D).

Numerous specimens of both sexes occurred in samples from Lake Naivasha and Lake George.

DIAPTOMUS WORTHINGTONI, sp. n.

Adult female.

Length 2.3–2.4 mm.

Seen dorsally the cephalothorax is elongated. The last somite is hardly at all expanded and is not separated from the preceding somite. It is practically symmetrical with a small spine at each corner. The abdomen consists of two somites only. The genital somite is stout and almost as broad as it is long. It is also practically symmetrical, and rather longer than the anal somite with the caudal rami (fig. 3, A).

Seen laterally the rostrum is quite short. The large genital somite appears to be divided (fig. 3, B & C).

The antennules reach to the tips of the caudal rami. The maxillipedes are of normal structure with an endopod of five somites. The endopod is considerably shorter than the sympod (fig. 3, D).

Fifth foot (fig. 3, F, F', F'').—The coxa bears the usual stout spine. The basis is typical in structure and bears a fine seta on its outer edge. The endopodite is single-jointed and is as long as the first segment of the exopodite. Terminally it carries two rather unequal spines, which are both slightly bent. At the base of the larger spine there are two spinules and a ring of hairs.

FIG. 3.—*Diaptomus worthingtoni*, sp. n.

- A. Last thoracic somite and abdomen of female.
- B. Rostrum of female.
- C. Side-view of last thoracic somite and abdomen, female.
- D. Maxillipede.
- E. First swimming foot.
- F. Fifth foot. Female.
- F'. Tip of endopodite.
- F''. Tip of exopodite.
- G. Abdomen of male.
- H. Fifth foot, male.
- H'. Tip of left fifth foot of male, enlarged,
- K. Right antennule, male.

The first somite of the exopodite is stout and nearly as long as it is broad. The claw on the second exopodite is stout and curved and appears free from teeth except under the higher powers of the microscope. The third somite of the exopodite is not separated from the second. It bears one short and fine spine and one much longer one. The longer is not quite as long as the claw of the second exopodite (fig. 3, F").

The first swimming foot is of normal structure, bearing a single spine on the outer edge of the third segment of the outer ramus (fig. 3, E).

Adult male.

Length 2.3 mm.

The body is elongated with the last cephalic somite slightly asymmetrical. The first somite of the abdomen is distinctly asymmetrical, while the fourth somite is bent towards the right. The right antennule is modified in the usual way with curved spines on segments 10, 11, 13, and 15, none of which are unusually large. There is a hooked process on the last segment but two (fig. 3, K).

Fifth foot (fig. 3, H).—There is a stout spine on both the right and left coxa.

Right foot.—The basis is stout and bears a very coarse spine at its inner basal corner. The endopodite is represented by a rounded stump not separated from the basis. Segment 1 of the exopodite is quite short, while so is segment 2. The spine on its outer edge is longer than the segment itself, and it is smooth. The claw is bent and only very finely serrated.

Left foot.—This does not reach beyond the tip of the first endopod somite of the right foot. The basis is stout. The endopodite is not clearly separated off. It consists of a stump crowned by a ring of spinules. The exopodite clearly consists of two segments. On the inner edge there is a membranous flap with a serrated edge. There are also two lobes each bearing a finger-like process bearing spinules (fig. 3, H').

Colour.—The antennules and caudal rami in both sexes are of a conspicuous dark blue, even in the preserved specimens. The blue colour disappears entirely when the animal is boiled in dilute potash.

In general appearance and also in colour the species is clearly related to *Diaptomus orientalis*, and it is to be described as one of the *orientalis* group.

Numerous specimens of both sexes occurred in samples from Lake George.

CYCLOPS LEUCKARTI Claus.

Gurney in his preface to vol. iii. of his Ray Society Monograph makes the following statement: 'It seems, broadly speaking, that there are relatively few "major species" of *Cyclops*, most of which are found in Europe, and that round each can be gathered satellites, which one can designate as species only at the peril of losing grasp of reality', and no better illustration of this could be found than in the present species. The species is almost unique and is certainly distinct from any closely related species by one rather remarkable characteristic, the absence of a spine or seta on the inner corner of the basis of the first swimming foot. During the working out of this collection special

attention was paid to this point, since it seems to give a very clear limitation to this particular species.

Quite recently I had an opportunity of looking through a very large collection from Brazil, and, since I was concerned with the genus *Cyclops* alone, I had every opportunity of paying close attention to the point in question. The *leuckarti* group was very largely represented, but a critical examination convinced me that while *Cyclops leuckarti* occurs throughout Africa, it is absent from Brazil and also Paraguay, and I very much doubt if this species has ever been recorded from South America. It is most unfortunate that the absence of this particular spine has escaped the notice of nearly all taxonomists working on the group, and hence numerous records of the species have been given for South America. Gurney, with due regard to the absence of this spine, has recorded the species from many parts of the world, while I have recorded it from Abyssinia and the New Hebrides. Gurney regards the species as cosmopolitan, with the possible exception of South America. Numerous specimens occurred at all the stations except Lake Kachira.

CYCLOPS HYALINUS Rehberg.

Gurney regards *Cyclops hyalinus* Rehberg and *Cyclops* (*Mesocyclops*) *crassus* Sars and also *Cyclops oithonoides* Sars as one and the same species. If this is so, one must include *Cyclops neglectus* Sars and also *Cyclops* (*Thermocyclops*) *infrequens* Kiefer under the same name. Personally I should always have regarded *Mesocyclops crassus* Sars as a perfectly good species. Gurney has, however, gone into the matter fully, and, in the absence of breeding experiments, I follow him. In my preliminary investigation of the material of this collection I separated these species and recorded the three following: *Cyclops neglectus* Sars, *Cyclops crassus* (Fischer), and *Cyclops infrequens* Kiefer. However, all three forms occur so frequently in one and the same sample taken from the same station that it seems that the separation is of no ecological importance at any rate. In this case *Cyclops hyalinus* is recorded from all stations and is the most abundant species of Copepod present.

CYCLOPS GIBSONI Brady.

Syn. *Cyclops nubicus* Chappuis, Rev. Suis. Zool. t. 29, 1922.

Cyclops longistylis Brady, Ann. Trop. Med. vol. iv, 1910, p. 242.

Afrocyclus gibsoni Sars, Ann. South African Museum, 1926, part iii, Copepoda.

Leptocyclops gibsoni Lowndes, Proc. Zool. Soc. 1930, no. xi. p. 171.

Eucyclops gibsoni Kiefer, Das Tierreich, 2. Cyclopoida Gnathostoma, Berlin, 1929.

I recorded this interesting species from Abyssinia, where it occurred in association with *Paradiaptomus africanus* from Hora Keloli. It would be interesting if the two had still been associated in the present collection, but apparently this is not so.

The species occurred in small quantities in the one station only, Lake Edward.

CYPRIS O. Fr. Müller, 1776.

CYPRIS CONNICA, sp. n.

Female.

Length 2 mm., breadth 1·8 mm., height 1·2 mm.

Seen dorsally, the animal has a somewhat characteristic appearance. The outer edges of the valves are rounded, but rather sharply pointed in front. At the posterior end the valves bear some conspicuous spines, of which the two largest are placed symmetrically as shown in the figure (fig. 4, H). The lateral edges are greatly extended, but there is no suggestion of a separate flange or rim. The valves are practically symmetrical. The surface of the valves is practically smooth, but covered all over with short hairs.

Seen from the anterior or posterior end, the outline is conical in appearance (fig. 4, K).

Seen from the inside, the valves are not very dissimilar, except that the anterior flange on the right valve is broader than that of the left (fig. 4, L & M). Neither end of either valve is denticulate.

Appendages.

On examining these separately and comparing them with Sars's figures for *Cypris pubera* O. Fr. Müller, I am unable to find any essential differences.

The species is closely related to *Cypris inflata* Daday or *Cypris (Eurycypris) neumanni* G. W. Müller, but differs from both in the proportions of height to length, &c.

Several specimens (female only) occurred in samples from Lake George.

HETEROCYPRIS Claus, 1892.

HETEROCYPRIS OBLIQUUS, sp. n.

Female.

Length 1·5 mm., height 0·90 mm., breadth 0·88 mm.

Seen dorsally the anterior end appears bluntly pointed. The left valve overlaps the right to a marked degree, bending the setae of the antennules to the right almost at right angles. The dorsal suture is practically straight, and at the posterior end the valves are symmetrical. The position of greatest breadth lies rather towards the posterior end (fig. 4, O). Seen from the ventral side there is a decided flattening of that surface.

Seen laterally the upper margins of the valves appear evenly rounded, the position of greatest height being in the centre (fig. 5, A). Seen from the anterior or posterior end the valves appear at once to be asymmetrically arranged. The left valve is at a lower plane than the right (fig. 4, P).

The inner duplicatures of both valves are quite narrow. The left valve bears a rather conspicuous hyaline margin, without tubercles, while the edge of the right valve bears conspicuous tubercles (fig. 4, Q) at both ends. These are less conspicuous towards the middle of the ventral edge, but they are none the less there.

FIG. 4.—*Diaptomus banforanus* Kiefer.

- A. Last thoracic somite of female.
- B. Last two thoracic somites of male.
- C. Last two abdominal somites and caudal rami of male.
- D. Maxillipede.
- E. Fifth foot of female.
- E'. Another view of the same appendage.
- F. Right antennule of male.
- G. Fifth foot of male.
- G'. Another view of the right foot of the same appendage.

EXPLANATION OF FIG. 4 (*cont.*).*Cypris connica*, sp. n.

- H. Dorsal view.
- K. Anterior view.
- L. Right valve, seen from the inside.
- M. Left valve, seen from the inside.

Heterocypris obliquus, sp. n.

- O. Female. Dorsal view.
 - P. Anterior view. *r*, right valve; *l*, left valve.
 - Q. Edge of the right valve at the posterior corner.
 - R. Antenna.
 - S. Caudal rami.
 - S'. Caudal rami, showing variation.
-

Appendages.

The antennules are of normal structure, but the antennae are peculiar in that the claws on the last two segments are exceptionally long, being at least twice the combined length of the two segments themselves (fig. 4, R).

The other appendages are of normal structure, except for the caudal rami. These are elongated and bent somewhat. The dorsal edge is very finely serrated. The claws are long, the longer being more than half the length of the ramus. They are finely serrated and the longer claw is expanded at its mid-point (fig. 4, S). A curious variation is prevalent in this species. It takes the form of a spinous process on the ventral edge of the rami, and it occurs in addition to the normal claws and setae. The first three specimens dissected all showed this variation, which appeared symmetrically on both rami (fig. 4, S').

Male.

In general appearance and shape of the valves, the two sexes are alike except in size. The males are smaller, the length not exceeding 1.25 mm. with a height of 0.75 mm.

In the limbs the usual modifications occur. The prehensile palps of the maxillipedes are markedly dissimilar. The propodus of the left palp is crowned with a number of rounded processes (fig. 5, C). The shape of the right palp is shown in fig. 5, D.

The ejaculatory tubes consist of a large number of whorls and are elongated.

The oblique nature of the valves distinguished this species from any other in the genus. Several specimens of either sex occurred in samples from Lake George.

CYPRINOTUS FOSSULATUS Vávra.

This is a well-known East African species first described by Vávra from Zanzibar. It has also been recorded by Daday from German East Africa, and requires no further description here. Several specimens of both sexes were obtained from Lake George.

ACOCYPRIS Vávra, 1894.

The genus was first described by Vávra from Zanzibar, and it has been recognised by all subsequent authors.

According to Vávra the genus is closely related to the genus *Stenocypris* G. O. Sars, but is at once distinguished by the structure of the caudal rami. In both genera the dorsal seta is missing, but while in *Stenocypris* the rami are always asymmetrical, in *Acocypris* they are always symmetrical.

Up to the present there are only two species recognised: *A. capillata* Vávra, which occurs in East Africa, Zanzibar, and Madagascar, while the second species, *A. hyalina* Lowndes, was first described from Abyssinia, but has since been recorded from the Rift Valley Lakes of Kenya by Klie.

A third species, *A. uegitia* Masi has also been recorded from Italian Somaliland, but the species should be removed to the genus *Stenocypris*.

ACOCYPRIS *HYALINA* Lowndes.

The species has been described and figured in 'A small Collection of Entomostraca from Uganda, collected by Mr. G. L. R. Hancock (Lowndes, 1931)', while it has also been recorded and further described by Klie (1929) from the Rift Valley Lakes of Kenya. A few specimens occurred in a sample from Lake Bunyoni.

STENOCYPRIS G. O. Sars, 1889.

The genus was established by G. O. Sars in 1889 to comprise an Ostracod (*S. malcolmsoni*) raised by him from dried Australian mud, and previously recorded by Baird, and also by Brady, from India. In recent times a number of species have been added, but it is very doubtful whether they all belong to the same genus. According to Sars the chief generic characteristic is the marked asymmetrical nature of the caudal rami coupled with the absence of the dorsal seta.

The caudal rami also bear numerous teeth along their dorsal edge. These teeth may be very long or quite short and fine, usually divided into a number of groups.

The second antenna may or may not bear long swimming-setae, but, so far as is known, no species is able to swim or to support itself in any way.

The shape and general appearance of the valves are very varied, but typically the animals are elongated with the height less than half the length.

In its shape the genus approaches the well-known genus *Herpetocypris* Brady & Norman, and agrees with it in the presence or absence of long swimming-setae on the second antennae coupled with a general inability to swim. Moreover, the latter genus shows a marked tendency to produce asymmetrical caudal rami, but the asymmetry is quite different in the two genera, and in *Herpetocypris* the dorsal seta is never absent.

STENOCYPRIS *CURVIRAMI* Lowndes.

A few specimens were obtained from samples from Lake Bunyoni. Previously the species had been recorded from Abyssinia only.

STENOCYPRIS ICOSACANTHUS Lowndes.

Several specimens of this large species were recorded from Lake Bunyoni. Previously the species had been recorded from Uganda.

Stenocypris fascigera G. O. Sars, recorded from South-West Africa, closely approaches the present species, but there is considerable difference in the shape of the valves, and I think there is little doubt that the two are distinct species.

STENOCYPRIS PLATYBASIS Lowndes.

A few specimens of this species were obtained from Lake Naivasha. It was first recorded from Abyssinia (Lowndes, 1932).

ZONOCYPRIS G. W. Müller, 1898.

Generic characters.—Shell with a peculiar sculpture. The right valve bears along its inner edge a row of tubercles, both at the posterior and anterior end. These tubercles may be right at the edge or close to it.

The antennae are short and stout, the penultimate segment has two very strong, short, and thick claws, one of which is toothed, while the other is not. This last segment bears very fine claws and setae. In the male the penultimate segment bears two very long and fine claws.

The first masticatory process of the maxilla with two spines bearing teeth. The last segment of the second foot bears a hook-like process. Furca rudimentary, lash-shaped, with or without a small bristle on the hinder dorsal edge. Usually small forms, not more than 0.75 mm. long.

The genus was established by G. W. Müller in 1898 to include two species from Madagascar—*Z. madagascarensis* and *Z. elegans*. In the same paper Müller (1898) transferred a species named by Vávra (1897) *Cypridopsis costata* to this genus, thus making three species. Then Sars (1910) in describing the Ostracoda from Tanganyika amalgamated *Zonocypris costata* Vávra with *Z. madagascarensis* Müller, and described a new and, therefore, a third species, *Z. laevis*.

Müller in Ostracoda in 'Das Tierreich', 1912, makes no reference to Sars's Tanganyika paper, and still treats *Z. madagascarensis* and *Z. costata* as separate species.

Klie, in 1933, in describing the Ostracods of the Rift Valley Lakes of Kenya, collected by Miss P. M. Jenkin, reviewed the matter carefully, and after examining a very large number of specimens came to the conclusion that Sars's amalgamation of the two species *Z. costata* and *Z. madagascarensis* was correct.

Müller, in 1908, added another species from South Africa to the genus, *Z. tuberosa*, and in 1924 Sars again recorded this species from the Cape Province. In the same paper Sars added another species, *Z. cordata* to the genus.

In 1932 ('Ostracoda from Abyssinia', Lowndes, 1932) I pointed out that Daday's species *Oncocypris costata* must be referred to the present genus, and, since the specific name of *costata* was already occupied, I renamed it *Zonocypris dadayi*.

Finally, Klie (1935) named another species *Zonocypris laevigata* from French West Africa.

The genus then consists of the seven following species, all of which are confined to Southern and Tropical Africa and Madagascar :—

Zonocypris cordata G. O. Sars. Cape Province.

— *costata* Vávra. (Syn. *Zonocypris madagascarensis* G. W. Müller.)
Madagascar and East Africa.

— *dadayi* Daday. (Syn. *Oncocypris costata* Daday.) German East Africa.

— *elegans* G. W. Müller. Madagascar.

— *laevigata* Klie. French West Africa.

— *laevis* G. O. Sars. Cape Province.

— *tuberosa* G. W. Müller. South Africa.

ZONOCYPRIS CORDATA Sars.

The species has been fully described and illustrated by Sars (1924), and requires no further description here. A few specimens were obtained from Lake Naivasha.

ONCOCYPRIS G. W. Müller, 1898.

Generic characteristics.—Shell more or less globular, but extended in front into a keel or rostrum. The valves are asymmetrical and bent over to the right. Both the width and height exceed two-thirds of the length in each of the two sexes. Eye double. Shell covered all over with pimples and depressions. Edges of the valves strongly marginate and of a rather characteristic structure.

Swimming-setae of the second antenna are well developed.

First masticatory process of the maxilla with at least four toothed spines. Vibratory plate of the maxilliped quite rudimentary. It may be absent altogether or replaced by two setae. Last joint of the second foot quite short and bearing two unequal setae and one spine, but no hooked process. Furca rudimentary. Ejaculatory duct of the male with about 16 to 20 whorls of spines.

Remarks.—I have recently discussed this genus fully (Lowndes, 1932), and I have nothing further to add.

ONCOCYPRIS WORTHINGTONI, sp. n.

Female.

Length 0.64 mm., width 0.62 mm., height 0.44 mm.

Seen laterally the dorsal margin appears evenly rounded. The greatest height is about equal to two-thirds the length, and the highest point is about in the centre. The ventral margin is indented, and the base of the animal is slightly hollowed out.

Seen dorsally the animal has a broad triangular shape with a fairly well-marked angle between the lateral and posterior surfaces. The position of the line of greatest width occurs well towards the posterior end (fig. 5, E).

The anterior end is not bent towards either side, though the left valve slightly overlaps the right.

Towards the posterior end the valves are symmetrical.

The eye is double with the further extremities well separated. The dorsal suture is broad and irregular, since the valves are thickened at their margins.

Towards the anterior end there is a conspicuous groove on either side of the eye-region.

The integument is beset with conspicuous rounded protuberances and depressions, and these, again, consist of a series of much smaller protuberances, giving the animal a very characteristic appearance.

The colour is rather dark and horny.

Hairs appear to be confined to the inner margins of the valves. Seen from the inside the valves are very strongly marginate. The anterior edge of the valves bears a marked hyaline border. If the right valve is placed flat on the slide the hyaline border will be seen to be devoid of any tessellated structure such as appears in the closely related species *O. omer-cooperi* (fig. 5, F).

Appendages.

Antennules.—The terminal part consists of five segments. The first is twice the length of the others, which are all subequal. The setae are long.

Antennae.—The penultimate segment is clearly divided. The claws of the last two segments are very long, and the swimming-setae reach well beyond their tips.

The Mandibles are well developed, but the palp consists of three segments only, the second and third being united or at any rate not clearly separated. The second segment bears a tongue-shaped lamellar plate covered with short setae.

The terminal segment is short and broad and bears terminally three stout spines and two setae. The lamellar process is well developed and bears four long plumose setae and two rather shorter ones (fig. 5, G).

Maxillae.—The palp is not elongated, but the terminal segment is rather elongated and tapers distally.

Maxillipede.—The vibratory plate is absent and not represented by setae. The palp is definitely curved at the tip.

First foot.—This is five-segmented. The second segment is very large and swollen. The claw on the terminal segment is exceptionally long and curved (fig. 5, H).

Second foot.—The terminal segment bears two setae and one curved spine. The longer of the two setae is not as long as the penultimate segment. The penultimate segment is subdivided and bears a spine on its inner surface (fig. 5, K).

Caudal rami.—These are greatly reduced and are identical with those of *O. omer-cooperi*. They bear a long flagellum on the end of a clearly defined and jointed base.

FIG. 5.—*Heterocypris obliquus*, sp. n.

- A. Female. Lateral view.
- B. Last two segments of the second foot.
- C. Male. Left prehensile palp of maxillipede.
- D. Right palp.

EXPLANATION OF FIG 5 (cont.).

Oncocypria worthingtoni, sp. n.

- E. Female seen dorsally.
- F. Anterior edge of the right valve of the female, seen from the inside.
- G. Lamellar process of the mandibular palp.
- H. First foot.
- K. Last three segments of second foot.
- L. Male seen dorsally.
- M. Right prehensile palp of maxillipede, male.
- N. Left palp.
- O. O. Anterior view of female.
- P. Anterior view of female *Oncocypria omer-cooperi* for comparison.

Cypridopsella worthingtoni, sp. n.

- Q. Left valve seen from the inside.
- R. Right valve seen from the inside.
- S. Palp of maxilla.
- T. Male. Left prehensile palp of maxillipede.
- U. Right palp.

Male.

The males are smaller and slightly different in shape (fig. 5, L).

Length 0.6 mm., width 0.52 mm., height 0.42 mm.

Seen dorsally the animals are less angular in outline, while the position of greatest width is rather further forward. The integument is identical with that of the female. All the appendages with the exception of the usual modification of the maxillipedes are identical with those of the female. This particularly includes the penultimate joint of the posterior antenna, which is clearly divided.

Maxillipedes.—The prehensile palps are markedly dissimilar. They are distinct from those of *O. voeltzkowi* and *O. omer-cooperi*, but Daday does not figure them for *O. mülleri*.

The propodus of the right palp (fig. 5, M) is short and stout with its distal end expanded. The elongated thumb-like process of *O. omer-cooperi* is missing. The dactylus is broad and dome-shaped. The propodus of the left palp (fig. 5, N) is much more elongated, while the dactylus is stout and thumb-like. The ejaculatory tubes contain 18 whorls.

Remarks.

The species is closely related to *O. omer-cooperi*, but it differs in several respects. It is at once distinguished if it is observed from either the anterior or posterior end. The present species is flattened in outline, while that of *O. omer-cooperi* is rounded (fig. 5, P).

A large number of specimens of both sexes were obtained from Lake Rudolph, Lake George, and Lake Kigezi.

CYPRIDOPSIS Brady, 1866.

Remarks.

This genus was established by Brady in 1866, and was originally intended to include all the Cyprids with rudimentary lash-shaped caudal rami. Later workers have restricted the name more and more, and it is here used in the restricted sense given by G. O. Sars in 'Crustacea of Norway', vol. ix, 1928.

CYPRIDOPSIS NEWTONI Brady & Roberts, 1870.

Syn. *Candonella newtoni* Vávra, 1898.

Cypridopsis aldabrae Müller, 1898.

Candonella albida Vávra, 1900.

Potamocypris aldabrae Daday, 1910.

The fullest description of the species is that given by Müller (1898), the vibratory plate of the maxillipede consisting of three setae in the female and only two in the male. The right prehensile palp in the male consists of a short propodus with a heavy curved dactylar process, while the left palp consists of an elongated propodus and a somewhat reduced dactylar process.

The species has been recorded from Europe, North Asia, North America, The Azores, Madagascar, East Africa, and Ceylon.

A large number of specimens of both sexes occurred in sample 220 of the present collection. They were attached to wood from the muddy shore west of Lake Rudolf.

CYPRIDOPSELLA Kaufmann, 1900.

The generic characters of *Cypridopsella* have been discussed in detail by Sars in 'Crustacea of Norway', vol. ix, 1928. He gives the following :—

Generic characters.—Shell much compressed, more or less reniform in shape and densely hairy. Valves very unequal, the right overlapping the left more or less conspicuously along the dorsal face. Antennae well adapted for swimming. Maxillae with the masticatory lobes short and stout, palp rather large, with the distal joint spatulate in shape, and armed at the end with coarse spines. Vibratory plate of maxillipeds quite rudimentary. Anterior legs rather slender. Caudal rami of a structure similar to that in the two preceding genera. Genital lobes of female provided in front with a peculiar hooked process.

Remarks.—This genus was proposed in the year 1900 by Kaufmann, and as its type was considered *Monoculus villosus* of Jurine, which by most recent authors had been referred to the genus *Cypridopsis* Brady. Kaufmann, however, included in that genus two other species which evidently are not congeneric, and which have been described above as members of the genus *Pionocypris*. The present genus is in particular distinguished by the very asymmetrical valves and by the structure of the maxillae. From the genus *Potamocypris* Brady it differs essentially by the well-developed natatory setae on the

posterior antennae. In addition to the typical species described below, *Cypridopsis smaragdina* Vávra and *Potamocypris maculata* Alm are apparently referable to the present genus.

Klie, 1925 and 1930, does not restrict the name *Potamocypris* to those species in which the setae of the antenna are somewhat reduced, but neither can I find any reference to Sars's latest work.

Whether the length of the swimming setae is or is not a variable characteristic in species referred by various authors to the genus *Potamocypris* is a point which can only be decided by means of breeding experiments.

As the result of breeding experiments on the genus *Herpetocypris*, I have come to the conclusion that this characteristic shows no signs of variation and therefore I feel that Sars's objection to extending the use of Brady's generic name must be upheld.

To the three species given by Sars for the present genus, one must add Klie's species, *Potamocypris hummelincki* and the species described below.

CYPRIDOPSELLA WORTHINGTONI, sp. n.

Female.

Length 0.5 mm., height 0.3 mm., width 0.2 mm.

Seen dorsally the outline is elliptical, though distinctly compressed, slightly pointed towards the anterior end.

Seen laterally the valves are distinctly dissimilar.

The right valve is higher than the left and overlaps it along the dorsal edge. The dorsal edge of this valve is evenly rounded with its highest point slightly towards the anterior end. The anterior end is considerably blunter than the posterior, but both ends are distinctly rounded. The ventral margin is flat.

The left valve is rounded at the anterior end, but angular at the posterior. At both ends the valves bear a hyaline margin (fig. 5, Q & R).

The surface of the shell is practically smooth and devoid of setae, while the shell itself is light in colour and somewhat transparent. The structure of the limbs appears to be typical.

The setae on the antennae are well developed and reach well beyond the claws. The claws themselves are long.

The maxillae bear a palp which is distinctly short and broad even for the genus, while the spines are also short and broad (fig. 5, S).

The spines on the outermost masticatory lobe are smooth, but broad. The vibratory plate of the maxillipedes is replaced by two fairly long setae. The caudal rami and the other appendages are typical.

The males are fairly common and differ little in appearance and size from the females.

The prehensile palps of the maxillipedes are rather dissimilar as shown in the figures (fig. 5, T & U). The ejaculatory tubes are short, but contain none the less about fifteen whorls.

Occurrence.

The species occurred in two samples from Lake Rudolf, one sample, no. 247, containing nothing else.

Diagnosis.

The species is readily recognised by its small size and by the peculiar structure of the maxillary palp.

CYPRETTA TENUICAUDATA Vávra.

This is a well-known species and requires no further description. True, the genus is a very difficult one and it has received a great deal of attention lately (chiefly from Klie). However, since it is not a question of referring new species to an ill-defined genus, it is hardly thought profitable to enter into a long discussion and revision of the genus here.

A few specimens were obtained from Lake George. The species was first described from Zanzibar by Vávra, 1895.

CENTROCYPRIIS HORRIDA Vávra.

The genus comprises two species only and is quite well defined. The present species has been recorded from Zanzibar by Vávra, 1895. Several specimens, both male and female, were obtained from Lake George.

REFERENCES.

Miss P. M. Jenkin's paper on the Cladocera of the Rift Valley Lakes in Kenya (1934) includes a very full list of references. These were made primarily for the Cladocera, but the list includes many references to the Copepoda and Ostracoda. A few further references, chiefly relating to the Ostracoda are added.

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