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With the Author's compliments

46

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CLARE ISLAND SURVEY

PART 46

FRESH-WATER ENTOMOSTRACA

BY

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FRESH-WATER ENTOMOSTRACA.

By D. J. SCOURFIELD, F.Z.S., F.R.M.S.

PLATE I.

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THE collections forming the basis of the present report were made for the most part in Clare Island, in the north-eastern part of Achill Island, and in the immediate neighbourhood of Westport, though a few were also obtained from Castlebar and Islandeady Loughs and some others from the district on the southern side of Clew Bay as far inland as Doo Lough. All the localities are situated, therefore, either in Clare Island or within 10 miles of the shores of Clew Bay, and this may be considered as the area covered by the Survey so far as fresh-water Entomostraca are concerned.

No previous collections of fresh-water Entomostraca had apparently been made in Clare Island itself, and very little had been done in the country surrounding Clew Bay. In 1868 Brady and Robertson (**9**) visited Westport, and recorded a few Cladocera and Ostracoda, among these being a new species, *Limnicythere sancti-patricii*, obtained from Lough Moher, and the rare *Monospilus dispar*. Canon Norman visited Westport in 1874, but only the Ostracoda obtained on that occasion seem to have been recorded (**20**). Mr. Kane also visited the district prior to 1909, and recorded the remarkable *Holopedium gibberum* from L. Keel, Achill (**19**), while Messrs. W. & G. S. West made collections of phyto-plankton in two lakes in Achill in 1904, and incidentally refer to the presence of certain Entomostraca (**24**).

Much more attention had been given to the district to the south, embracing Connemara and Loughs Corrib and Mask, and a considerable number of species from this area are to be found in the papers and notes by Andrews, Norman, Brady, Kane, West, and others. Nevertheless the records are very imperfect even for this district, owing mainly to the fact that no attempt has hitherto been made to compile a complete list of species, including the commoner as well as the rarer forms.

Most of the collections dealt with in this paper were made in June, 1909, either by the writer or by Mr. Kane. Later in the same year, and again in 1910 and 1911, Mr. Kane collected in the same area, and small gatherings were also made by Mr. James Murray (March, 1911), and Mr. J. S. Dunkerly (April, 1911). I wish to express my thanks to these gentlemen for the

trouble they have taken in this matter, and especially to Mr. Kane, who has rendered invaluable help in many ways in the preparation of this paper.

As regards the methods of collection employed, it may be mentioned that, in addition to the gatherings made with various kinds of nets, some attention was given to washing wet mosses from bogs, mountain torrents, &c., and by this means a few species were obtained which were not found in any other way. A certain amount of bottom material was also passed through fine sieves; but it was not found possible to employ this method as frequently as could have been wished. Generally speaking, the collections were obtained from quite small pieces of water, such as bog-pools, peat-cuttings, ponds, and small lakes. The only lakes of any size investigated were Castlebar Lough, Islandeady Lough, and Doo Lough; and it is much to be regretted that no collections could be obtained from the two largest lakes in the district, viz., Loughs Feeagh and Beltra.

The total number of species now recorded for the district is 90, including three recorded by Brady and Robertson, one found by Mr. Kane, and one given by Canon Norman, but not found again during the progress of the present investigation. The species are distributed among the three Orders as follows:—Cladocera 48, Copepoda 26, and Ostracoda 16. The majority of the species are fairly common types in the British Isles, being either generally distributed or abundant in particular localities. One, however, a species of Copepod from Clare Island, herein described as *Canthocamptus* (*Attheyella* ?) *praegeri* appears to be new to science, and there are a few others which may be specially mentioned on account of their rarity in the British records, e.g., *Latona setifera*, *Ceriodaphnia affinis*, *Alona intermedia* (in the British Isles hitherto recorded only from Scotland), *Rhynchotalona falcata*, *Alonella exigua*, and *Cyclops rubellus*.

The following species are recorded for Ireland for the first time:—

CLADOCERA:—Latona setifera.
Ceriodaphnia affinis.
Acroperus angustatus.
Alona intermedia
Alonella exigua.

COPEPODA:— Eurytemora velox.
Cyclops languidus.
nanus.
vernalis.
bisetosus.
bicolor.
rubellus.
varicans.
Cyclops affinis.
Canthocamptus lucidulus.
crassus.
pygmaeus.
zschokkei.
praegeri n.sp.
hirticornis.
Nitocra spinipes.

OSTRACODA:—Cypris obliqua ?

A number of slight variations from the typical forms have been noted, some of which are referred to under the notes on the species, but nothing apparently of real importance, except in one specimen from Clare Island of what seems to be *Canthocamptus hirticornis.* In this case the furca and their setae, as shown on Plate I, fig. 10, are completely changed from the usual type to something unlike what is found in any known species. It may be merely an example of malformation, although, as the structures are perfectly symmetrical, it more probably represents a distinct mutation.

A comparison of the Entomostracan faunas of the different sections of the area comprised in the Survey brings out a number of interesting facts. Considering first the relation of Clare Island to the country around Clew Bay, we find that whereas the total number of species of the Cladocera recorded from the island is only about one-half the number from the mainland, the number of Copepoda is very nearly the same, and the number of Ostracods about two-thirds. The actual figures are as follows:—

	Cladocera.	Copepoda.	Ostracoda.	Total.
Clare Island, ...	24	19	10	53
Mainland (including Achill),	48	21	15	84

The Clare Island fauna is mainly noticeable, as perhaps was to have been expected, for negative rather than positive characters. It is true that a few species have been obtained there which have not hitherto been found in the mainland area (e.g. *Cyclops bisetosus, Canthocamptus hirticornis, C. praegeri,* n. sp., *Nitocra spinipes,* and *Cypris obliqua* ?), but these, with the exception of the new species, about which nothing can be said, may be confidently expected to occur on the mainland also. On the other hand, there are some rather remarkable absences from the Clare Island list, viz., Diaphanosoma, Bosmina, Alonopsis, and Polyphemus. It seems almost impossible to imagine that these absences can be without significance, as representatives of the genera mentioned are fairly common on the mainland. What the significance may be is not known, but it may be surmised to be connected with the means of dispersal.

The Achill Island list contains the following species which have not been noticed in other parts of the area covered by the survey:—*Latona setifera, Holopedium gibberum, Ilyocryptus sordidus, Cyclops nanus, Limnicythere inopinata.* As none of these, however, can be considered as common species, it is not possible to draw any inferences from their presence in Achill and apparent absence elsewhere. The absence of *Simocephalus vetulus,* a very common species in all parts of the country, is rather surprising, but may be only accidental.

The Westport-Castlebar list shows the following characteristic species:—*Ceriodaphnia pulchella, C. affinis, Bosmina longirostris, Pleuroxus trigonellus,*

Monospilus dispar, *Cyclops bicolor*, *C. varicans*, *Canthocamptus lucidulus*, *Notodromas monacha*, *Ilyocypris bradyi*, *Limnicythere sancti-patricii*, and *Cytheridea torosa*. The first and third named at least may be considered as typical "lowland" species, for they are rarely if ever found in mountainous and moorland districts, and, taken in connexion with the other species enumerated and the rarity of such forms as *Acantholeberis curvirostris* and *Alonopsis elongata*, clearly indicate the influence of the different physical conditions of this district as compared with the others.

The Louisburgh-Croaghpatrick list exhibits the following peculiarities:—*Diaphanosoma brachyurum* var. *nasuta*, *Daphnia hyalina* var. *galeata*, *Simocephalus exspinosus*, *Ceriodaphnia reticulata*, and *Bosmina longicornis*. I am indebted to Mr. Kane for all the records from this district except those from Croaghpatrick itself. The species recorded from the latter mountain are as follows:—*Acantholeberis curvirostris*, *Alona rustica*, *Chydorus sphaericus*, *Cyclops viridis*, *C. fuscus*, *C. prasinus*, and *Canthocamptus zschokkei*. These I obtained by collecting in bog-pools at various heights up to about 1500 feet, and by washing mosses taken from the sides of the small streams. *Acantholeberis curvirostris*, *Chydorus sphaericus*, and *Cyclops prasinus* were characteristic of the former, *Alona rustica* and *Canthocamptus zschokkei* of the latter. Mr. Kane's collections were made about Louisburgh, and as far west as Roonah Lough, and as far south as Doo Lough. The Copepoda and Ostracoda were only partially studied.

Taking the district worked over by the Survey as a whole and comparing it, so far as the imperfect records allow, with the rest of the counties of Mayo and Galway, the most noticeable differences are to be found in the absence from the former of a number of typically plankton species of Cladocera and Copepoda (e.g. *Bosmina coregoni*, Bythotrephes, Leptodora, *Diaptomus laticeps*, &c.) and a considerable number of Ostracods. The explanation of the missing plankton forms is almost certainly to be found in the fact that the larger lakes of the survey area were not examined, while the larger number of Ostracods in the list from the remainder of Mayo and Galway is accounted for by the attention devoted to this group, especially in Connemara, by such well-known authorities as Brady, Robertson, and Norman.

Combining the survey results with the records from the other parts of Mayo and Galway, we obtain for the first time in Ireland a list from a fairly large and compact area (practically the "West of Ireland" *par excellence*) showing some signs of approaching completeness. The total of 115 species compares not very unfavourably with the numbers recorded from some much more thoroughly worked districts in England and Scotland, and considerably

exceeds the total yet recorded from Wales. It only falls short of the complete Irish list by about twenty-eight species.[1]

In addition to the species recorded in this paper for the first time for Ireland, the Mayo-Galway list comprises quite a number of forms which have not hitherto been seen in other parts of Ireland, but little or no importance can be attached to this at present, owing to the fragmentary nature of the records outside the two counties named.[2] It contains three species, *Diaptomus sancti-patricii*, *Canthocamptus praegeri*, n. sp., and *Cypridopsella picta* (the first-named, however, only doubtfully distinct from *D. laciniatus*), which have not been found elsewhere in the British Isles. It also includes two species, *Alona rectangula* and *Candona stagnalis* (or three species if we consider *Diaptomus sancti-patricii* as only a variety of *D. laciniatus*) and one variety, *Diaphanosoma brachyurum* var. *nasuta*, which have also been found in Scotland, but nowhere else in the British Isles. With the English list it has five species in common which have not yet been found in Scotland, viz. *Acroperus angustatus*, *Cyclops oithonoides*, *C. rubellus*, *Cypridopsella obesa*, and *Metacypris cordata*. On the other hand, the Mayo-Galway list, as well as the complete Irish list, contains no representative of the *Daphnia magna* group, nor of the genera Moina and Moraria, and naturally a number of individual species from several other genera are also absent.

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[1] In view of the subsequent remarks on distribution the names of these additional Irish species may be usefully given here:—

CLADOCERA.

Daphnia cucullata.
Ceriodaphina laticaudata.
Macrothrix laticornis.
Alona tenuicaudis.
Leydigia acanthocercoides.
Pleuroxus laevis.
aduncus.
Anchistropus emarginatus.
Bythotrephes cederströmii.

COPEPODA.

Diaptomus castor. *
Cyclops leuckarti.
phaleratus.
aequoreus.
Argulus foliaceus.

OSTRACODA.

Cypris pubera.
virens.
affinis.
bispinosa.
Herpetocypris tumefacta.
Ilyodromas olivaceus.
robertsoni.
Cypridopsella variegata.
Candona angulata.
elongata.
lactea.
compressa.
fragilis.
Cytheridea lacustris.

[2] It is very much to be desired that good lists of Entomostraca from various districts in Ireland should be obtained in the near future. I would suggest that attention should be paid particularly to the north-west, south-west, and east or south-east.

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* NOTE.—The records of *Diaptomus graciloides* by W. and G. S. West (24) are probably incorrect, as this species as defined by Schmeil has never been seen in the British Isles.

LIST OF FRESH-WATER ENTOMOSTRACA from Clare Island and the Clew Bay District, together with the species recorded from the remaining parts of Mayo and Galway.

[NOTE.—The figures in the first four columns, except the totals which refer to the number of species, indicate the number of separate stations where the species have been found, and consequently give a rough idea of the relative commonness or rarity of the forms.]

SPECIES.	Clare Island.	CLEW BAY DISTRICT.			Rest of Mayo and Galway.
		Achill Island.	Westport and Castlebar.	Louisburgh and Croagh-patrick.	
Total number of stations,	21	15	14	9	—
CLADOCERA.					
SIDIDAE.					
Sida crystallina (O. F. M.),	1	2	3	2	×
Diaphanosoma brachyurum (Liévin),	—	4	2	1	×
nasuta, Kane,	—	—	—	1	×
leuchtenbergianum, Fischer,	—	—	—	—	×
Latona setifera (O. F. M.),	—	1	—	—	—
HOLOPEDIDAE.					
Holopedium gibberum, Zaddach,	—	1	—	—	×
DAPHNIDAE.					
Daphnia pulex (De Geer),	—	—	—	—	×
obtusa, Kurz; propinqua, Sars,	—	1	—	—	—
var.,	—	1	—	—	—
longispina, O. F. M.,	1	—	3	—	×
hyalina, Leydig, s. str.,	—	—	1	—	—
lacustris, Sars,	1	1	1	—	×
galeata, Sars,	—	—	—	1	×
Scapholeberis mucronata (O. F. M.),	—	—	3	1	×
Simocephalus vetulus (O. F. M.),	7	—	3	1	×
exspinosus (Koch),	—	—	—	1	×
Ceriodaphnia reticulata, Jurine,	—	—	—	1	—
megalops, Sars,	—	—	—	—	×
quadrangula (O. F. M.),	6	3	3	—	×
pulchella, Sars,	—	—	1	—	—
affinis, Lilljeborg,	—	—	1	—	—
BOSMINIDAE.					
Bosmina longirostris (O. F. M.),	—	—	1	—	—
obtusirostris, Sars,	—	4	1	—	×
longicornis, Schoedler,	—	—	—	2	—
longispina, Leydig,	—	—	—	—	?
coregoni, Baird; mixta, Lillj.,	—	—	—	—	×
LYNCODAPHNIDAE.					
Ilyocryptus sordidus (Liévin),	—	1	—	—	—
Macrothrix rosea (Jurine),	—	—	—	—	×
Lathonura rectirostris (O. F. M.),	—	—	—	—	×

LIST OF FRESH-WATER ENTOMOSTRACA—*continued.*

SPECIES.	Clare Island.	CLEW BAY DISTRICT.			Rest of Mayo and Galway.
		Achill Island.	Westport and Castlebar.	Louisburgh and Croagh-patrick.	
Total number of stations, .	**21**	**15**	**14**	**9**	—
LYNCODAPHNIDAE—*continued.*					
Streblocerus serricaudatus (Fischer),	—	2	1	1	×
Drepanothrix dentata (Eurén), .	2	2	—	—	×
Acantholeberis curvirostris (O. F. M.),	3	7	1	3	×
LYNCEIDAE.					
Eurycercus lamellatus (O. F. M.), .	6	2	5	1	×
Camptocercus rectirostris, Schoedler,	—	—	—	—	×
Acroperus harpae, Baird, . .	7	1	5	2	×
angustatus, Sars, . . .	4	—	—	1	—
Alonopsis elongata, Sars, . . .	—	8	1	3	×
Alona quadrangularis (O. F. M.), .	4	—	—	2	×
affinis, Leydig, . . .	9	5	5	2	×
costata, Sars, . . .	2	—	5	4	×
guttata, Sars, . . .	6	3	2	2	×
intermedia, Sars, . . .	—	1	1	—	?
rectangula, Sars, . . .	2	—	3	1	×
rustica, Scott, . . .	—	1	—	1	×
rostrata (Koch) . . .	—	—	3	2	×
Rhynchotalona falcata (Sars), . .	—	1	1	3	—
Graptoleberis testudinaria (Fischer),	9	3	2	2	×
Alonella excisa (Fischer) . .	10	5	3	5	×
exigua (Lilljeborg), . .	3	2	1	—	—
nana (Baird), . . .	7	6	6	1	×
Peracantha truncata (O. F. M.), .	6	2	4	2	×
Pleuroxus trigonellus (O. F. M.), .	—	—	1	—	×
uncinatus, Baird, . . .	—	1	3	—	—
Chydorus globosus, Baird, . .	—	1	1	—	×
ovalis, Kurz, ...	2	2	2	1	×
latus, Sars, ...	?	—	—	?	?
sphaericus (O. F. M.), . .	14	9	5	5	×
barbatus (Brady), . . .	4	2	—	1	×
Monospilus dispar, Sars, . . .	—	—	1	—	—
POLYPHEMIDAE.					
Polyphemus pediculus (Linn.), .	—	5	5	4	×
Bythotrephes longimanus, Leydig, .	—	—	—	—	×
LEPTODORIDAE.					
Leptodora kindtii (Focke), . .	—	—	—	—	×
Total Cladocera (Mayo and Galway, 58),	24	31	35	31	45
		Clew Bay District, 48			

LIST OF FRESH-WATER ENTOMOSTRACA—*continued.*

SPECIES.	Clare Island.	CLEW BAY DISTRICT.			Rest of Mayo and Galway.
		Achill Island.	Westport and Castlebar.	Louisburgh and Croagh-patrick.	
Total number of stations, .	21	15	14	9	—
COPEPODA.					
CENTROPAGIDAE.					
Diaptomus gracilis, Sars, . .	5	6	6	1	×
laticeps, Sars, . . .	—	—	—	—	×
sancti-patricii, Brady, . .	—	—	—	—	×
Eurytemora velox (Lilljeborg), .	1	1	—	—	—
CYCLOPIDAE.					
Cyclops strenuus, Fischer, . .	—	2	2	—	×
oithonoides, Sars, . . .	—	—	—	—	×
?bicuspidatus, Claus, . . .	1	—	—	—	—
languidus, Sars, . . .	2	1	—	—	—
nanus, Sars, ...	—	1	—	—	—
vernalis, Fischer, . . .	2	—	2	—	—
bisetosus, Rehberg, . . .	1	—	—	—	—
viridis (Jurine), . . .	4	4	1	2	—
bicolor, Sars, . . .	—	—	1	—	—
rubellus, Lilljeborg, . .	3	—	2	—	—
varicans, Sars, . . .	—	—	2	—	—
fuscus (Jurine), . . .	—	—	2	1	—
albidus (Jurine), . . .	6	—	4	—	×
serrulatus, Fischer; varius, Lillj.,	14	3	4	?	?
macruroides, Lillj., . .	3	2	3	—	—
prasinus (Jurine), . . .	3	2	—	2	—
affinis, Sars, . . .	1	—	2	—	—
fimbriatus, Fischer, . . .	4	—	1	—	—
CANTHOCAMPTIDAE.					
Canthocamptus minutus (O. F. M.),	—	—	—	—	×
lucidulus, Rehberg, . . .	—	—	1	—	—
crassus, Sars, . . .	2	—	1	—	—
pygmaeus, Sars, . . .	5	1	2	1	—
zschokkei, Schmeil, . . .	1	—	—	2	—
praegeri, n.sp., . . .	1	—	—	—	—
hirticornis, Scott, . . .	1	—	—	—	—
Nitocra hibernica (Brady), . .	—	—	1	—	—
spinipes, Boeck, . . .	1	—	—	—	—
Total Copepoda (Mayo and Galway, 30),	19	9	16	7	8
		Clew Bay District, 21.			

LIST OF FRESH-WATER ENTOMOSTRACA—*continued.*

SPECIES.	Clare Island.	CLEW BAY DISTRICT.			Rest of Mayo and Galway.
		Achill Island.	Westport and Castlebar.	Louisburgh and Croagh-patrick.	
Total number of stations, .	21	15	14	9	—
OSTRACODA.					
CYPRIDIDAE.					
Cypria exsculpta (Fischer), . .	—	—	—	—	×
ophthalmica (Jurine), . .	2	—	—	1	×
Cyclocypris globosa (Sars), . .	—	—	—	—	×
serena (Koch), . . .	3	—	—	1	×
laevis (O. F. M.), . . .	1	—	1	—	×
Cypris fuscata (Jurine), . .	1	—	—	1	×
incongruens, Ramdohr, . .	—	—	—	—	×
? obliqua, Brady, . . .	2	—	—	—	—
Cyprinotus prasinus (Fischer), .	1	1	2	—	×
Herpetocypris reptans (Baird), .	1	2	—	—	×
Cypridopsis vidua (O. F. M.), .	2	1	2	—	×
obesa, Brady and Robertson, .	—	1	—	—	×
Cypridopsella aculeata (Costa), .	2	1	—	1	—
villosa (Jurine), . . .	—	—	—	—	×
picta (Straus), ...	—	—	—	—	×
Potamocypris fulva (Brady), . .	—	—	—	—	?
Notodromas monacha (O. F. M.), .	—	—	1	—	×
Ilyocypris bradyi, Sars, . . .	—	—	1	—	×
Candona candida (O. F. M.), . .	2	—	2	1	×
stagnalis, Sars, . . .	—	—	—	—	×
fabaeformis (Fischer), . .	—	—	—	—	×
Candonopsis kingsleii (Brady and Robertson),	—	—	—	—	×
DARWINULIDAE.					
Darwinula stevensoni, Brady and Robertson,	—	—	—	—	×
CYTHERIDAE.					
Metacypris cordata, Brady and Robertson,	—	—	—	—	×
Limnicythere inopinata (Baird), .	—	2	—	—	×
sancti-patricii, Brady & Robertson,	—	—	1	—	—
Cytheridea torosa (Jones), . .	—	—	2	—	×
Total Ostracoda (Mayo and Galway, 27),	10	6	8	5	24
		Clew Bay District, 15.			
Total Fresh-water Entomostraca (Mayo and Galway, 115),	53	46	59	43	76
		Clew Bay District, 84.			

NOTES ON SOME OF THE SPECIES.

Diaphanosoma brachyurum (Liévin) var. **nasuta** Kane.—This variety, first described by Mr. Kane from Loughs Mask and Corrib (**19**), has now been found by him in Glencullin Lough within the Survey area. So far as the evidence goes at present this is one of the forms which seem to specially connect the fauna of the west of Ireland with Scotland, and possibly also with Scandinavia, for a practically identical variety has been found in the first-named country, and exceedingly closely allied varieties (e.g. *productifrons* Sars and *frontosa* Lilljeborg) in both Norway and Sweden, whereas similar forms have not yet been found in other parts of Ireland or in England and Wales.

Latona setifera (O. F. M.)—Only one specimen of this rare species was found in a collection from a bog-pool near Sraheens Lough, Achill. It is recorded for the first time for Ireland.

Holopedium gibberum Zaddach.—This record depends upon a single specimen taken by Mr. Kane in L. Keel, Achill (**19**) before the commencement of the Survey. Previously Mr. Kane had found it at Ballynahinch, Connemara, and in L. Mask (**17**). It has not been found elsewhere in Ireland.

Daphnia obtusa Kurz *var.*—The form referred to is a rather small variety (maximum size $\frac{1}{13}''$) showing the characteristic *obtusa* bump supporting the first antennae in a very marked degree. Its shell spine is not so excessively short as in the typical form of the species, but corresponds with what is found in the variety "propinqua." It may be the same as the form figured in Lilljeborg's 'Cladocera Sueciae,' Tab. xi, fig. 7. I have seen it on several occasions in various parts of the British Isles and it has always been rose-pink in colour, quite different from the usual reddish tint of typical *D. obtusa*. The specimens seen, which included males and ephippial females as well as ordinary parthenogenetic females, were found in a bog-pool near Valley Lough, Dugort, Achill.

Simocephalus exspinosus (Koch).—Only seen from a bog-pool at Louisburgh by Mr. Kane. Although a comparatively common species in the south and east of England, it seems to be much rarer in other parts of the British Isles.

Ceriodaphnia pulchella Sars.—Only found in Castlebar Lough. In spite of its close relationship to *C. quadrangula*, the two species seem to be mutually exclusive, not only in the same piece of water, but in the same district. The present form is characteristic of what may be called, for want of a better name, "lowland" country.

Ceriodaphnia affinis Lilljeborg.—Barley Hill Lough, near Westport, is the only place where this has been found. It is decidedly rare in the British Isles, there being but three previously recorded localities for it, two in England and one in Scotland.

Bosmina longirostris (O. F. M.).—Only obtained from Islandeady Lough between Westport and Castlebar. The particular form seen seems to be close or identical with the var. *similis* Lilljeborg.

Ilyocryptus sordidus Liévin.—A post-abdomen only of this species was seen in a collection from a deep pond on the moor between Dugort and Achill Sound.

Acroperus angustatus Sars.—Under this name are included all forms of Acroperus having the dorsal and ventral margins nearly straight and nearly parallel. Some of them would probably come under *A. neglectus* Lilljeborg, but it is very doubtful if that form can be regarded as a good species.

Alona intermedia Sars.—Found only in the deep pond already alluded to under *Ilyocryptus sordidus* and in Castlebar Lough. The previous British records of this species have all been from Scotland; and as it also occurs in Norway and Sweden, it may perhaps be looked upon as one of the representatives of the fauna common to the west of Ireland, Scotland, and Scandinavia.

Alona rustica Scott.—The two stations for this are Sraheens Lough, Achill, and Croaghpatrick. In the latter case the specimens were only obtained by washing wet mosses.

Rhynchotalona falcata (Sars.)—I obtained this rather rare species from the deep pond previously referred to under *I. sordidus* and *A. intermedia*, and Mr. Kane found it in Roonah Lough and a neighbouring lakelet, and also in Glencullin Lough. Brady and Robertson record its occurrence in Lough Moher in the Westport district (**9**).

Alonella exigua (Lilljeborg).—This species, as distinct from *A. excisa*, is now definitely recorded for the first time for Ireland. As both species were formerly included under *A. exigua*, it is impossible to say whether the *Lynceus exiguus* recorded by Brady and Robertson from Connemara (**9**) included the typical form or not, and Mr. Kane also informs me that the entry under this name in his "Additional Records" (**19**), p. 307, should be deleted, being uncertain. From the number of stations where it has been found, it does not appear to be a rare form in the district under review, although by no means approaching its very near relative *A. excisa* in abundance.

Pleuroxus trigonellus (O.F.M.).—Not found during the progress of the Survey, but recorded by Brady and Robertson from near Westport (9).

Chydorus latus Sars.—Specimens appearing superficially at least to belong to this species have been seen both by myself and Mr. Kane on several occasions, but I am not quite sure that they are to be looked upon as distinct from *C. sphaericus*.

Monospilus dispar Sars.—Recorded many years ago from Westport by Brady and Robertson (9), but not seen since in any part of Mayo and Galway.

Diaptomus sancti-patricii Brady.—It is very unfortunate that this species is not more certainly characterized, and that it should not have been recognized since first taken by Brady in Connemara (5). If it is really distinct from *D. laciniatus*, it is one of the very few species peculiar to the British Isles. If, on the other hand, it is identical with that species, it is still one of the forms linking the west of Ireland with Scotland and Scandinavia.

Eurytemora velox (Lilljeborg).—On Clare Island this species was only found in Kinnacorra marsh pond, where the water is distinctly brackish, while the Achill locality was a bog-pool near Valley Lough, Dugort, in which the water was apparently quite fresh. Although now recorded for the first time in Ireland, it is probably by no means an uncommon form in slightly brackish water all round the Irish coast.

Cyclops languidus Sars.—The Clare Island stations for this species are Creggan Lough and a pond near the old Signal Tower at the extreme west of the island. In Achill the species was found in collections made from the moor north of Sraheens Lough. New to Ireland.

Cyclops nanus Sars.—Only recorded from the moor north of Sraheens Lough, Achill. New to Ireland.

Cyclops vernalis Fischer.—Of the two Clare Island stations one was the pond near the Signal Tower already mentioned, and the other a brackish pond in the marsh near the hotel. In the latter case the first antennae were 18-jointed owing to the splitting of what is ordinarily the 7th joint (of 17-jointed species) into two. The fourth and fifth were also partially split. In the Westport district this species was seen in the river at Belclare and in Barley Hill Lough. New to Ireland.

Cyclops bisetosus Rehberg.—Only seen in the brackish Kinnacorra marsh pool, Clare Island. The specimens were pitted in the same way as is usual in *C. bicuspidatus*. New to Ireland.

Cyclops bicolor Sars.—The solitary record for this species was from Barley Hill Lough, Westport. New to Ireland.

Cyclops rubellus Lilljeborg.—This species was found in three of the gatherings from Clare Island (Creggan Lough, L. Leinapolbauty, and marsh pond near the light-house) and in Castlebar and Islandeady Loughs. New to Ireland.

Cyclops varicans Sars.—Only seen in the river at Westport and in Castlebar Lough. New to Ireland.

Cyclops serrulatus, Fischer.—Of the three forms into which *C. serrulatus* has been divided by Lilljeborg, only two have been recognized during the Survey. By far the larger number of specimens seen were of the "*varius*" type; but examples of the "*macruroides*" type were also taken in many places. No examples of *C. serrulatus*, in the strict sense, were seen anywhere; and indeed this form of the species seems to be much the rarest of the three in the British Isles. Specimens apparently agreeing with each of Lilljeborg's three forms of "*varius*," viz. *speratus*, *proximus*, and *brachyurus*, were noted, but it is very doubtful if the separate recording of these fine subdivisions of the species is of any real value.

Cyclops affinis Sars.—This widely distributed though rather rare species is now recorded for the first time in Ireland. On Clare Island it was found in a little lough not far from Craigmore and on the mainland in Castlebar Lough and in the river at Westport.

Canthocamptus lucidulus Rehberg (= *C. minutus* Claus).—Only found in Castlebar Lough. New to Ireland.

Canthocamptus (Attheyella) crassus Sars.—The two localities on Clare Island for this species are Creggan Lough and a little lough near the coast west of Craigmore. The mainland station is Castlebar Lough. New to Ireland.

Canthocamptus (Attheyella) pygmaeus Sars.—It is a clear proof of the small amount of attention hitherto paid to the fresh-water Copepoda of Ireland that this species has not been previously recorded in the country. Although not very common in collections made among the ordinary vegetation of ponds, etc., it is usually to be found in wet moss from almost any locality. Most of the specimens seen during the Survey were obtained by washing wet mosses and liverworts.

Canthocamptus (Attheyella) zschokkei Schmeil.—The only place where this species was obtained on Clare Island was a small lough in the neighbourhood of Craigmore on the south side of the island. It was also found in moss from the sides of Croaghpatrick, and Mr. Kane found it in a lakelet by the side of Roonah Lough.

Canthocamptus (Attheyella ?) praegeri, n.sp. (pl. I, figs. 1–9).—*Specific characters.—Female*: Body rather short and thick, tapering considerably behind. Rostrum small, situated on a rostral plate, indistinctly separated from the rest of the cephalic segment. Abdominal segments spinulose on posterior margins; also rows of excessively small spines on the dorsal surface of the last thoracic and first abdominal segments (fig. 6). Edge of anal plate fringed with numerous fine hairs. Furca (fig. 8) short, obliquely truncate, armed with strong spines on both inner and outer margins. The two principal setae on each lobe stout and widely divergent; small inner seta bent inwards a little beyond base. First antennae short, seven-jointed (with last joint very indistinctly divided), the last five joints being at an angle to the first two. Accessory branch of second antennae indistinctly two-jointed with four stout setae (two lateral and two terminal) and a very small spinule near the tip. First pair of feet (fig. 4) with both branches three-jointed, inner just a trifle longer than the outer. Second, third, and fourth feet with three-jointed outer and two-jointed inner branches (fig. 5). Fifth feet (fig. 7) with distal joint moderately large, broadly ovate, and armed with five setae, the two outer being short. Inner expansion of basal joint broad, extending slightly beyond distal joint and armed with six setae, the two outer and two inner being short. Length (in preserved condition), without tail setae, $\frac{1}{60}$ inch.

Male unknown. Spermatophore (fig. 9) cylindrical, with rounded distal and more tapering proximal end, attached to genital segment of female by an unusually long, slender tube, bent near junction with body of spermatophore.

Only a single specimen of this new species has been seen. It was obtained from wet moss from the side of the little stream flowing from the Light-house Marsh to the coast on Clare Island. The most striking feature, and one which separates it at a glance from all other species of Canthocamptus, is the peculiarly divergent character of the two large setae on each furcal lobe. The species belongs in the main to the Attheyella section of the genus Canthocamptus, but presents some unusual characteristics, *e.g.*, seven-jointed first antennae. I have much pleasure in naming it after Mr. R. Lloyd Praeger, to whom the Clare Island Survey owed its inception and continued inspiration, and to whose patient labour and never-failing enthusiasm and encouragement is due so much of what is known to-day of the Irish fauna and flora.

Canthocamptus (Mesochra) hirticornis Scott.—Only found in Kinnacorra marsh pond on Clare Island, the water there being slightly brackish, as might

indeed be anticipated from the presence of this species. New to Ireland.

One specimen, agreeing in all other respects with the typical form of the species, exhibited the remarkable modification of the furca (Pl. I, fig. 10) which has been already referred to in connexion with the question of variations.

Nitocra spinipes Boeck (= *Canthocamptus palustris* Brady, var. *elongatus* Scott).—This species, which must, like the foregoing, be regarded rather as a brackish than a fresh-water form, was only taken in little pools on the rocks not far above high-water mark on the north-east coast of Clare Island. The water in these pools was turbid and noticeably green, due to the presence of great numbers of various kinds of microscopic algae. Among the latter, Professor G. S. West informs me, were the two very interesting species, *Brachiomonas submarina* and *Oocystis submarina*. New to Ireland.

Cyclocypris serena (Koch).—The specimens from one of the Clare Island localities (Loughanaphuca) recorded under this name seemed to me to be somewhat peculiar. To the naked eye they were almost black and uniformly coloured, but showed under the microscope brown patches similar to those in *Cypria ophthalmica*, only much darker. They were not so tumid as in typical *C. serena*. Dr. Vávra, however, considers them as belonging to this species.

Cypris ? obliqua Brady.—The specimens from two ponds in the south-western portion of Clare Island were not quite adult, but appeared to belong to *C. obliqua*. If this determination is correct, they represent a new record for Ireland.

Cypridopsis vidua (O. F. M.).—The specimens from Clare Island and Achill were not so tumid nor so evidently marked with colour-bands as is usually the case in this species. On the other hand, they showed much more pronounced pitting of the shell. Upon reference to Dr. Vávra, however, he said that they exhibited the typical anatomical details of *C. vidua*.

Limnicythere sancti-patricii B. & R.—Recorded by Brady and Robertson from L. Moher (**9**), but not seen during the progress of the survey.

Cytheridea torosa (Jones).—Recorded by Norman from Newport and Westport (**20**), but not seen during the progress of the survey.

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EXPLANATION OF PLATE I.

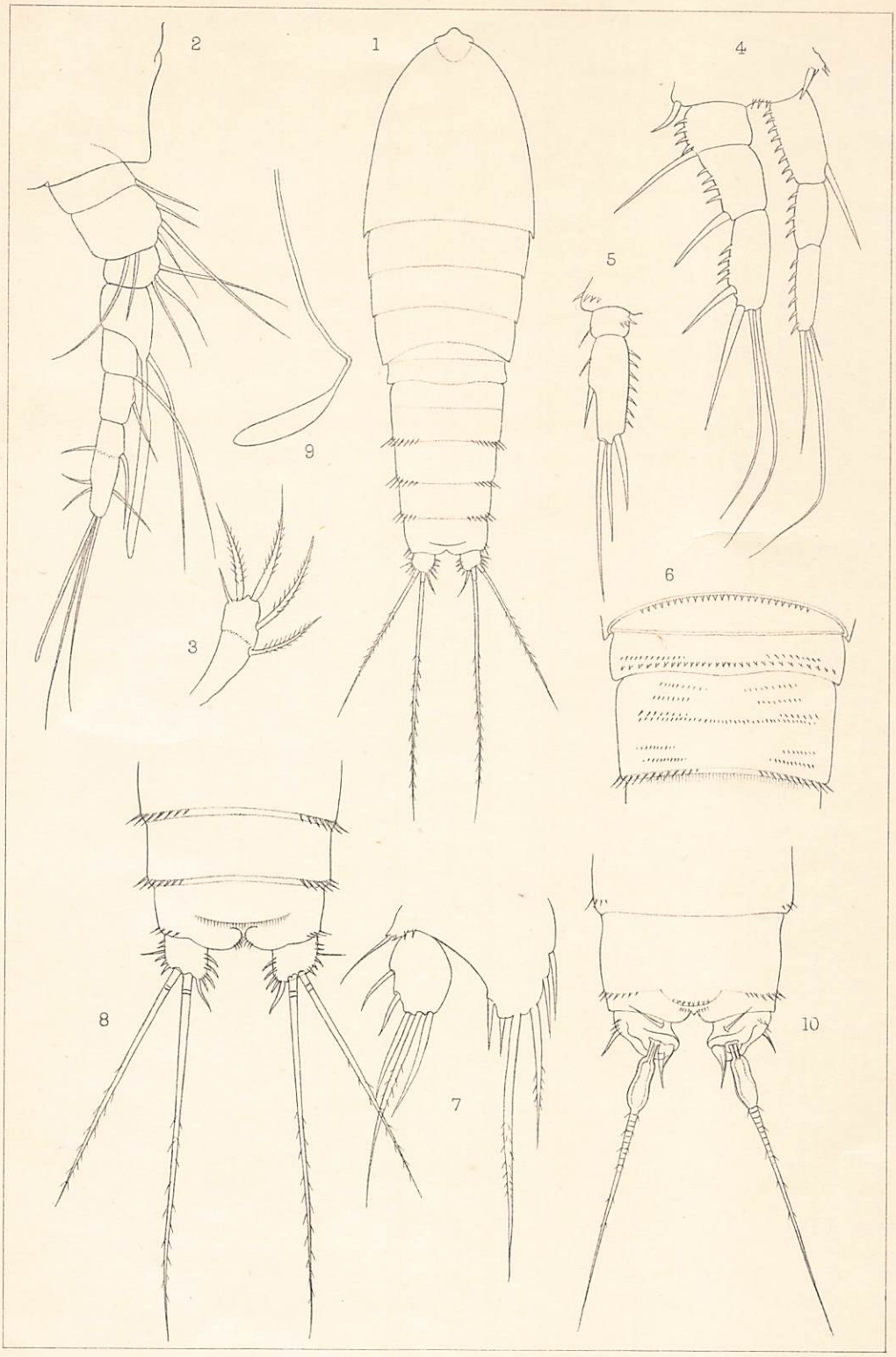
Canthocamptus (*Attheyella ?*) *praegeri*, n. sp.

Fig.

1. Dorsal view. × 200.
2. First antenna. × 650.
3. Accessory branch of second antenna. × 1000.
4. First foot. × 650.
5. Inner ramus of second foot. × 500.
6. Last thoracic and first abdominal segments—dorsal view. × 350.
7. Fifth foot. × 550.
8. Last abdominal segments and furca—dorsal view. × 350.
9. Spermatophore. × 250.

Canthocamptus (*Mesochra*) *hirticornis* Scott.

10. Furca of sport ? × 350.



D. J. Scourfield del. West, Newman lith.

1-9. Canthocamptus (Attheyella ?) praegeri *n. sp.*
10. do. (Mesochra) hirticornis ? (*sport ?*)