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T. T. MACAN AND J. W. G. LUND

RECORDS FROM SOME IRISH LAKES

PART 1.—MOLLUSCA, *GAMMARUS, ASELLUS,* EPHEMEROPTERA, AND HETEROPTERA.
BY T. T. MACAN.

PART 2.—PHYTOPLANKTON.
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RECORDS FROM SOME IRISH LAKES.

By T. T. MACAN and J. W. G. LUND,
Freshwater Biological Association.

Part 1.

MOLLUSCA, *GAMMARUS*, *ASELLUS*, EPHEMEROPTERA, and HETEROPTERA.

By T. T. MACAN.

[Read 22 June, 1953. Published 28 July, 1954.]

Between 31 July and 6 August, 1951, Professor D. A. Webb, Mr. H. C. Gilson and the author visited various Irish lakes on a tour to investigate possible routes for a post-congress excursion after the twelfth International Limnological Congress in England. Only a short period could be spent collecting at each halt, but collections were made whenever possible and it is thought that the results are of sufficient interest to put on record. The party collected plankton and three groups that interested the author (Mollusca, Ephemeroptera and Heteroptera), *Gammarus* for Dr. H. B. N. Hynes and Mr. G. M. Spooner, and *Asellus* for Professor H. P. Moon. Water samples were brought back for analysis by Mr. F. J. H. Mackereth and Mr. J. Heron, and some of their results are incorporated in Table 2. Table 1 gives some details of the lakes visited with their respective station numbers.

The first lake visited was L. Neagh (sts. 1–4), and thence the party travelled to the west coast of Co. Donegal, south to Sligo, west to Co. Mayo, and finally back to Belfast by way of L. Ree (st. 20), and L. Sheelin (st. 21) in Co. Cavan.

The lakes fall clearly into two categories : non-calcareous, with a highest calcium content of 8·1 mg./l., and calcareous, with a lowest calcium content of 20·0 mg./l. (Table 2). Most of the non-calcareous lakes lie in the metamorphic and granite rocks of Donegal ; Loughs Gartan (st. 24), Veagh (st. 25), Finn (st. 28), Mourne (st. 29), and Derg (st. 30), are typical small mountain lakes, and Awalie (st. 26) and Dunglow (st. 27) are water-filled depressions on the granite plain known as The Rosses. Further south, L

Allen (st. 31) is in an area of sandstone and shale and L. Furnace [1] (st. 32) and the little lough beside it (st. 33), which looked as if they were poor in lime, lie on sandstone drift deposited in steep parallel moraines. L. Derryadd (st. 23) lies on the fen peat south of Lough Neagh. Its low calcium content was a surprise.

The calcareous lakes are not easy to describe concisely, and the scientific results do not justify a lengthy description of each. L. Neagh (sts. 1–4) lies on a flat sheet of basalt ; L. Oughter (st. 22) in a great shale and limestone drumlin area ; L. Talt (st. 16), too, owes its high calcium content mainly to drift. The rest are all limestone lakes and, though some are partly enclosed by older non-calcareous rocks, all lie in and drain areas of which a high proportion is limestone. Loughs Arrow (sts. 9, 10), Gara (st. 15), Carra (st. 19), and Conn (sts. 17, 18) lie in flat, Loughs Gill (sts. 5–8), Glencar (st. 11), Erne (sts. 12, 13), and Melvin (st. 14) in more mountainous country. There is little reed-bed development in most of these loughs and the bottom near the edge is generally stony. There is a deposit of calcareous marl on the bottom of Loughs Carra and Sheelin.

The productivity of a lake is an important feature, but unfortunately one that is not easy to measure ; no simple chemical analysis will reveal what it is. The amount of phytoplankton and the species present gives the best indication though, as Lund reporting on it in part 2 points out, conclusions from single samples must be drawn with caution. L. Neagh is a highly productive or eutrophic lake in a class by itself. The rest of the calcareous lakes visited obviously vary greatly ; some, with small and little-cultivated drainage areas, are probably not particularly productive. The question is discussed further in part 2, and impressions gained from looking at the loughs agree with the conclusions there, except that the low position of L. Ree is unexpected.

The Fauna.

The records, together with some other data, are set out in Tables 2, 3 and 4. In Table 2 the calcareous lakes are placed first and the non-calcareous ones after them, but in these two categories the order is chronological because there does not seem to be any factor of significance to the animals found that could provide a basis for any other arrangement. In Tables 3 and 4 an ecological arrangement of the stations has been attempted.

Relative abundance was judged roughly at the time of collection and indicated by the symbols used in the tables : $\pm$ = scarce, $+$ = fairly abundant, $++$ = abundant, and $+++$ = very abundant. When only two or three specimens of a species were taken, the actual number is shown. The actual number of almost all the Corixidae taken is shown (Table 4). Occasionally *Asellus* (or some such animal) was seen but not taken, so that

[1] L. Furnace lies below the level of high spring tides, and is, therefore, somewhat brackish. The salinity is at a minimum at the N.W. corner, where collecting was done, but even here is sufficient to permit of the growth of *Fucus*. The small lake beside it (station 33) stands a few feet higher and is quite free from salt water.

identification was not possible, and records of this kind are indicated by " sp." in the column of the commonest species of the genus. When, as was sometimes done, search was made for one group only, the station has been omitted from all but the relevant table. Apart from this, Table 3 includes all but stations 1–4 (whether Ephemeroptera were taken or not), but Table 4 includes only those at which specimens were found. A definite note that no members of a group (or species) were seen is indicated by ' 0 ' in the appropriate column, otherwise negative records are shown by dashes. When a collector has constantly to bear time in mind, his field notes will inevitably be found to have a certain lack of uniformity when it comes to tabulating them for publication.

Mollusca. The records of snails are not of outstanding interest. The distribution of Mollusca in Ireland is well known (Ellis, 1951), and the only new vice-county record was *Hydrobia jenkinsi*[2] in Fermanagh. From an ecological standpoint the records show how fallacious any conclusion about the fauna of a lake based on collecting at one spot only is likely to be, the four stations (5–8) in L. Gill being particularly instructive in this respect. It is noteworthy too that, although there was plenty of time for collecting in L. Carra (st. 19), the list of species from that lake is due entirely to the picking up of dead shells along the strand, and in L. Ree (st. 20) many more species were found washed up than in the water. L. Sheelin (st. 21) was of particular interest because, within a short length of shore line, it was possible to find every gradation from a bottom covered with limestone blocks with no finer material between and no vegetation, through sand with *Littorella* sward, to a bay floored with marl. A patch of *Schoenoplectus lacustris* (L.) Palla grew in the middle of the bay with bare mud around it, except at two places where there were patches one of *Carex* sp. and one of *Potamogeton natans* L. Where the water was more than two feet deep, the bottom was covered by a thick and continuous bed of *Chara*. *Limnaea stagnalis* was taken abundantly in the bay but not at all outside it. *Planorbis carinatus* and *P. planorbis* were abundant in the bay and scarce elsewhere. *P. vortex* and *P. contortus*, on the other hand, occurred only outside the bay under stones on sand. *Theodoxus fluviatilis* was abundant on bare stones on the most exposed part of the stretch and was not found anywhere else ; *Bithynia tentaculata* was abundant with it and scarce elsewhere. *Valvata piscinalis* was very abundant among the *Chara* and scarce everywhere else.

Crustacea. Amphipoda. *Gammarus pulex* was not found at all, *G. duebeni* proved to be widespread, *G. tigrinus* occurs in Lough Neagh though why it was found only at two stations (2 and 3) is inexplicable, and *G. lacustris* was taken in L. Erne and L. Gara (st. 15). The interest of these records is that they add substantial confirmation to what was previously based on somewhat meagre data, Hynes (1951), Spooner (1951).

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[2] Names of the authors of species will be found in the tables, and not in the text unless that is the only place where the species is mentioned.

Isopoda. The ecology of *Asellus* is, as usual, obscure. Its presences and absences could not be explained, and the two places where *A. meridianus* was found were as unlike as any visited.

Ephemeroptera. Anyone assessing the value of these records must bear in mind not only the hurried nature of the collecting but also the fact that some species are not to be found at this time of year, being, as far as is known, in diapause in the egg stage; *Leptophlebia*, for example, is probably widespread, particularly in the non-calcareous places, but both species complete emergence by midsummer. We were probably only just in time for *Centroptilum luteolum*, for, although many adults were dancing beside L. Melvin, but one nymph was taken.

The stations can be arranged fairly well in groups (Table 3) without trimming the data too much ; in fact, apart from putting the small loch beside L. Furnace (st. 33), in which the main plant was *Lobelia* into the section " stones and some *Littorella* ", there is no forcing of the stations into the various categories. This has been facilitated by the omission of all the L. Neagh stations (1–4), at none of which, unaccountably, were any Ephemeroptera taken.

Siphlonurus linneanus is probably chiefly a species of reed-beds and sheltered conditions. It was described by Eaton (1883–88) from a specimen of unknown origin. Schoenemund (1930) records it from Germany, Austria, Poland, Russia and Sweden, but has seen only three German specimens. Jensen (1951) has recently recorded it from Denmark for the first time and quotes records from Norway and Finland. It is known from the R. Tummel (Kimmins, 1942) and the R. Cree (Kirkcudbrightshire) (Macan, 1951) in Scotland but has not been taken in England or Wales. Harris (1952) records it from several of the limestone lakes in Ireland, including L. Sheelin, from L. Gartan, and from slow deep reaches of the R. Fergus, Co. Clare ; he describes it as local, but clearly it is much more widespread in Ireland than in most other countries. *Cloeon simile* is commonest, according to Harris, in shallow sheltered bays, though I have found fair numbers of it in submerged vegetation in deeper water (Macan, 1949). *Centroptilum luteolum*, though it sometimes abounds in weed-beds in the middle of rivers (Macan and Macan, 1940, Macan, 1949), I associate particularly with sandy patches and other places where *Littorella* is found at the edge of lakes and rivers, an impression that the present records confirm. *Ephemerella ignita* is a remarkably ubiquitous species that occurs in fair numbers in stony Lake District becks and in great numbers in south-country chalk rivers (Macan and Macan, 1940, and many subsequent unpublished observations). Neither Schoenemund (1930) nor Kimmins (1942) mention any but running-water localities and Harris (1952) states categorically that it does not occur in lakes or other still waters, but I have records from Crummock Water and Ullswater in the Lake District (unpub.).

The Ecdyonuridae evidently occur only where there are stones that they can get underneath. The few present records suggest that *Ecdyonurus dispar*

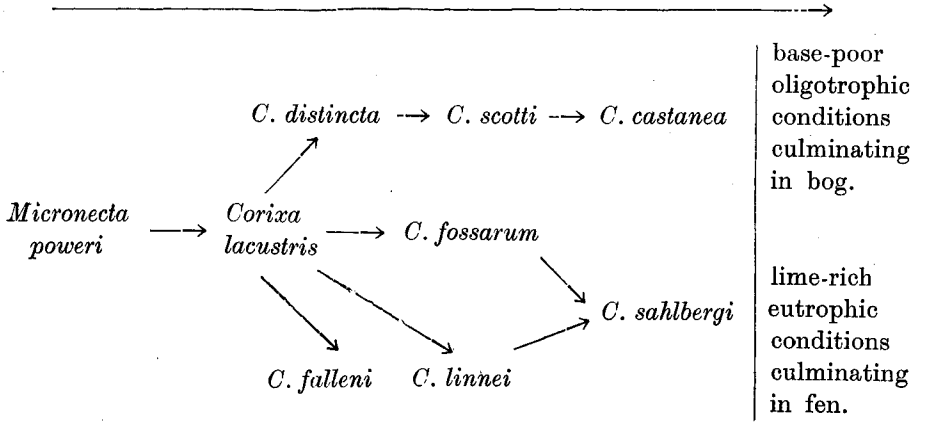
and *Heptagenia sulphurea* may be vicariants, though they do not indicate how the habitats of the two may differ. That the two species of *Heptagenia* are vicarious is much more certain. *H. lateralis* is common in the lime-poor Lake District lakes and *H. sulphurea* has not been taken in any of them, though it does occur in the R. Rothay and the R. Brathay (author's unpublished observations). Harris (1952) records that *H. sulphurea* is common in the Irish limestone lakes, and *H. lateralis* confined to upland and mountain lakes.

We ignored *Caenis* because the identification of the nymphs is still uncertain, and our method of collecting did not secure *Ephemera*. Excluding these, and *Leptophlebia* already mentioned, the only likely additions to this list are *Siphlonurus lacustris* Etn., which occurs in most Lake District lakes, being abundant in some of the least productive (Macan, 1951, and subsequent unpublished observations), and *Heptagenia fuscogrisea* (Retz.) which Harris (1952) finds commonly in the stony limestone lakes in the middle and west of Ireland, though it is extremely rare in the rest of Britain. The writer visited L. Sheelin at the end of May, 1953, and found *Heptagenia fuscogrisea* and *H. sulphurea* in moderate numbers. The absence of any other Ecdyonurid was striking. *H. fuscogrisea* was emerging at the time and the nymphs of *H. sulphurea* looked ready for emergence. It is likely that all *H. fuscogrisea* and most *H. sulphurea* had emerged at the time of our visit in 1952.

Corixidae. Early August is a bad month for collecting Corixidae because so many are still nymphs and therefore unidentifiable, and it is not possible to be certain that scarcity of any species is not due to its having a later breeding period than others. Nevertheless the results are of interest.

Table 4 presents the data for those stations from which Corixidae were taken; they were absent from a number of the more exposed stations as expected. *Micronecta*, a small insect easily overlooked if special search is not made for it, has been ignored.

Macan (in press) has suggested that the ecological relationships of the Corixidae in lakes are as follows:—



Incidentally the collecting which led to this conclusion, a modification of earlier schemes, was done in Denmark, and led also to the conclusion that specimens of " striata " in Denmark and Britain were not identical and ought to be separated as distinct species. The name *striata* has been retained for the Danish species and a new name, *lacustris*, suggested for the British species. *C. lacustris* Macan occurs on the continent, but *C. striata* (Linnaeus) does not occur in Britain, and, therefore, if this separation is recognised, all British references to *striata* will have to be changed to *lacustris*.

The last six loughs in table 4 are base-deficient and the frequent occurrence and comparative abundance of *C. scotti* in them is as expected. Some of the others fit in less well with the scheme. It might be expected that, since so much of our collecting was on the exposed shores of lakes, *C. lacustris* would be encountered more often and in greater numbers than any other species. A brief glance at table 4 shows that this is not so. Its place seems to be taken by two species, *C. germari* and *C. pearcei*. *C. germari* is often found in base-deficient places (Macan, in press), but Walton (1943) records it as the commonest species in open water in the calcareous Yeo Reservoir at Blagdon in Somerset, and its ecological relationships are likely to remain obscure until more work has been done on calcareous lakes. The relationship between *C. pearcei* and *C. lacustris* may be zoogeographical rather than ecological. *C. pearcei* was originally described by Walton (1936) from specimens caught in L. Derg, in the Shannon system, not the L. Derg in Co. Donegal which we visited, and, as far as I know, has not been taken anywhere else except on Heinasaret Island off the north coast of Finland, from where Dr. K. Jordan has recorded a specimen (personal communication). It is an unmistakable species, unlikely to have been missed if abundant anywhere outside Ireland, in which country, however, if present records are a fair sample, it may be widespread. Hungerford (1948) points out that it is very close to the Canadian species *fallenoidea* (Hungerford) though unfortunately he gives no information about the habitat of the latter. Whether *C. pearcei* is an immigrant from North America that has succeeded in establishing itself in Ireland in the habitat occupied elsewhere by *C. lacustris* cannot be determined on the meagre evidence now available; it would be interesting to map its range accurately so that changes in subsequent years could be watched.

The abundance and frequent occurrence of *C. distincta* (Fieb.) was unexpected because, though it is one of the next species in the succession, it is typical of rather base-poor conditions; not a single specimen, for example, was taken in the Danish lakes (Macan, in press). But it must be pointed out that no previous work has been done in calcareous lakes of the type found in Ireland; the Danish lakes, though they too have a fairly high calcium content, may not be strictly comparable, the impression on the writer's mind being that they are much more productive than most and perhaps all of the Irish lakes that we saw. Apart from *C. semistriata*, which remains obscure ecologically, the records of the remaining species are in keeping with what is already known of their ecology (Macan, in press).

TAXONOMIC NOTES.

Males from L. Arrow, L. Conn (2), L. Furnace, and L. Sheelin were dissected and all showed the typical characters of *C. lacustris*, the species which, as mentioned, has had to be split off from *C. striata*.

The males of *C. pearcei* are very distinct and the unusually large front legs reveal their identity to the naked eye. The females, on the other hand, are difficult to distinguish from both *C. distincta* and *C. falleni*. Walton (1936), who is followed by Macan (1939), uses two characters: the right-angled corners of the pronotum, which are intermediate between the acute ones of *C. falleni* and the obtuse ones of *C. distincta*, and the ratios of the lengths of the various parts of the middle leg. The first character is not satisfactory, since there is some variation and occasionally it does not provide a certain distinction between *falleni* and *distincta*. The leg ratios seemed worth further investigation since there was a fair amount of material available. Walton (1936) does not state how many specimens his figures are based on. Accordingly, every specimen of *C. pearcei* brought back from Ireland, a similar number of *C. distincta* from all parts of Britain, and every *C. falleni* in the Freshwater Biological Association's collection were measured. The specimens were mounted ones, stuck with tragacanth mucilage on to celluloid strips, and they were measured under a binocular microscope giving a magnification of × 33 with an eyepiece micrometer divided into 50 units, 16 of which equalled 1 mm. The left middle leg of each specimen was measured but, if subsequently a wide departure from the mean was found, both legs were measured. All the ratios were found to vary rather widely on either side of the mean, which is due to some extent to the inaccuracy of the method used; an exact determination of the limits of each limb segment could probably be made only after clearing each specimen. However, as a practical working distinction between the species was thought to be more valuable than an absolute distinction, the figures obtained are discussed further.

It is worth first considering the actual measurements. The femora of *C. pearcei* were found to be the shortest, those of *C. distincta* the longest on the average, but the difference is very small. The tibiae of *C. pearcei* and *C. falleni* are about the same size, those of *C. distincta* a trifle longer, and the same applies to the tarsi. The greatest difference is shown by the claws, those of *C. pearcei* being shorter than those of the other two. *C. pearcei* and *C. falleni* just overlap, but between 67 specimens of *C. pearcei* and 76 specimens of *C. distincta* there is an almost complete distinction, the claws of *C. pearcei* ranging from 17 – 19 divisions (1·06 – 1·18 mm.) those of *C. distincta* from 20 to 24 divisions (1·25 – 1·5 mm.) with the exception of a single specimen with claws 19 divisions in length.

The ratios were set out according to sex and averaged. The ratio femur : tarsus was 100 : 31·7 in the males and 100 : 31·8 in the females of *C. falleni*, but in the other eight instances the average of the females was lower than that of the males. The femur : tarsus ratio was 100 : 49·7 in male and 100 : 48·7 in the female of *C. distincta* and this difference was found to be

just significant when the ' t ' test was applied. Other differences were smaller, but it seems desirable on these findings to compare females only and this is done in Table 5. The crosses are against the ratios given by Walton (1936).

C. falleni cannot be distinguished on any of the ratios. It will be noted that the average of the femur : tibia ratio is slightly smaller in *C. falleni* and the femur : claw ratio distinctly larger ; and, therefore, the tibia : claw ratio has been calculated. It does show a bigger average difference than any of the others but still does not afford an absolute distinction, and has not been included in the table.

The ratios are more satisfactory for the separation of *C. distincta* and *C. pearcei*. Each segment of the *C. distincta* leg has a higher ratio on the average than its counterpart on *C. pearcei*, though the ranges overlap, but as might be expected from this, when the femur is compared with the sum of the other three segments, an almost complete difference is obtained. The difference would be complete and comparatively large but for a single anomalous specimen with a ratio of 100 : 117. The ratios of the individual segments of this specimen, which appeared to be a normal one, are 100 : 46 : 33 : 38, so that it is completely intermediate. It was difficult to decide to which species it belonged and it was eventually referred to *C. distincta* because the claw was 20 divisions long, and, therefore, longer than was ever found in *C. pearcei*. It came from L. Gill. The conclusion is that leg ratios do not provide a very good distinction for ordinary taxonomic purposes.

Further examination did reveal a character which gives a clear-cut distinction between these species. Along the underside of the middle femur of *C. pearcei* there is a row of spines and a row of hairs about three times as long as the spines and continuous from the base nearly to the apex. *C. falleni* is similar except that there are very few hairs between the base and the middle of the leg. On *C. distincta* there are two or three isolated hairs.

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PART 2.

PHYTOPLANKTON.

BY J. W. G. LUND.

Phytoplankton was collected by throwing a net from the shore and towing it back and by taking a sample of surface water. Table 6 summarizes the results in a way that makes quantitative and qualitative comparisons between the lakes possible, and Table 7 gives a list of the commoner species and the lakes they were found in. It is necessary to be very cautious about assessing the nature of the algae in a lake from a single sample but, if this be borne in mind, the data in Table 6 permit the following observations*:— L. Neagh, from which a sample was taken in the outflow at Toome Bridge, had by far the largest standing crop ; since the mean number cells per filament of the *Oscillatoria* present was above 200, there were at least 3,000,000 cells per ml. Such enormous growths of blue-green algae (water-blooms, water-flowers) occur only in eutrophic lakes. Loughs Arrow (st. 10), Erne (st. 13), Melvin (st. 14), Conn (st. 17) and Oughter (st. 22) showed a varied flora of species characteristic of eutrophic lakes ; loughs Gara (st. 15), Sheelin (st. 21) and Glencar (st. 11) rather less markedly so. There was no net collection for L. Gill (st. 6) but the species in the sample of surface water did not suggest a eutrophic lake. L. Carra (st. 19) was relatively poor in species and numbers. L. Talt (st. 16) contained few species characteristic of eutrophic lakes and L. Ree (st. 10) none ; for neither of the loughs could an estimate of the crop be made. All the above are calcareous lakes (see Table 7) and taken as a whole their plankton shows a marked contrast to that of the other lakes visited all of which were non-calcareous. Thus, in the calcareous lakes there were, on the average, 4·3 species of Myxophyceae and 0·8 species of desmids per drop of net plankton collected ; in the non-calcareous ones there were 0·2 species of Myxophyceae and 3·1 of desmids per drop. Such differences are characteristic of what one usually finds when comparing eutrophic and oligotrophic lakes, the former being commonly more calcareous than the latter. The non-calcareous lakes contained but few species apart from desmids and had it been possible to estimate the standing crops these too would almost certainly have been low. Loughs Gartan (st. 24), Veagh (st. 25) and Finn (st. 28) alone in this group showed some species occurring in moderately eutrophic to eutrophic lakes and in the last two, these were accompanied by a considerable development of desmids.

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* Further samples from several of these loughs collected for me by Mr. F. E. Round in September, 1953 gave similar results.

TABLE I.

Stations at which samples were taken or collections made.

No.	Name of lake	Station	Vice-county	N. latitude and W. longitude
1	Neagh	Lady Bay	Antrim	54° 33½′; 6° 19′
2	,, ...	W. of Ardmore Point ...	Armagh	54° 31′; 6° 27′
3	,, ...	Washing Bay	Tyrone	54° 32′; 6° 36′
4	,, ...	Ballyronan	Londonderry	54° 43′; 6° 32′
5	Gill	S.W. corner	Sligo	54° 14′; 8° 26′
6	,, ...	East end, near Sriff cottage	Leitrim	54° 15′; 8° 19′
7	,, ...	N.E. shore	Sligo-Leitrim boundary	54° 16′; 8° 21′
8	,, ...	Outflow	Sligo	54° 16′; 8° 27′
9	Arrow	N.E. shore, E. of Kingsborough House.	Sligo	54° 4½′; 8° 19′
10	,, ...	W. shore, S. of Hollybrook House.	Sligo	54° 3′; 8° 20′
11	Glencar	E. part of N. shore ...	Leitrim	54° 20½′; 8° 22′
12	Erne (Lower) ...	S. shore, near Ely Lodge	Fermanagh	54° 25′; 7° 44′
13	Erne (Lower) ...	S. shore, opposite Castlecaldwell promontory.	Fermanagh	54° 28′; 7° 57′
14	Melvin	S.W. shore, near E. end	Leitrim	54° 25′; 8° 8′
15	Gara	Outflow, and shore to W.	Sligo	53° 57½′; 8° 25′
16	Talt	S.E. end	Sligo	54° 4½′; 8° 55′
17	Conn	Near Pontoon Bridge ...	West Mayo	53° 59′; 9° 12′
18	,, ...	Near Knockmore ...	West Mayo	54° 1′; 9° 11′
19	Carra	Bay E. of outflow ...	East Mayo	53° 39′; 9° 16′
20	Ree	N. bay, 1 mile W. of Lanesborough.	Roscommon	53° 41′; 8° 1′
21	Sheelin	Bay in Middle of N.W. shore.	Cavan	53° 49′; 7° 21′
22	Oughter	Connexion between Inishmuck L. and Carratraw L.	Cavan	54° 2′; 7° 26′
23	Derryadd ... ... (S.W. of L. Neagh).	S. shore	Armagh	54° 29′; 6° 35′
24	Gartan	N.E. end	W. Donegal	55° 0′; 7° 54′
25	Veagh (Beagh) ...	N.E. end	W. Donegal	55° 3′; 7° 56′
26	Awalie (beside Gweedore–Dunglow road).	E. shore	W. Donegal	54° 59′; 8° 19′
27	Dunglow	S.E. shore	W. Donegal	54° 57′; 8° 20′
28	Finn	N.E. end	W. Donegal	54° 52′; 8° 6′
29	Mourne	N.E. end	E. Donegal	54° 45½′; 7° 53′
30	Derg	S.E. shore, near ferry ...	E. Donegal	54° 36′; 7° 51′
31	Allen	W. shore, S. of Tarmon...	Leitrim	54° 7′; 8° 5′
32	Furnace	Bay near N.W. corner ...	W. Mayo	53° 55′; 9° 35′
33	unnamed	small lough immediately S.W. of station 32.	W. Mayo	do.

TABLE 2.

Lough	Station No.	pH	Ca mg/l.	Conductivity recip. meg.	Nature of bottom	Macrophytic vegetation
Neagh	1	8·4	25·8	225	stones	none, except *Eleocharis palustris* in small bays ..
	2	8·3			stones	occ. *Pot. crispus*, *Myriophyllum* sp., *Glyceria* sp.
	3				sand	*Eleocharis palustris*, occ. *Pot alpinus* and *Polygonum amphibium* ... ..
	4				stones and boulders in sand	*Littorella*, etc. ... ..
Gill	5	7·8	27·0	196	stones (granite) ...	coll. partly in *Phragmites* bed and partly on open shore with *Littorella* ... ..
	6				boulders and stones (limestone) on steep slope	none ... .
	7				stones	none ... .
	8				stones at edge, mud deeper	*Phragmites*, *Littorella*, *Elodea* and *Pot.* spp.
Arrow	9	8·2	41·1	245	sand	*Schoenoplectus lacustris*, *Eleocharis palustris*, etc. ..
	10				sand, some mud ...	wide zone of *Phragmites*, patches of *Littorella* ..
Glencar	11	7·9	34·3	223	stones	none ; zone of *Phragmites* yds. from lake edge ..
Erne	12	8·1	25·6	175	mud	Bay with *Carex elata* at edge and *Schoenoplectus lacustris* beyond ... .
	do.				stones	none ... .
	13				stones, occ. boulders	none ... .
Melvin	14	8·0	20·0	160	stones	*Littorella* ... .
	...				stones, some sand ...	patch of *Eleocharis palustris*..
Gara	15	8·4	51·5	306		thick *Phragmites* bed with *Pot. natans* on one side and flooded meadow on the other
	do.				stones	not rec. ... .

General data, Mollusca, and Crustacea.

MOLLUSCA																CRUSTACEA				
Theodoxus fluviatilis (L.)	*Valvata piscinalis* (Müll.)	*Bithynia tentaculata* (L.)	*Hydrobia jenkinsi* Smith	*Ancylastrum fluviatile* (Müll.)	*Physa fontinalis* (L.)	*Limnaea stagnalis* (L.)	*L. palustris* (Müll.)	*L. peregra* (Müll.)	*Planorbis contortus* (L.)	*Pl. complanatus* (L.)	*Pl. planorbis* (L.)	*Pl. carinatus* Müll.	*Pl. vortex* (L.)	*Pl. albus* Müll.	*Gammarus lacustris* Sars.	*G. duebeni* Lillj.	*G. tigrinus* Sexton	*Asellus aquaticus* L.	*A. meridianus* Rac.
–	–	–	–	–	±	±	±	±	–	–	–	–	–	–	0	0	0	0	0
–	–	–	+	–	+	+	–	+	–	–	–	–	–	2	–	–	++	10	–
–	–	–	+	–	+	–	–	+	–	–	–	–	–	–	–	–	+	1	–
–	–	–	+	0	+	+	+	+	–	–	–	–	–	1	–	+++	–	4	–
1	–	+	++	1	–	±	–	+	2	–	–	–	±	2	–	+	–	–	–
+	–	±	++	+	–	–	–	1	–	–	–	–	–	–	–	sp.	–	–	–
–	–	–	–	–	–	–	–	++	–	–	–	–	–	–	–	sp.	–	–	–
±	–	++	+++	–	–	–	–	±	–	–	–	–	2	2	–	±	–	sp.	
1	–	±	1	–	++	±	±	–	–	–	–	2	1	–	–	+++	–	++	–
–	–	–	–	–	+	–	–	–	–	–	–	–	2	–	–	sp.	–	sp.	–
1	–	–	–	–	–	–	–	+	–	–	–	–	–	–	–	±	–	–	–
–	±	–	+++	–	–	–	±	±	–	–	–		+	–				sp.	–
–	1	++	–	–	–	–	–	+	–	–	–	2	–	–	+	+		sp.	–
–	–	–	–	–	–	–	2	++	–	–	–	–	–	–				–	–
–	–	–	–	–	1	–	++	+++	–	–	–	±	–	–	–	+++	–	3	–
–	±	±	–	–	–	–	+	++	–	–	–	±	–	–	–	–	–	–	–
–	–	2	–	–	1	+	±	±	–	–	–	–	++	–	+	+	–	sp.	–
–	–	–	5	1	–			–	–	–	–	–	–	–	–	+	–	–	

TABLE 2—*continued.*

Lough	Station No.	pH	Ca mg/l.	Conductivity recip. meg.	Nature of bottom	Macrophytic vegetation
Talt	16	8·2	27·2	175	stones and boulders...	*Littorella*, occ. *Myriophyllum* sp., small tufts of *Chara* sp.
Conn	17	8·1	29·2	223	sand, some peat ...	*Phragmites*, *Littorella*, etc. ...
	18				stones	little, spp. not rec. ...
Carra	19	8·2	32·9	239	calcareous marl ...	thin *Phragmites bed* ...
Ree	20	8·7	29·9	196	isolated stones in sand	little, spp. not rec. ...
Sheelin	21	8·5	41·0	272	calcareous marl ...	*Schoenoplectus lacustris* and patch of *Pot. natans* ...
					stones	*Littorella* near edge, dense *Chara* sp. in water over 2 ft. deep ... ...
Oughter	22	8·2	40·2	272	mud	Water-lily, *Glyceria* sp., *Pot.* sp. ... ...
Derryadd	23	7·5	8·1	111	not rec., probably peat	coll. at edge of wide *Phragmites* bed fringing whole lake
Gartan	24	7·3	4·4	69	stones	*Littorella* ... ...
Veagh	25	6·8	1·4	59	stones, some sand ...	*Juncus bulbosus* ... ...
Awalie	26	5·1	2·0	114	stones and boulders ...	*Eleocharis multicaulis* and *Lobelia* in a small bay ...
Dunglow	27				peat	th. *Littorella* ... ...
Finn	28	6·8			stones, some gravel ...	*Littorella* ... ...
Mourne	29	6·4	1·1	49	stones, some sand ...	*Littorella*, etc.
Derg	30	6·8	1·9	54	stones on sand ...	*Eleocharis* sp., *Equisetum* sp., *Lobelia* and sparse *Phragmites* ... ...
Allen	31	7·5	7·7	88	boulders and stones ...	none ... ...
Furnace	32					th. *Phragmites* bed ...
Small lough near L. Furnace ...	33				boulders and stones ...	patches of *Lobelia*, *Isoetes* spp.

coll. = collection, occ. = occasional, *Pot.* = *Potamogeton*, rec. = recorded, th. = thick,
* on nearby stony shore.

General data, Mollusca, and Crustacea.

MOLLUSCA																CRUSTACEA				
Theodoxus fluviatilis (L.)	*Valvata piscinalis* (Müll.)	*Bithynia tentaculata* (L.)	*Hydrobia jenkinsi* Smith	*Ancylastrum fluviatile* (Müll.)	*Physa fontinalis* (L.)	*Limnaea stagnalis* (L.)	*L. palustris* (Müll.)	*L. peregeri* (Müll.)	*Planorbis contortus* (L.)	*Pl. complanatus* (L.)	*Pl. planorbis* (L.)	*Pl. carinatus* Müll.	*Pl. vortex* (L.)	*Pl. albus* Müll.	*Gammarus lacustris* Sars.	*G. duebeni* Lillj	*G. tigrinus* Sexton	*Asellus aquaticus* L.	*A. meridianus* Rac.
+	–	+	–	–	2	±	1	2	–	–	–	–	–	–	–	±	–	–	–
1	+	+	0	–	+	+	–	+	–	–	–	–	–	+	–	±	–	sp.	–
–	–	+	1	1	±	–	+	±	–	–	–	–	–	–	–	±	–	–	–
–	12	1	–	–	–	1	–	2	–	–	–	–	–	–	–	+++	–	–	–
–	1	7	±	±	1	1	±	±	–	–	9	13	±	1	–	++	–	0	0
–	±	±		–	1	++	–	+	–	–	++	++	–	–	–	±	–	–	3
++	+++	++	1	–	–	–	–	+	±	–	±	±	+	–	–	–	–	–	–
–	+++	+	+++	–	±	+	2	++	–	–	–	–	±	1	–	± *	–	11	–
–	–	–	–	–	+	–	–	+	–	+	–	–	–	–	–	–	–	sp.	–
–	–	–	–	0	–	–	–	1	–	–	–	–	–	–	–	++	–	–	–
–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–	++	–	–	–
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–	–
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
–	–	–	–	–	–	–	–	±	1		–	–	–	–	–	+	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	++	–	–	–
0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	±	0	0	0
–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	++	–	–	–
–	–	–	+++	–	–	–	1	±	–	–	–	–	–	–	0	0	0	sp.	–
–	3	–	–	2	–	–	–	2	–	–	–	–	–	–	–	2	–	–	5

Plant names are those of Clapham, Tutin, and Warburg's *Flora of the British Isles*. A trivial name or "sp." has been left out where the genus is monospecific or has only one aquatic species.

TABLE 3.—*Ephemeroptera.*

	Muddy bottom with vegn.	Calcareous marl and *Phragmites*	Peat and *Littorella*	Reed-bed on organic substratum						Reed-bed on sand			Stones and boulders embedded in sand				Stones and some *Littorella*						Stones, no vegetation						
Station No.	22	19	27	32	15	23	12	21	8	17	9	10	29	30	25	20	33	28	5	14	16	24	26	18	11	6	7	13	31
Siphlonurus linneanus (Etn.)	–	–	–	–	–	–	2	++	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Cloeon simile Etn.	sp	–	±	–	–	+	–	±	–	–	–	–	–	–	2	–	–	–	1	–	–	–	–	–	sp	–	–	–	–
Centroptilum luteolum (Müll.)	–	–	–	–	–	–	–	1	1	–	±	–	–	–	–	–	–	±	1	1	2	–	–	–	±	–	–	–	–
Ephemerella ignita (Poda) ...	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–.	–	–	–	1	–	–	–	–	–	–	±	–	+	–
Heptagenia lateralis (Curt.) ...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	±	–	–	–	–	–	–	–
H. sulphurea (Müll.)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	4	1	–	–	–	–	–	1	±
Ecdyonurus dispar (Curt.) ...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	±	±	±	–	+	–	+	–	+	sp	sp	–

TABLE 4.—*Heteroptera.*

Lough	Station No.	Conditions at station	*Corixa germari* (Fieb.)	*C. pearcei* (Walton)	*C. lacustris* Macan	*C. falleni* (Fieb.)	*C. praeusta* (Fieb.)	*C. concinna* * (Fieb.)	*C. distincta* (Fieb.)	*C. fossarum* (Leach)	*C. semistriata* (Fieb.)	*C. linnei* (Fieb.)	*C. scotti* (Fieb.)	*C. nigrolineata* (Fieb.)	*Glaenocorisa propinqua* * (Fieb.)	*Cymatia bonsdorffi* (C. Sahlb.)	*Notonecta glauca* L.	*N. maculata* F.	*Notonecta* nymphs
Neagh ...	1	stony bottom	20	–	–	–	2	2	–	–	–	–	–	–	–	–	–	–	–
	2	do.	14	–	–	–	3	–	–	–	–	–	–	–	–	–	+	–	–
	3	sandy bottom, with some vegetation	++	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Arrow ...	10	broad *Phragmites* bed on sand and mud ...	23	17	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
	9	reed-bed on sand	–	4	1	–	1	–	–	–	–	–	–	–	–	–	3	–	–
Ree ...	20	stony bottom behind reed-bed	–	60	–	–	2	–	–	–	–	–	–	–	–	1	–	–	–
Gill ...	5	reed-bed	8	10	–	–	1	–	9	–	–	–	–	–	–	1	–	–	–
	8	reeds and submerged vegetation	–	–	6	–	–	–	17	1	–	–	–	–	–	–	–	–	–
Conn ...	17	*Phragmites* bed on sand, some peat from erosion ...	4	1	3	–	–	–	6	1	–	–	2	–	–	3	–	–	–
Carra ...	19	*Phragmites* bed on marl ...	–	–	–	–	–	–	28	–	–	1	–	–	–	–	–	–	2
		large compact clump of *Chara* sp.	1	–	–	–	–	–	4	2	–	–	–	–	–	7	–	–	–
Sheelin ...	21	*Littorella* sward	1	–	4	–	–	–	5	1	–	–	–	–	–	–	–	–	–
		Reed bed and patch of *Pot. natans*	–	–	–	–	–	–	10	–	–	–	–	–	–	–	+	1	–
Erne ...	12	Bay with *Carex elata* and *Schoenoplectus lacustris* on a muddy bottom ...	–	3	–	–	1	–	20	–	15	–	–	–	–	5	–	–	–
Gara ...	15	thick *Phragmites* bed off flooded meadow ...	–	3	–	1	–	–	9	16	–	–	–	–	–	1	–	–	–
Derryadd ...	23	edge of wide reed-bed ...	–	–	–	–	–	–	–	–	–	18	2	–	–	1	–	–	–
Oughter ...	22	submerged vegetation on muddy bottom	–	–	–	3	–	–	–	–	–	–	–	–	–	–	–	–	–
Furnace ...	32	thick *Phragmites* bed ...	–	–	6	–	–	–	–	–	2	–	8	–	–	–	–	–	1
Finn ...	28	*Juncus bulbosus* on muddy bottom	–	–	–	–	–	–	–	–	–	–	10	1	–	–	–	–	–
Awalie ...	26	*Eleocharis* sp. and *Lobelia* among stones	–	–	–	–	1	–	–	–	–	–	3	–	–	7	–	–	+
Dunglow ...	27	*Littorella* on peat ...	–	–	–	–	–	–	–	–	1	–	3	–	–	–	–	–	–
Veagh ...	25	*Juncus bulbosus* on sand ...	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–
Mourne ...	29	do.	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–
		TOTAL	71+	98	20	4	11	2	108	21	18	19	29	1	1	27			
			8	7	5	2	7	1	9	5	3	2	7	1	1	9	3	1	3

* Times recorded (possible 23).

Not recorded in Ireland by Bedwell and Massee (1945) or Massee (1946), who give the most recent summary of the distribution of Heteroptera in the British Isles.

TABLE 5.

Ratio of the segments of the middle legs of female specimens.
The figures show the number of specimens falling into each category.

femur = 100.

	tibia										tarsus								
	42	43	44	45	46	47	48	49	50	51	30	31	32	33	34	35	36	37	38
C. falleni ...	2	2	8 *x*	3	4						3 *x*	5	5	5	1				
C. pearcei ...	1	5	7	5	9	8	2 *x*				4 *x*	19	11	3					
C. distincta				1	4	5	10	9	7 *x*	3			2	3	8	11	7	6 *x*	2

	claw											
	33	34	35	36	37	38	39	40	41	42	43	44
C. falleni ...					3	6	2 *x*	5	2	1		
C. pearcei ...	2	8 *x*	13	6	7	1						
C. distincta						2	7	9	10 *x*	5	3	3

TABLE 5.—*continued.*

tibia + tarsus + claw

	108	109	110	111	112	113	114	115	116	117	118	119
C. falleni ...					3	3	3	1	2	3	2	
C. pearcei ...	4		8		8	3	11		2	1		
C. distincta										1		

	120	121	122	123	124	125	126	127	128	129	130
C. falleni ...	2										
C. pearcei ...											
C. distincta	3	5	6	3	2	1	5	6	2	3	2

x = figure given by Walton, 1936.

Source of material

	CB	CU	KF	SR	WL	WW	Sweden.	CA	DM	NS	L. Arrow	L. Carra	L. Erne	L. Gara	L. Gill.	L. Ree	Total Specimens
C. falleni ...	7	3	1	1	3	1	3										19
C. pearcei ...											8	–	3	1	5	20	37
C. distincta	3			6	5			2	3	2		5	7	4	2		39

TABLE 6.

The upper of the two figures for each lake gives the number of species in the group concerned observed in one drop of the net plankton and 1 *ml. of the water collected; the lower (underlined) figure gives the number of organisms (Myxophyceae) or cells (the other groups) in* 1 *ml. of a surface water sample.*

LOUGH.	Myxophyceae	Bacillariophyceae	Chlorococcales (Chlorophyceae)	Desmidiaceae (Chlorophyceae)	'Flagellates'	Totals
Neagh outflow...	1	3	0	0	1	5
	15190	56	0	0	0	15246
Station 6 ...	–	–	–	–	–	–
	0	1	335	0	284	620
	–	–	–	–	–	–
Station 10 ...	8	5	3	0	7	23
	26	218	0	0	3	247
	–	–	–	–	–	–
Station 11 ...	3	4	3	0	7	17
	17	0	7	0	261	285
	–	–	–	–	–	–
Station 13 ...	4	5	4	4	5	22
	129	15	197	0	273	614
	–	–	–	–	–	–
Station 14 ...	9	2	2	4	1	18
	11	9	20	1	0	41
	–	–	–	–	–	–
Station 15 ...	4	6	2	0	6	18
	2	92	4	0	21	119
	–	–	–	–	–	–
Station 16 ...	3	1	0	1	2	7
	–	–	–	–	–	–
Station 17 ...	6	8	2	0	5	21
	4	100	1	0	36	141
	–	–	–	–	–	–

TABLE 6.—*continued.*

LOUGH.	Myxophyceae	Bacillariophyceae	Chlorococcales (Chlorophyceae)	Desmidiaceae (Chlorophyceae)	'Flagellates'	Totals
Station 19 ...	2	1	0	1	4	8
	1	25	0	0	24	50
	–	—	–	–	—	—
Station 20 ...	1	0	2	0	1	4
	–	–	–	–	–	–
Station 21 ...	5	3	0	0	4	12
	–	–	–	–	–	–
Station 22 ...	6	3	1	0	3	13
	–	–	–	–	–	–
Station 23 ...	–	–	–	–	–	–
Station 24 ...	0	2	2	0	1	5
	2	0	2	0	6	10
	–	–	–	–	–	—
Station 25 ...	2	3	2	8	3	18
	3	23	9	0	6	41
	–	—	–	–	–	—
Station 26 ...	0	1	0	2	1	4
	–	–	–	–	–	–
Station 27 ...	0	1	0	3	2	6
	–	–	–	–	–	–
Station 28 ...	2	1	0	6	2	11
	–	–	–	–	–	–
Station 29 ...	0	1	1	6	1	9
	–	–	–	–	–	–
Station 30 ...	0	1	0	1	1	3
	–	–	–	–	–	–
Station 31 ...	0	2	0	0	0	2
	–	–	–	–	–	–
Station 32 ...	0	1	2	2	0	5
	–	–	–	–	–	
Station 33 ...	–	–	–	–	–	–

TABLE 7.

Some of the more important planktonic algae identified and the loughs in which they occur.

	Loughs with > 20 *mg Ca per litre.*	*Loughs with* < 10 *mg Ca per litre.*
MYXOPHYCEAE :		
Anabaena catenula (Kütz.) Born. & Flah. var. *intermedia* Griff.	Oughter.	
Anabaena circinalis Rab.	Conn.	
Anabaena flos-aquae (Lyngb.) Bréb. ...	Arrow, Glencar, Erne, Melvin, Gara, Sheelin.	Gartan, Finn.
Anabaena spiroides Kleb.	Oughter.	
Aphanizomenon flos-aquae (L.) Ralfs ...	Oughter, Arrow, Erne.	
Aphanothece clathrata W. & G. S. West	Melvin, Sheelin.	
Aphanothece nidulans P. Richt. var. *endophytica* W. & G. S. West.	Arrow, Melvin, Talt.	
Coelosphaerium kutzingianum Naeg. ...	Arrow, Glencar, Gara, Talt ...	Veagh.
Coelosphaerium naegelianum Ung. ...	Arrow, Erne, Melvin, Conn, Sheelin, Oughter.	Finn.
Gloeotrichia echinulata (J. E. Sm.) P. Richt. ...	Oughter.	
Gomphosphaeria aponina Kütz ...	Carra.	
Microcystis flos-aquae (Wittr.) Kirchn. ...	Arrow, Melvin, Conn, Sheelin, Oughter.	
Oscillatoria agardhii Gom.	Neagh.	
,, ,, ,, var. *isothrix* Skuja.	Neagh, Glencar, Gara, Talt, Conn, Sheelin.	
Oscillatoria lacustris (Kleb.) Geitl. ...	Melvin.	
Oscillatoria limnetica Lemm. ...	Erne.	
Oscillatoria borneti Zukal	Conn.	
Phormidium mucicola Naum. & Huber-Pest.	Arrow, Melvin.	
BACILLARIOPHYCEAE :		
Asterionella formosa Hass.	Glencar, Erne, Gara, Talt, Conn, Sheelin, Oughter.	Gartan, Veagh, Awalie, Dunglow, Finn, Mourne, Derg, Furnace, Allen.
Cyclotella comensis Grun	Conn.	
Cyclotella comta (Ehr.) Kütz.	Neagh, Gill, Arrow, Erne, Gara, Conn, Sheelin.	
Cyclotella praetermissa Lund	Conn	Veagh.
Fragilaria crotonensis (Edw.) Kitton ...	Arrow, Glencar, Erne, Gara, Conn, Sheelin, Oughter.	
Melosira ambigua O. Müll.	Glencar, Conn.	
Melosira granulata (Ehr.) Ralfs ...	Arrow, Erne, Gara, Oughter.	
Melosira italica (Ehr.) Kütz., subsp. *subarctica* O. Müll.	Neagh.	Allen.
Rhizosolenia eriensis H. L. Smith ...	Conn.	
Rhizosolenia longiseta Zach	Conn.	
Stephanodiscus astraea (Ehr.) Grun. ...	Neagh, Conn.	

TABLE 7.—*Continued.*

	Loughs with > 20 *mg Ca per litre.*	*Loughs with* < 10 *mg Ca per litre.*
CHLOROPHYCEAE		
CHLOROCOCCALES SENSU LATO :		
Ankistrodesmus falcatus (Corda) Ralfs var. *acicularis* (A. Br.) G. S. West.	Erne.	
Ankistrodesmus falcatus (Corda) Ralfs var. *mirabile* W. & G. S. West.		Veagh.
Ankistrodesmus falcatus (Corda) Ralfs var. *spirilliformis* G. S. West.	Gill, Glencar, Erne, Melvin, Conn.	
Gemellicystis neglecta (Teil.) Skuja ...	Arrow, Glencar, Erne, Conn.	
Dictyosphaerium pulchellum Wood ...		Mourne.
Pediastrum duplex Meyen	Erne, Gara, Ree.	
Quadrigula pfitzeri (Chod.) G. M. Smith		Veagh.
Sphaerocystis schroeteri Chod. ...	Ree.	
Stylosphaeridium stipitatum Geitl. ...	Oughter	Gartan.
DESMIDIOIDEAE :		
Arthrodesmus incus (Bréb.) Hass ...		Mourne.
Closterium acutum Bréb. var. *variabile* (Lemm.) Krieg.	Erne.	
Cosmarium contractum Kirch. var. *ellipsoideum* (Elfv.) W. West.		Veagh.
Cosmocladium saxonicum De B. ...	Erne.	
Sphaerozosma aubertianum W. West var. *archeri* (Gutw.) W. & G. S. West.		Veagh.
Spondylosium planum (Wolle) W. West		Veagh.
Staurastrum anatinum Cooke & Wills		Veagh, Awalie, Dunglow, Finn, Mourne, Derg.
,, *curvatum* W. West ...		Veagh, Mourne, Furnace.
,, *dejectum* Bréb.	Carra.	
,, *furcigerum* Bréb. ...	Erne.	
,, *jaculiferum* W. West ...		Finn.
,, *longipes* (Nordst.) Teil. ...	Erne	Finn, Mourne.
,, *lunatum* Ralfs	Erne, Melvin	Veagh.
,, *paradoxum* Meyen ...	Arrow	Awalie.
,, *planktonicum* Teil. ...	Erne	Finn, Furnace.
,, *ophiura* Lund		Finn.
Xanthidium antilopaeum (Bréb.) Kütz. ...		Mourne.
,, *subhastiferum* W. West ...		Finn.
"FLAGELLATES" (Chloro- Chryso- and Dinophyceae) :		
Ceratium hirundinella O.F.M.	Arrow, Glencar, Gara, Conn, Carra, Sheelin, Oughter.	Veagh, Dunglow, Finn, Allen, Furnace.
Chrysococcus rufescens Klebs ...	Glencar.	
Dinobryon divergens Imhof	Arrow, Glencar, Gara.	
Eudorina elegans Ehr.	Arrow, Erne, Sheelin, Oughter.	
Volvox globator L.	Oughter.	