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THE TYPEFACE OF THE TITLE AND AUTHORS OF THE ARTICLE OVERLEAF IS FAINT. THEY SHOULD READ:

SOME OBSERVATIONS ON THE OCCURRENCE OF MACHAIR IN WESTERN IRELAND

J.R. Akeroyd and T.G.F. Curtis

SOME OBSERVATIONS ON THE OCCURRENCE OF MACHAIR IN WESTERN IRELAND.

J.R. Akeroyd and T.F.F. Curtis.

The sand dune grassland known as 'machair'* is principally associated with coastal ecosystems of the highlands and islands of Scotland, including Orkney and Shetland (Ritchie, 1967; Spence, 1979). In particular machair is the name given to the extensive dune pastures that are a distinctive feature of the landscape and vegetation of the Hebrides. However, machair can probably be used as a term to describe a range of grassland communities on stable dunes elsewhere in these islands (Ritchie, 1976).

During a visit to the Mullet peninsula, West Mayo, in late June 1979, we were struck by the apparent similarity of the dune grassland there to that described in published accounts of the Scottish machair. Other communities of this type had been noted by T.G.F.C. at Kincashlough, Co. Donegal in June 1978. Although similarities between dune grassland communities in Scotland and western Ireland have drawn the attention of a number of authors (e.g. Heslop-Harrison, 1949; Hepburn, 1966; Crofts, R.S. in Ritchie, *op.cit.*, Whittow, 1975, pp. 182-183), the term machair has not been generally applied to describe areas of dune grassland in Ireland. In this article we shall consider particular characteristics of the dune grasslands of western Ireland, particularly those of the Mullet peninsula, that suggest a floristic and ecological affinity with the machair of the Hebrides.

Ritchie (1976) has attempted to define machair on the basis of a suite of attributes in order to distinguish such communities from other types of dune grassland (Table 1). This scheme eliminates, for example, the grasslands that develop on stable dunes in England and Eastern Scotland, which contain a significant proportion of sand-binding species. Nevertheless, a precise definition is not easy to achieve, although, as Ritchie himself (*loc.cit.*) has remarked, these grasslands possess an "intangible landscape quality".

* The word 'machair' is derived from the Gaelic word 'magh', meaning a field or plain. In general it refers to an area of level, stable dune grassland, with a calcareous soil containing a high proportion of shell fragments. Machair is not exceptionally species-rich (Ranwell, 1974) and exacting calcicoles tend to be absent (Gimingham, 1974). An important aspect of these communities is their history of human influence through grazing and cultivation.

We shall now examine in turn the features of machair listed in Table 1 and assess the extent to which each might apply to the grassland of the Mullet peninsula and other sites in western Ireland. Figure 1 shows the geographical location of sites mentioned in the text.

CHARACTERISTIC FEATURES OF WESTERN IRISH DUNE GRASSLAND

1. Topography

The stable dune grassland of the Mullet peninsula forms a more or less level plain, in contrast to the hummocky topography of the unstable yellow dunes on the seaward margin of the dune system. Such a mature dune landscape consisting of extensive areas of blown sand, occurs just to the south and east of Annagh Head, at the northern end of the Mullet peninsula. Similarly, at Kincashlough there is an area of level dune grassland of this type between Mullaghderg Lough and the sand hills at the northern end of the dune system. Even where the ground is more undulating, as towards the zone of transition to actively accreting yellow dunes, the slopes are gentle and carry a complete cover of vegetation.

2. Soil

The soil of the dune grassland of the Mullet peninsula is calcareous. Table 2 lists pH values and calcium carbonate content of soil samples from three dune grassland sites in western Ireland, as compared with values cited in publications on Scottish machair sites. Despite the high level of variability, it is clear that calcium carbonate is usually a principal constituent of these soils. The two Co. Galway localities have very high pH and calcium carbonate levels, reflecting the fact that the beach at Dog's Bay is composed of foraminiferan tests as well as molluscan shells, while the beach sand at Bunowen has a large algal (Lithothamnion) limestone fraction.

3. Vegetation

Table 3 is based on data extracted from relevés we have taken in dune grassland in western Ireland. It will be apparent from the Table that Ammophila arenaria is the sole, sand-binding species present and moreover is of a low frequency of occurrence. Noteworthy, also, is the complete absence of Carex arenaria from the relevés. Although our sample number was small, it would appear that the western Irish dune grasslands we have

seen agree with the third characteristic of the machair listed by Ritchie (1976). It is of interest to note that the list of species given in Table 3 contains several which have been listed by Gimingham (1974) as being characteristic of Scottish machair (Table 3, footnote). This assemblage of species does not in itself categorise machair vegetation as these species are also frequently found in other base-rich grassland communities. Indeed this suite of species is present in most dune grasslands. However the basic composition of the western Irish dune grassland corresponds to Gimingham's scheme.

The overall impression gained by an observer in a site such as the Mullet dune grassland, is of a stable, herb-rich turf from which sand-binding species have been eliminated and which, in June, is a colourful display of flowers. The profusion of flowers in the Scottish machair has been stressed by several authors (e.g. Hepburn, 1966). Overgrazing may however greatly reduce the amount of flowering in some localities.

It is of interest to note that Koeleria macrantha, abundant on the Mullet peninsula and at Kincashlough (see Table 3), is an important constituent species of the machair of Tiree in the Hebrides (Vose, Powell and Spence, 1956).

4. Human influence

With the exception of the small area of marsh noted above, all the dune grassland site that we have visited in western Ireland are heavily grazed, mainly by cattle and to a lesser extent by horses. Even where larger domestic animals are excluded, as in certain portions of the grassland at Kincashlough, the pressure of grazing by rabbits ensures the persistence of a close sward.

A history of grazing has probably been of great significance in the evolution of dune grassland both in western Ireland and in western and northern Scotland, helping to create and maintain the characteristic close sward, as well as promoting the cycling of nutrients that might have been lost through leaching. The faeces of grazing animals assist the build-up of organic matter in the soil, a factor which ensures the retention of water and the binding together of the sand particles, thus reducing erosion.

At present and in contrast to the Scottish machair, there is little cultivation of dune grassland in Ireland. However, there are traces of

old potato ridges under the turf on the Mullet and potatoes are still grown on a small scale at Annagh Bay and at Kincashlough. As far as we are aware, the grasslands on the western Irish dunes are not cut for hay as animals are rarely excluded for periods long enough to allow the sward to grow.

5. Climate of the Region

The final point in Table 1 concerns the overall climate of the regions in which machair develops. Machair is a characteristic feature of coastal landscapes in areas that have a cool, moist Atlantic climatic regime, with strong winds throughout the year. The total annual rainfall at the Mullet (data of Belmullet meteorological station), between 1957 and 1977 ranged from 923.6 mm to 1,260 mm (mean 1120 mm) which compares with a mean annual rainfall of 1,100 mm in the Monach Isles (Randall, 1976) and 1,270 mm on Tiree (Vose, Powell and Spence, 1956). Relative humidity is more or less constant (c.80%) throughout the year. Frost is rare: a mean number of 17.9 days a year have a temperature of less than 0°C. Conversely, the mean daily maximum temperature is 12.5°C (compared with, for example, 11°C in the Monach Isles (Randall, loc.cit.). Strong winds are frequent and gales occur throughout the year.

From the above observations it will be apparent that the dune grasslands of the west of Ireland correspond closely to the machair of Scotland as defined by Ritchie (1976). However, before concluding that it would be appropriate to use the term machair to describe these grasslands, we shall consider in the next section some of the floristic features that they share with Scottish machair.

FLORISTIC COMPARISONS

There are considerable floristic as well as vegetational similarities between the Scottish machair and the dune grasslands of the west of Ireland. In his analysis of Scottish machair vegetation Gimingham (1974) appended four accessory categories of plants to his list of machair species, viz. orchids, marsh plants, annual species and arctic-alpines. The first two groups are a feature of the Mullet and Kincashlough floras and indeed a profusion of orchid species contributes much towards the colour of the June floral display.

One of the most interesting orchids of machair is an ecotype of

Dactylorhiza fuchsii, a variant that is viewed by some authors to be taxonomically distinct (ssp. hebridensis) but is probably best treated as a variety. Although it is not restricted to machair, occurring also on cliff-tops in Cornwall (Heslop-Harrison, 1954), it is sufficiently widespread in Hebridean machair communities (Heslop-Harrison, 1948, 1949), and in dune grassland in western Ireland, for it to be viewed as a characteristic species of this type of habitat. It differs from ssp. fuchsii in having short stems and leaves and a squat, dense spike of dark pink flowers. The dwarf habit is probably an adaptation to the severe exposure to wind in the sites at which it occurs. At Kincashlough it is restricted to the level pasture behind the dunes, but in the Mullet peninsula it also occurs commonly on roadside banks.

A dwarf, red-flowered variant of Dactylorhiza incarnata, ssp. coccinea, is abundant in the damper areas of the dune pasture of the Mullet and Kincashlough. This plant is a typical member of the flora of the slacks and hollows of the Hebridean machair. Three other orchids also present in some quantity at the Mullet and Kincashlough are Coeloglossum viride, Listera ovata and Dactylorhiza majalis ssp. purpurella. These are not necessarily restricted to the hollows in the pasture, but are commonly encountered elsewhere on the grassland plain. As they are, to some extent, moisture-loving species, their occurrence here suggests that the water table lies close to the sand surface.

Areas of marsh, together with lakes, are a feature of the Hebridean machair, the level sand surface often indicating that the sand has eroded down to the water table. Steers (1973) has emphasised this fact, noting that in winter much of the low-lying machair is flooded. Marshes and lakes, with their associated flora, are also a feature of western Irish dune grassland and are an integral part of the grassland vegetation.

Machair marsh communities are not necessarily associated with lakes but are frequently found amongst the grassland, where the sand has been sufficiently eroded to form a level surface at the water table. In most cases, like the surrounding grassland, these marsh communities are heavily grazed, as at Kincashlough. But where animals have been excluded, as at Annagh on the Mullet peninsula, a rich calcicolous marsh flora develops. Although dominated by sedges, this community is notable for its spectacular display of flowers, with Parnassia palustris in some quantity and Cardamine pratensis, Lychnis flos-cuculi and Pinguicula vulgaris amongst the more conspicuous

species present.

Especially notable is the occurrence of Dactylorhiza traunsteineri in the marsh community at the Mullet, in a locality so far west and in close proximity to the sea. However, this species may possibly occur in similar areas adjoining the Hebridean machair (Curtis and Webb, in prep.), although its presence there had been undetected by other authors. Again one observes a floristic similarity between the dune grassland of western Ireland and western Scotland.

Annual species are a prominent element of any dune flora and a number occur in the dune grassland of the Mullet peninsula, such as Aira praecox, Erophila verna, Geranium molle and Saxifraga tridactylites. Arctic-alpine species, including for example Dryas octopetala, are a feature peculiar to the machair of northern Scotland. It is, however, worth recording that Empetrum nigrum, a species of montane affinity, occurs on several western Irish dune systems, particularly on the edge of the dune pasture at Kincashlough. Here also grows a prostrate variant of Juniperus communis: although this species occurs in maritime habitats elsewhere in these islands.

One aspect of climatic influence on the flora of dune grassland in western Ireland is the absence of a number of exacting calcicole species which occur commonly on many English and Eastern Scottish dune systems. The Scottish machair also lies outside the range of distribution of many of these calcicolous species, although they are replaced in northern Scotland by base-demanding arctic-alpines such as Dryas octopetala and Oxytropis halleri. The presence of species in this category, such as Anacamptis pyramidalis, Asperula cynanchica, Blackstonia perfoliata and Spiranthes spiralis, in the dune grasslands of Co. Galway perhaps indicates an affinity of these sites with the more southern and eastern dune systems both in Ireland and in Britain.

CONCLUDING REMARKS

In the ultimate analysis, machair would seem to be specifically and intimately associated with the Gaelic-speaking culture of the north and west of these islands. The Gaels of the Hebrides gave this vegetation its name and it has been the influence of the local culture on these grasslands that has given the vegetation so much of its character. Both the western Irish and Scottish dunes have been farmed for centuries by smallholders,

members of closely-knit communities, practising an agricultural system based on grazing and the cultivation of potatoes on the dune grassland. In many cases a consequence of the community structure of these areas has been that land ownership has been strictly controlled, so that each smallholder receives an equal allocation of the good land for cultivation and for grazing his animals. The characteristic field patterns of these areas tend to consist of parallel strips of land of approximately the same length and breadth as each other. This feature is particularly well marked in the Mullet peninsula (Whittow, 1975, pp. 182-183).

Thus in the western fringes of both Scotland and Ireland, a type of dune grassland has evolved that possesses a unique combination of attributes, as we have indicated in the evidence presented above. It seems appropriate therefore to apply the term machair to many areas of dune grassland in western Ireland, at least north of Galway Bay. We have pointed out some floristic similarities between Scottish and Irish machair sites, but what is now required is an extensive programme of phytosociological study, involving the co-operation of British and Irish botanists. It may well be that the machair communities of these islands are not all homologous. Nevertheless, they form a cohesive vegetation group with closer affinities to one another than to the dune grasslands of England, Wales and eastern Scotland.

ACKNOWLEDGEMENTS

We should like to thank H.N. McGough, who helped us with our field work in the Mullet peninsula; N. Allott and F. Bailey (Environmental Sciences Unit, T.C.D.), who kindly analysed our soil samples and Professor W.A. Watts who provided a generous contribution to our expenses in the field from Botany School funds; R. Young and D.S. Ranwell who commented on an earlier draft of the paper. The field work was carried out during the tenure of a research studentship (T.G.F.C.) and a research fellowship (J.R.A.) financed by the Department of Education, to whom we are grateful.

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TABLE 1

Characteristic attributes of machair (after Ritchie, 1976)

1. Mature coastal sand-dune phase, with more or less level surface.
2. Significant proportion of shell fragments in the sand, producing a lime-rich soil (pH>7).
3. Grassland vegetation with a low frequency of sand-binding species.
4. Human interference, principally by grazing, during the recent historical period.
5. Moist, cool, oceanic climate.

TABLE 2

pH values and calcium carbonate content (%) of soil samples from western Irish and Scottish dune grasslands. (For geographical location see Figure 1).

<u>LOCALITY</u>	<u>pH</u>	<u>% CaCO₃</u>
a) <u>W. IRELAND</u>		
<u>Mullet Peninsula, Co. Mayo</u>		
dune grassland	7.6	37
eroding dune grassland	8.1	16
<u>Bunowen, Knock Head, Co. Galway</u>		
dune grassland	7.7	69
yellow dune	8.5	70
<u>Dog's Bay, Co. Galway</u>		
eroding dune grassland	8.1	78
b) <u>SCOTLAND (HEBRIDES)</u>		
Barra, machair: McLeod (1949)	7.8	-
Harris, Machair: Gimingham <u>et al.</u> (1949)	7.2-7.6	49
Monach Isles, machair: Randall (1976)	7.2	41.1
South Uist, machair: Ritchie (1967)	-	1.6-53.9
Tiree, machair: Vose <u>et al.</u> (1956)	6.8-7.8	38.7-58.0

TABLE 3

Data from seven relevés recorded in dune grassland in western Ireland: species occurring in three or more relevés.

Species	Locality						
	Mullet: eroding grassland	Dog's Bay: eroding grassland	Mullet: grassland	Bunowen: grassland	Kincashlough: grassland	Rosapenna: damp grassland	Mullet: marsh in grassland
<u>Festuca rubra</u> *	+	+	+	+	+	+	+
<u>Rumex hibernicus</u> †	+	+	+	+	+		+
<u>Ranunculus bulbosus</u>	+	+	+	+		+	
<u>Trifolium repens</u> *	+	+	+	+		+	
<u>Bellis perennis</u> *		+		+	+	+	+
<u>Galium verum</u> *	+		+	+		+	
<u>Plantago lanceolata</u> *	+		+	+		+	
<u>Koeleria macrantha</u>		+	+			+	+
<u>Poa subcaerulea</u>	+	+			+		
<u>Ammophila arenaria</u>	+		+			+	
<u>Senecio jacobaea</u>	+			+		+	
<u>Cerastium atrovirens</u>		+	+	+			
<u>Luzula campestris</u>		+	+	+			
<u>Hypochoeris radicata</u>		+	+		+		
<u>Lotus corniculatus</u> *		+	+			+	
<u>Thymus praecox</u>		+	+			+	

* Species listed by Gimingham (1974) as having 'highest constancy' in Scottish machair; together with Achillea millefolium, Euphrasia nemorosa (Both recorded in Bunowen relevé) and Rhytidiadelphus squarrosus.

† A segregate of R. acetosa (Rechinger, 1961), at present being investigated by J.R.A.

FIGURE 1A.

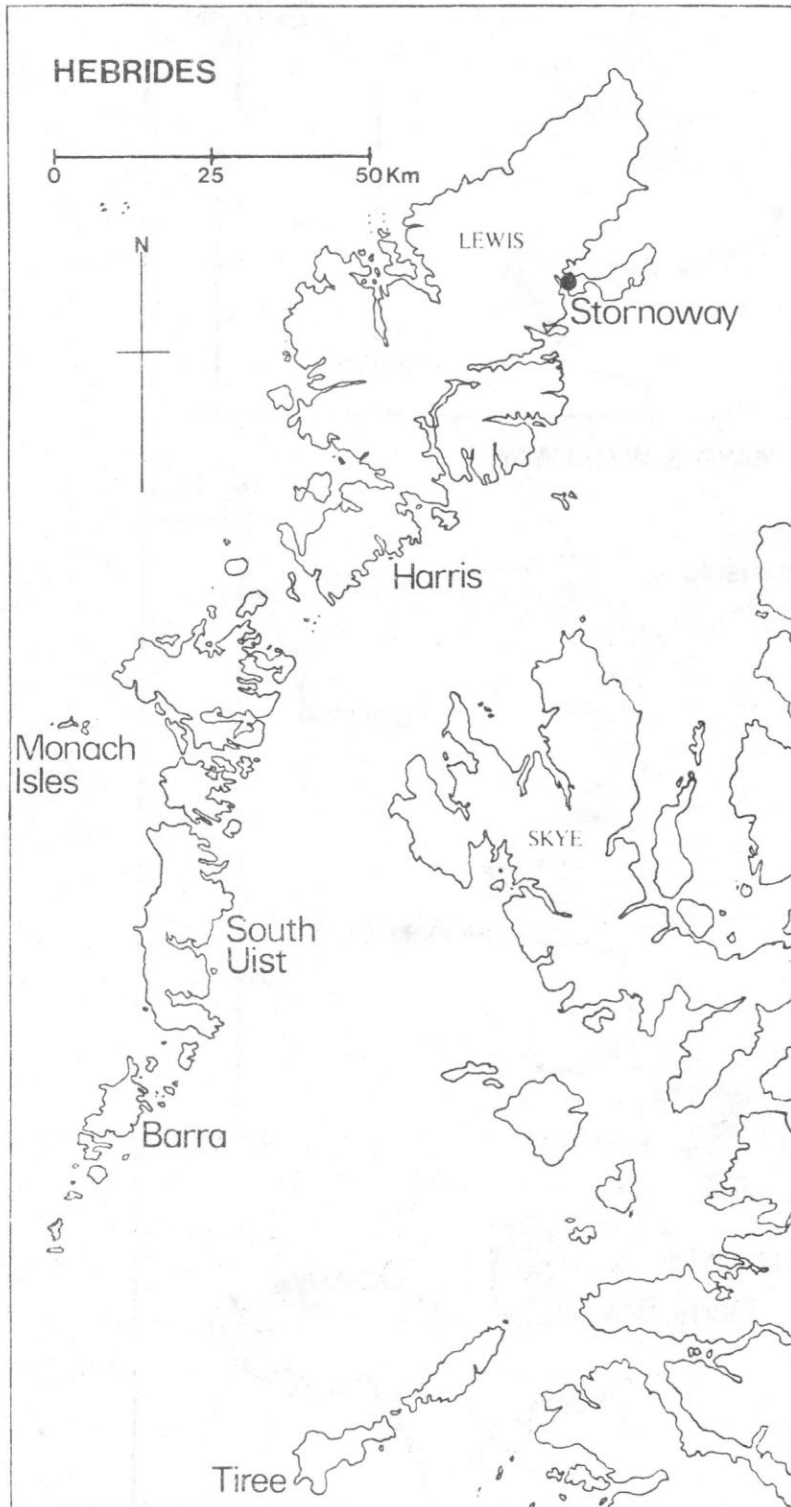
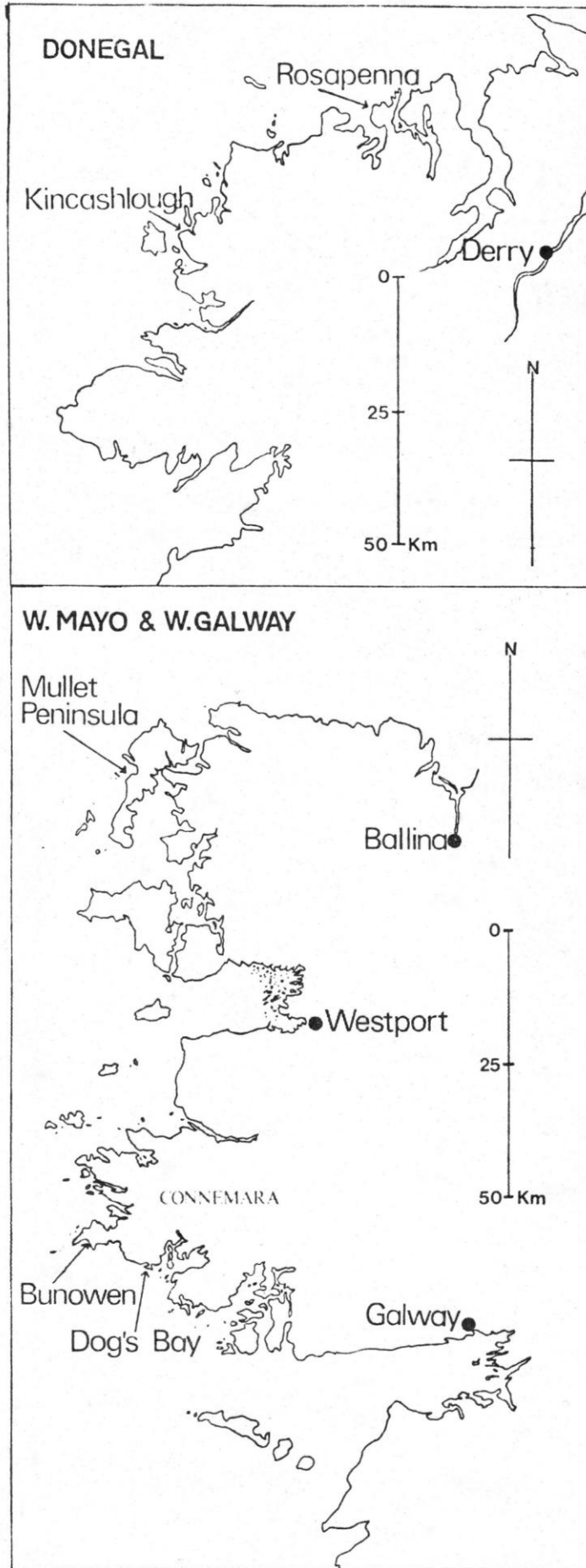


FIGURE 1B.



DISTRIBUTION RECORDS OF ORTHOPTERA (INSECTA) FROM IRELAND

Donald C.F. Cotton

A substantial amount of unpublished data on the distribution of the Irish Orthoptera has been collated to form this paper. Records for 4 species of cockroach, 1 species of cricket, 2 species of bush-cricket, 4 species of grasshopper and 2 species of ground-hopper are presented from a total of 20 counties. These data include many new vice-county records which have been ignored because this system of presenting species distributions lacks precision and is very often misleading for invertebrate recording schemes. Instead, records are accompanied by an Irish Grid reference which locates the observation to within the area of a 1 km grid square. To group the data into manageable blocks they are presented by species and are further sub-divided after alphabetically-sequenced county names.

Several people have very generously contributed records and the following codes have been adopted to identify the source of each observation: Don C.F. Cotton (DC), Declan Doogue (DD), Des G.F. Higgins (DH), Paul T. Harding (PH), Ciaran D. O'Flanagan (CoF), Jim P. O'Connor (JoC), Martin C.D. Speight (MS) and Michael de Courcy Williams (MdeCW). All collectors used Ragge (1965) for guidance when identifying their specimens, and through close co-operation it has been possible for either MS or DC to check determinations of specimens for all of the records presented herein.

Family BLATTIDAE

Periplaneta americana (L.)

DUBLIN: tea warehouse, Inchicore O 1133, 3 Feb. 77 DC.

Periplaneta australasiae (Fab.)

DUBLIN: around hot water pipes in tropical house, Botanic Gardens, Glasnevin O 1537, 23 Mar. 77 DC & DD.

Blatta orientalis L.

DUBLIN: school basement, Marino O 1836, Sept. 76 DH;
around hot water pipes in tropical house, Botanic Gardens,
Glasnevin O 1537, 23 Mar. 77 DC & DD;
S. Circular Road, Dublin 8 O 13, 7 Oct. 79 JoC.

MAYO: inside house, Louisburgh L 8181, July 76 DH.

Family PSEUDOMOPIDAE

Blatella germanica (L.)

DUBLIN: inside house, Santry O 1639, 21 Sept. 77 DC.

Family MECONEMATIDAE

Meconema thalassinum (De Geer)

GALWAY: beaten from oak, deciduous woods, Garryland Wood
M 4103, 7 July 78 MS.

KERRY: Killarney 1 Sept. 20 E.F. Bullock collection in the
National Museum of Ireland;
Kenmare Demense, Killarney July 27 E.F. Bullock
collection in the National Museum of Ireland;
Ross Wood, Killarney 19 Sept. 31 E.F. Bullock
collection in the National Museum of Ireland;
on oak, edge of oak woods, Tomies Wood, Lough Leane
V 9088, 26 June 75 MS.

Family TETTIGONIIDAE

Leptophyes punctatissima (Bosc)

DUBLIN: on leaf of Acer pseudoplatanus L. at woodland edge,
one female, Loughlinstown Common O 2423, 15 Aug. 74
MdeCW;
one female in conservatory of private house on the
southern cliffs above Broad Strand, Baily, Howth
O 2836, 13 Oct. 76 DH, PH and DD;
young nymphs feeding on Ranunculus petals, woodland
path, Loughlinstown Common O 2423, 10 June 79 MdeCW.

WICKLOW: males and females beaten from Salix/Fraxinus/Ulmus
scrub in deciduous woods, Knocksink Wood O 2117,
16 Aug. 76 MS;
beaten from Salix in young deciduous woods, Knocksink
Wood O 2117, 15 Sept. 79 MdeCW.

Family GRYLLIDAE

Acheta domestica (L.)

KERRY: Flesk House, Killarney V 98, Apr. 42 E.F. Bullock
collection in the National Museum of Ireland.

Family ACRIDIDAE

Stethophyma grossum (L.)

- CORK: two colonies containing "purple" variety of the female found in sheltered Molinia bogs in the centre of low-level deciduous and mixed woods, Glengarriff Forest V 9157, 26 July 76 MS;
Glengarriff Forest V 9257, Aug. 78 DH.
- GALWAY: on Molinia covered south-facing slopes around shore of Lough Inagh L 8349, 20 July 75 MS;
on Molinia covered slopes, Derryclare Wood L 8349, 26 July 78 MdeCW.
- KERRY: bog pond, Derrycunihy, near Galway's Bridge, Killarney V 9080 E.F. Bullock collection in National Museum of Ireland.

**

Omocestus viridulus (L.)

- CLARE: limestone grassland, Corofin R 2988, 29 June 75 MdeCW;
mixed woods on limestone pavement R 3485, 5 July 78 MS.
- CORK: Molinia bog, Glengarriff Forest V 9157, 26 July 76 MS;
Glengarriff Forest V 9257, Aug. 78 DH;
rough pasture, Cape Clear V 9622, 2 Aug. 79 CoF;
Barley Cove V 7626, 7 Aug. 79 CoF;
Sherkin Island W 0124, 19 Aug. 79 DH.
- DONEGAL: salt marsh grassland C 0834, 10 Aug. 78 MS.
- DUBLIN: Portrane O 2452, Aug. 75 DH;
Seafield O 2048, 7 July 77 DC;
Rush O 2553, 7 July 77 DC;
Royal Canal bank, Clonsilla O 0537, 9 July 77 DC;
quarry on Howth O 2639, 11 July 77 DC & DD;
Malahide Estuary O 1947, 12 July 77 DC;
old pasture near Rathcoole N 9924, 15 July 79 DC;
meadow at Daws Bridge O 1951, 23 July 79 DC;
rough pasture with Juncus and bracken near Cruagh Mountain O 1421, 25 July 79 DC;
meadow near Donabate O 2050, 27 July 79 DC;
hillside with bracken, Calluna and bare ground, Ben of Howth O 2838, 4 Aug. 79 DC;

- Knock Lake shore near Balrothery O 1961, 6 Aug. 79 DC;
bank of Royal Canal near Clonsilla O 0438, 25 Aug. 79 DC;
bank of R. Tolka near Mulhuddart O 0740, 25 Aug. 79 DC;
rough hill pasture, Knockannave O 0723, 27 Aug. 79 DC;
marsh by stream, Glencree O 1615, 27 Aug. 79 DC;
Bog of the Ring rough pasture, near Balrothery O 1859,
28 Aug. 79 DC.
- GALWAY: dry grassland at lake-side M 8803, 11 July 76 MS;
mixed woods on limestone pavement, Garryland Wood M 4103,
4 June 78 MS.
- KERRY: grass along road verge, Cready V 9472, 30 June 76 MdeCW;
track through young conifer plantation on valley bog
V 8362, 27 July 76 MS.
- KILDARE: Ballymore Eustace N 9210, 12 Sept. 76 DH;
Newbridge Fen N 7715, 20 June 78 MS;
grassland near Leixlip N 9936, 30 Aug. 79 DC.
- KILKENNY: swept from roadside vegetation, Lyeath Estate S 5355,
5 Aug. 78 MdeCW.
- LAOIS: Derry Hills N 2612, Aug. 76 DH;
trackside through mixed woods N 5705, 4 Aug. 78 MS.
- MAYO: near shore of Newport Bay L 9296, 31 July 77 DC;
near shore of Lough Feeagh F 9703, 30 July 77 DC;
near shore of Lough Cullin G 2204, 1 Aug. 77 DC;
Lough Carra M 17, 15 July 76 DH.
- WESTMEATH: near Ballynafid N 4160, 29 July 77 DC;
shore of Lough Derravaragh N 3968, 9 Sept. 79 DC;
Lough Ennell shore N 3944, 9 Sept. 79 DC.
- WICKLOW: Murrough Marshes O 3103, 22 July 78 MdeCW;
meadow in Avondale Forest Park T 1985, 24 Aug. 78 MS;
disused railway line near Loughlinstown O 2422, 12 July 79 DC;
rough pasture with Juncus, Glencullen O 1719, 12 July 79 DC;
rough pasture with bracken beside Lower Lough Bray O 1316,
26 July 79 DC;
Boleyhorrigan Bridge near Lough Tay O 1608, 26 July 79 DC;
bog near Boley S 9671, 28 July 79 DC;
near Kilquiggin S 9572, 29 July 79 DC;

peat bog near Kilcarney T 0483, 29 July 79 DC;
rough pasture in Glenmalure T 0793, 29 July 79 DC;
bog with Juncus near Laragh T 1392, 29 July 79 DC;
Enniskerry O 2217, 12 Aug. 79 DC;
marshy pasture field near Mizen Head T 2980, 18 Aug. 79 DC;
sand dunes at Mizen Head T 2979, 18 Aug. 79 DC;
Brittas Bay T 3285, 18 Aug. 79 DC;
rough pasture, north end of Broad Lough T 3098, 18 Aug. 79 DC;
heathland, Bray Head O 2817, July 79 DH.

Chorthippus brunneus (Thunberg)

- CORK: Molinia bog within deciduous woods V 9157, 26 July 76 MS;
Glengarriff Forest V 9257, Aug. 78 DH;
on stone walls, Cape Clear V 9622, 2 Aug. 79 CoF;
Barley Cove V 7626, 7 Aug. 79 CoF;
Sherkin Island W 0124, 19 Aug. 79 DH;
vegetated sea cliffs, Ballycotton W 9963, 23 Sept. 79 DC.
- DUBLIN: quarry at Sutton, Howth O 2639, 11 July 77 DC & DD;
Malahide Island O 2346, Aug. 75 DH;
Portrane O 2452, Aug. 75 DH;
salt marsh on Bull Island O 2337, 22 July 79 DC;
weedy waste ground with bare patches of gravel, Belfield
O 1830, 24 July 79 DC;
waste ground with weeds and stoney areas, near Mulhuddart
O 0740, 1 Aug. 79 and 25 Aug. 79 DC;
stoney wasteground with weeds, Booterstown Marsh O 2030,
10 Aug. 79 DC;
vegetation on low sea cliffs, near Bray O 2619, 12 Aug. 79 DC;
marsh by stream, Glencree O 1615, 27 Aug. 79 DC;
Bog of the Ring near Balrothery O 1859, 28 Aug. 79 DC;
north end of Sandymount Strand O 1933, 14 Sept. 79 DC.
- GALWAY: sparse grassland on limestone pavement M 4103, 6 Aug. 76 MS.
- KILDARE: Ballymore Eustace N 9210, 12 Sept. 76 DH;
Hill of Allen N 7620, Aug. 75 DH.
- LAOIS: Derry Hills N 2612, Aug. 76 DH.
- LOUTH: shore of Boyne Estuary O 1276, 15 Sept. 79 DC.

- MAYO: Lough Carra M 17, 15 July 76 DH;
shore of Lough Feeagh F 9703, 30 July 77 DC;
shore of Newport Bay L 9296, 31 July 77 DC.
- MEATH: shore of Boyne Estuary O 1175, 15 Sept. 79 DC.
- WESTMEATH: shore of Lough Ennell N 3944, 9 Sept. 79 DC.
- WEXFORD: sand dune slack T 1124, 2 July 76 MS;
shore of Lady's Island Lake T 1004, 26 Aug. 79 DC;
Hook Head X 7497, 30 Sept. 79 DC.
- WICKLOW: trackside in deciduous woods O 2117, 16 Aug. 76 MS;
meadow clearing in mixed woodland, Avondale Forest Park
T 1985, 24 Aug. 78 MS;
dune slack near Arklow T 2574, 8 July 79 CoF;
bank of Derry River near Shillelagh S 9968, 28 July 79 DC;
rough pasture in Glenmalure T 0793, 29 July 79 DC;
marshy pasture field near Mizen Head T 2980, 18 Aug. 79 DC;
dune slack Mizen Head T 2979, 18 Aug. 79 DC;
Brittas Bay T 3285, 18 Aug. 79 DC;
rough pasture at north end of Broad Lough T 3098, 18 Aug. 79 DC;
top of pebble beach amongst weeds, Kilcoole O 3106, 6 Sept.
79 DC.

Myrmeleotettix maculatus (Thunberg)

- CLARE: rough grazing by pond on limestone pavement R 2994, 27 June
75 MS;
rough grazing at edge of valley bog R 3391, 3 July 76 MS.
- CORK: firebreak in conifer plantation R 6214, 26 June 75 MS;
Glengarriff Forest V 9257, Aug. 78 DH;
behind sand dunes at Barley Cove V 7626, 7 Aug. 79 CoF;
Sherkin Island W 0124, 19 Aug. 79 DH;
dune slack, Ballycotton Bay W 9966, 26 Aug. 79 CoF.
- DUBLIN: hillside with heather, bracken and bare patches, Ben of
Howth O 2838, 4 Aug. 79 DC.
- GALWAY: boggy moorland with Molinia, Erica and Calluna M 5501,
6 Aug. 76 MS.
- LAOIS: Derry Hills N 2612, Aug. 76 DH.
- MAYO: edge of moorland at lake shore, Nephin Beg Range
F 9703, 31 July 77 DC.

WICKLOW: hillside above upper lake, Glendalough T 0997, 29 July 79 DC;
Bray Head O 2817, July 79 DH;
Ammophila dunes in blow-outs T 2979, 29 Aug. 79 MS.

Family TETRIGIDAE

Tetrix undulata (Sowerby)

CLARE: poor fen/valley bog R 3291, 22 June 77 MS;
limestone pavement and scrub R 3298, 22 May 78 MS;
rocky/muddy limestone lake shore with mixed deciduous wood
surrounds, Dromore Forest Park R 3487, 5 July 78 MdeCW;
Lough Goller R 1296, 20 June 79 DH.

DONEGAL: marsh adjacent to Lough Eske G 9683, 3 June 78 DC.

GALWAY: on bare peat at lake edge L 7735, 23 May 74 MS;
boundary of lake edge and deciduous woods L 8349, 24 May 74 MS;
on rough track running through rough grassland near lake
M 2237, 28 March 75 MS;
swept from vegetation in lakeside fen M 8303, 11 July 76 MS;
boundary of deciduous woods and turlough M 4103, 30 Aug. 77 MS.

KERRY: nymphs around base of Erica growing at rocky lakeside,
Long Range lake V 9388, 2 Apr. 78 MdeCW.

KILDARE: fen meadow N 7715, 20 June 78 MS.

LAOIS: track in mixed woods situated on drained valley bog N 5705,
4 May 77 MS;
patch of bare peat by track N 5705, 19 July 79 MS.

LEITRIM: lakeside pasture N 0489, 15 July 78 MS.

MAYO: grassland by lake M 1876, 8 May 75 MS;
by mountain stream in scrub woodland, Nephin Bog Range
F 9703, 1 Aug. 77 DC.

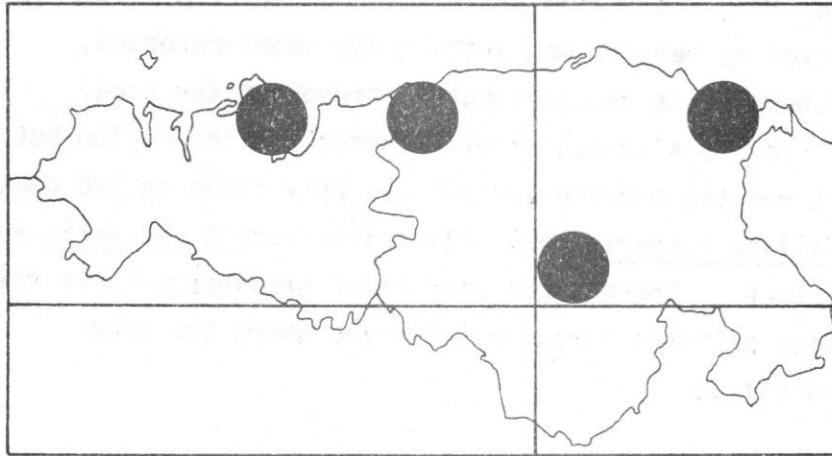
WICKLOW: beside path in well-drained deciduous woods O 2117,
20 Mar. 75 MS;
meadow in Avondale Forest Park T 1985, 24 Aug. 78 MS;
gravel bar at edge of Avonmore River, Annamoe T 1799,
7 July 79 DC.

Tetrix subulata (L.)

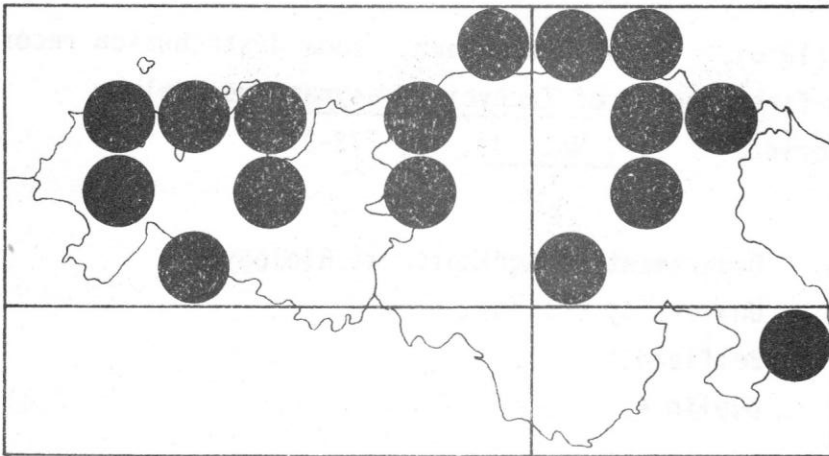
- CARLOW: swept from lakeside vegetation S 7380, 5 May 76 MS.
- CLARE: swept from vegetation of oligotrophic fen R 3487,
20 Apr. 76 MS;
poor fen/valley bog R 3291, 22 June 77 MS;
rocky/muddy shore of limestone lake with deciduous wood
surrounds, Dromore Forest Park R 3487, 5 July 78 MdeCW.
- DUBLIN: on bare ground beside Grand Canal, Clondalkin O 0-3-
27 Apr. 75 MdeCW.
- GALWAY: in cattle-churned damp grassland by lake M 2237, 28 Mar. 75 MS;
under Salix bushes at turlough edge M 4103, 9 May 75 MS.
- KILDARE: fen meadow N 7715, 20 June 78 MS.
- LAOIS: on path in fen woodland S 3380, 15 Apr. 77 MS;
on bare peat of cut-over valley bog N 5207, 3 June 79 MdeCW.
- LONGFORD: lake shore N 0882, 16 July 78 MS.
- MAYO: swept in marsh by lake M 1876, 9 May 75 MS.
- MEATH: on bare patches of clay soil in poorly drained pasture
N 9965, 9 Apr. 77 MS (MS also noted that the warmth of
this sunny day caused the insects to become very active
and make jump-glides of 2-2.5 m).
- OFFALY: on bare peat beside wet ditch in valley bog N 5623,
6 June 76 MS.
- ROSCOMMON: lake edge M 9949, 20 June 76 MS;
lake edge N 0055, 20 June 76 MS.
- WESTMEATH: lake edge N 0446, 19 June 76 MS.
- WICKLOW: shore of Blessington Reservoir N 9610, 12 Sept. 76 DH;
roadside verge by coastal fenland, Murrough Marshes
O 3103, 22 July 78 MdeCW.

A significant proportion of the data were systematically collected from counties Dublin and Wicklow during the summer of 1979 whilst making a comprehensive survey of the Odonata. Records for the 3 species of grasshopper are particularly numerous and these have been plotted in Figure 1, with the addition of a few records from Speight (1976).

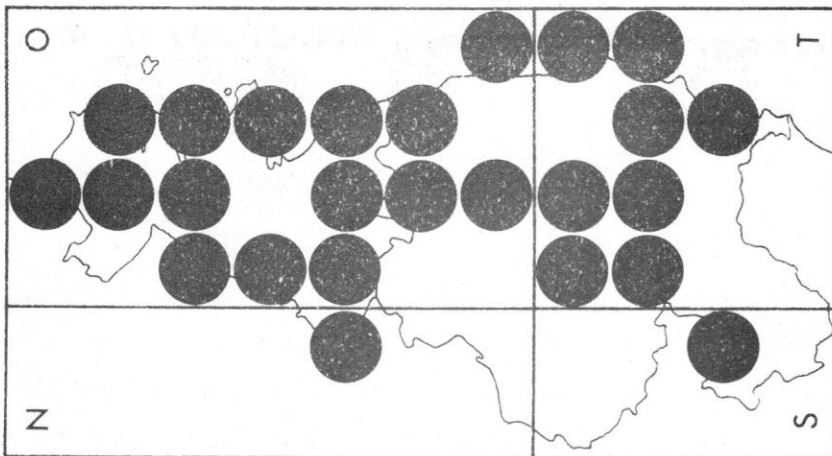
O. viridulus (Fig. 1a) is by far the most numerous species; it was found



c) Myrmeleotettix maculatus



b) Chorthippus brunneus



a) Omocestus viridulus

Figure 1. The recorded distribution of the Acrididae (grasshoppers) in Dublin and Wicklow.

in a wide range of grassy habitats and is distributed throughout the area. C. brunneus (Fig. 1b) has a preference for drier places, and being more restricted by habitat was undoubtedly under-recorded, although the map shows it to be distributed throughout the area. M. maculatus (Fig. 1c) is also distributed throughout the region but has even more distinct habitat preferences and was only found on two coastal heathlands with Calluna vulgaris, one inland site with C. vulgaris and in one area of dune-slack. These three species of grasshopper have rather similar distribution patterns throughout Ireland where the same generalizations hold true.

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ADDENDUM

**Family ACRIDIDAE

Stethophyma grossum (L.)

MAYO: peat bog, Nephin Beg Range F 9704, 31 July 77 DC.

FLORISTIC NOTES FROM CO. DUBLIN (H21)

Peter H. Carvill

Introduction

Since 1970 I have examined the flora of the area to the east of the Three Rock Mountain, Co. Dublin. The notes below are based largely on my records from this area. In addition, some records from other parts of the county are included.

Nomenclature and order of species is in accordance with Scannell and Synnott (1972), unless the species is not listed there, when nomenclature follows Tutin et al. (1964, 1968).

The symbols before the species names indicate the following:

* certainly introduced or

‡ probably introduced and

† possibly introduced.

All grid references relate to the Irish National Grid.

Records and Notes

Equisetum hyemale L.

Abundant along the river for about 300 metres between Kilgobbin and Lamb's Cross, Sandyford, O 190250.

E. sylvaticum L.

Frequent on the Three Rock Mountain, at Ballyedmonduff, O 190230, and at Barnacullis, O 180240, 1975.

†Papaver lecoquii Lamotte

A garden weed at Kilgobbin, O 195250, 1974; and by the roadside at Stepside, O 195225, 1975.

Fumaria capreolata L.

A garden weed at Kilgobbin; still abundant in the station noted by Colgan in 1895 (Colgan, 1904) on the gravel mound at the ruined church at Kilgobbin, O 195250, 1971-1979.

Arabidopsis thaliana (L.) Heynh.

Light, dry cultivated soil at Kilgobbin, O 195250, 1971-1979; grounds of Sandyford Church, O 190256, 1974; grounds of Marlfield Nurseries, Cornelscourt, O 240250, 1973; flowerbeds at the east end of Trinity College, O 165340, 1978 and as a garden weed at Sandymount, O 186328, 1978-1979. This plant, which has been generally regarded as rare in Co. Dublin (Colgan, 1904; Anon., 1961), is spreading.

*Thlaspi arvense L.

In the old walled garden of Rocklands House, near Leopardstown Hospital, O 196259, 1978-1979. Abundant among the vegetable crops with Hyoscyamus niger L.

†Coronopus squamatus (Forsk.) Ascherson

Abundant in trampled mud in a field by the road at Kilgobbin, O 195250, 1972-1979.

*Rapistrum rugosum (L.) All.

Not listed in Scannell and Synnott (1972). Roadside near Stepside, O 195250, 1972; sea-wall near the Children's Traffic School at Clontarf, O 200236, 1973; by Milltown Bridge, several plants, O 175300, 1975-1978; several plants with Brassica nigra (L.) Koch, by Pigeon House Road, Irishtown, O 185330, 1977. This Mediterranean plant, which is widely naturalised in southern England, is establishing itself in the Dublin area. It generally occurs where earthmoving has recently been carried out. It is readily distinguished from other yellow crucifers by its distinctive fruit, which is ovoid, strongly rugose and ribbed; and by the pale colour of the flowers, which so differ in shade as to make the plant noticeable even at a distance.

Euonymus europaeus L.

Occasional in hedges to the east of the ruined church at Kilgobbin, O 190245, 1970. Although common in Co. Wicklow, this species is rare in Co. Dublin.

Lotus uliginosus Schkuhr

By the stream in fields below Ballyedmonduff, O 190230, 1973. This species has not previously been recorded from the south-east of the county.

Spargularia rubra (L.) J. and C. Presl

Several plants on fine gravel at the top of the quarry road from Barnacullia to the Three Rock Mountain, O 180300, 1976. New to the Co. Dublin flora. Specimen in TCD.

Potentilla anglica Laucharding

Frequent around Ballyedmonduff, O 190223, 1974.

Potentilla palustris (L.) Scop.

Sparingly in damp heathy ground near Ballyedmonduff, O 190230, 1977. This species has not been previously recorded in the south-east of the county.

*Sorbus intermedia (Ehrh.) Pers.

Not listed in Scannell and Synnott (1972). One large tree by the ruined church at Kilgobbin, O 195250, 1979. One tree in woodland at Barnacullia, O 180240, 1978. Two saplings in woodland at Kilgobbin, O 195250, 1978 and by the roadside between Stepside and Kiltiernan, O 200240, 1977.

*Crataegus laevigata (Poiret) DC.

Not listed in Scannell and Synnott (1972). One tree in dense shade, under beech, in the wood known locally as Lawless's Wood, Kilgobbin, O 200240, 1972. Probably planted. Specimen in DBN.

*Epilobium brunnescens (Cockayne) Englehorn and Raven

Established in disused quarries above Barnacullia, O 180240, 1973.

Viburnum opulus L.

Very infrequent. Beside the river between Lamb's Cross, Sandyford and Kilgobbin, O 190250, 1971.

*Cichorium intybus L.

Roadside at the Golden Ball Public House, Kiltiernan, O 205225, 1971-1979.

Tragopogon pratensis L.

Occasional and persistent by the Kilgobbin Road, between Sandyford crossroads and Murphystown Road, O 190255, 1972-1979.

*Solanum nigrum (L.) Koch.

In tilled fields near Kilgobbin, in considerable abundance, O 190225, 1975; also abundant in tilled fields near Foxrock, O 220250, 1975.

*Hyoscyamus niger L.

Abundant in the old walled garden of Rocklands House, near Leopardstown Hospital, O 196259, 1978-1979; with Thlaspi arvense L.

Verbascum thapsus L.

Still frequent at the site noted by Colgan (1904), on the gravel mound at the ruined church at Kilgobbin, O 195250, 1976.

Among burned furze to the north of the Blackglen Road, Sandyford, O 175255, 1973.

Lathraea squamaria L.

In Lawless's Wood, Kilgobbin, on elm and hazel, O 200240, 1972-1979.

Not recorded in the south-east of the county since 1727 (C. Threlkeld, in Colgan, 1904).

*Lamium hybridum Vill.

Frequent in tilled fields near Kilgobbin, O 190250, 1972-1977.

Lamiastrum galeobdolon (L.) Ehrond and Pol.

In the shady corner of the field to the east of the ruined church at Kilgobbin, O 190245, 1976. Not previously recorded in the south-east of the county.

Salix repens L.

Sparingly, near the dolmen at Kiltiernan, O 195220, 1977, in peaty ground.

Platanthera chlorantha (Custer) Reichenb.

Abundant in a meadow by the right-of-way from Barnacullia to Kilgobbin, close to Barnacullia, O 185250, 1972-1974. Not recorded in the south-east of the county since 1900 when it was recorded by Colgan (1904).

Typha latifolia L.

In the highest quarry pool on the Three Rock Mountain, above Barnacullia at 300 m, O 180300, 1979. Probably a recent arrival at this site.

Carex muricata L.

By the Kilgobbin Road, close to Sandyford Crossroads, several large clumps bordering the road, O 190255, 1973-1979.

Poa nemoralis L.

In several places around Kilgobbin, O 195250, 1972-1979.

Festulolium loliaceum (Huds.) P.Fourn.

Dominant in damp, ungrazed grassland by the stream at Kilgobbin, with Glyceria x pedicellata Townsend, O 195250, 1974-1979.

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A CHECKLIST AND BIBLIOGRAPHY OF IRISH OESTRIDAE
AND GASTEROPHILIDAE (DIPTERA)

D.P. Sleeman

Flies of the families Oestridae and Gasterophilidae are important because their larvae cause myiasis in mammals. The adults, which are large stout flies, are very difficult to collect. The larvae, once mature, can easily be located in the mammalian host (Zumpt, 1965).

Apart from the notorious cattle warble-flies, Hypoderma bovis and H. lineatum (Thornberry, 1975) the remaining species of Oestridae and Gasterophilidae have received only occasional attention in Ireland (Anon., 1911; Anon., 1976; Hatch, McCaughey and O'Brien, 1976; Sleeman, 1979). Eight species from the two families have been recorded in Ireland, in comparison to 11 species in the British checklist (Kloet and Hincks, 1976). A single species recorded in Ireland, Hypoderma tarandi, is not listed by Kloet and Hincks.

The nomenclature and systematic order follow Kloet and Hincks (1976) where applicable. Common names which indicate the primary host have been added.

Species List

OESTRIDAE

Cephenomyia auribarbis (Meigen, 1824) = C. rufibarbis. Red deer nasal bot-fly.

Oestrus ovis Linnaeus, 1758. Sheep nasal bot-fly.

Hypoderma bovis (Linnaeus, 1758). Larger cattle warble-fly.

Hypoderma diana Brauer, 1858. Roe deer warble-fly.

Hypoderma lineatum (Villers, 1789). Lesser cattle warble-fly.

Hypoderma (Oedemagena) trandi (Linnaeus, 1758). Reindeer warble-fly.

H. trandi is probably extinct in Ireland and the status of O. ovis as an Irish species is doubtful.

GASTEROPHILIDAE

Gasterophilus intestinalis (Degeer, 1776) = G. equi. Armed horse bot-fly.

Gasterophilus nasalis (Linnaeus, 1758) = G. clarkii. Linnaeus' horse bot-fly.

Specimens of all the above species except O. ovis have been deposited in the entomological collection of the National Museum of Ireland (Dublin).

Acknowledgements

I would like to thank the following for help and encouragement while compiling this checklist: James Dear (British Museum, Natural History); Charles Hatch (Veterinary College, Dublin); Robert Nash (Ulster Museum, Belfast); Jim O'Connor (National Museum, Dublin) and Martin Speight (Forest and Wildlife Service, Bray).

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BRYOLOGICAL OBSERVATIONS AT GLENIFF, COUNTY SLIGO (H 28)

N. Kirby, N. Lockhart and D. Synnott

The north-facing cliffs of the Benbulbin range have been visited by many bryologists and their flora is now well known. Noteworthy bryophytes recorded are Encalypta rhabdocarpa* by Taylor in Mackay (1836) and Barbula maxima and Orthothecium rufescens by Moore (1873). The British Bryological Society visited Ireland for the first time in September 1928 and spent a day at Gleniff (G 72 46) where several rarities were found including Gymnostomum insigne, Encalypta alpina, Timmia norvegica and Mnium thomsoni. In 1962 A.C. Crundwell and E.F. Warburg (1963) found Seligeria oelandica at Gleniff and in 1963 A.R. Perry and R.D. Fitzgerald found Pohlia wahlenbergii var. glacialis also at Gleniff (Warburg, 1964).

The purpose of our visit to Gleniff on the 17th October 1979 was to relocate these rarities and to make observations on the distribution of selected species, principally Gymnostomum insigne and Barbula maxima. We worked the lower, wetter cliffs, which have the richest assemblage of mosses. Here Gymnostomum insigne is plentiful, often growing with Orthothecium rufescens. The former occurs also in Scotland, where it was first found, and is endemic to Britain and Ireland. Barbula maxima is rarer and at Gleniff we found it only on the western half of the lower cliffs. In Ireland it is confined to Sligo and Leitrim, and was believed to be an Irish endemic until 1977 when it was found in Northern Canada (Steere and Scotter, 1978).

Orthothecium rufescens is plentiful in recesses of the dripping cliffs and O. intricatum is also present but scarcer. Seligeria trifaria and S. oelandica were both found in quantity but very few fruits of the latter were seen, in contrast to a previous visit by one of us (D.S.) in August 1970 when the British Bryological Society held a meeting in Sligo. S. oelandica is found only on the Sligo-Leitrim cliffs and in Sweden. It is probably identical with S. lapponica which is recorded from south-east Sweden and northern Swedish Lapland (Crundwell and Warburg, 1963).

Pohlia wahlenbergii var. glacialis is a circumpolar variety which has its only Irish locality at Gleniff. We found two patches of it growing from a very wet over-hanging ledge. Other noteworthy bryophytes seen were Mnium marginatum, Campylopus schwarzii, Platydictya jungermannioides, Barbula

* Nomenclature for mosses is according to Smith (1978) and for hepatics according to Paton (1965, 1979).

ferruginascens, Seligeria recurvata and Plagiochila britannica. This last species was recently described by J.A. Paton (1979) who has kindly confirmed the identification. It occurs in several vice-counties in England, Wales and Scotland and was previously known only from Armagh and Limerick in Ireland. At Gleniff it was growing on the horizontal surface of a large limestone boulder, intermixed with Plagiochila porelloides (P. asplenioides (L.) Dum.). The taxonomy of these and allied species is discussed by Paton (1979) and a key to the species of Plagiochila in the British Isles is given.

Notable species which have been recorded from Gleniff and which we did not see include Timmia norvegica, Dicranella grevilleana and Pedinophyllum interruptum.

Part of the following day, the 18th October, was spent on the north-facing cliffs between Benbulbin and Benwisikin (G 72 48). Many of the Gleniff species were seen again, including Barbula maxima, which was more plentiful here. Some other species found here but not at Gleniff included Distichium capillaceum, Ambylodon dealbatus, Gyroweisia tenuis, Porella laevigata, Herberta adunca and Bazzania tricrenata.

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SOME CRUSTACEAN RECORDS FROM LOUGH INE, CO. CORK

J.M.C. Holmes

During the past few summers the author has been carrying out field work on Lough Ine, Co. Cork. This work has been done partly in conjunction with Dan Minchin, Manager of the Fisheries field centre. We are accumulating data on several aspects of the ecology of the lough and eventually we hope to write detailed accounts of these. In the meantime, it was felt that a list of the Crustacean species we found would be a useful contribution.

L. Ine (W 0928) is a sea lough in West Cork. It is about $1 \times \frac{1}{2}$ km in size and roughly rectangular in shape. In the middle is Castle Island. In the south-west corner is a muddy creek called the Goleen. L. Ine is joined to the sea by a narrow channel through which the sea passes with the changing tides, causing rapids. Although the rapids pass over a shallow sill the lough is surprisingly deep, over 45 metres.

L. Ine is suitable for field work for a number of reasons. It is fully saline and has an entirely marine fauna, except for one or two regions where small freshwater streams flow in. It is sheltered and sufficiently small to be worked conveniently. It contains a variety of habitats, notably the rapids, which is an area especially rich in the more unusual forms of marine life.

L. Ine has been relatively well worked, notably by Professor Renouf of University College, Cork, and more recently by Professor Kitching of the University of East Anglia. Their work gives a good indication of the species which might be expected to be found. Also there are papers giving information on the physical components of the lough; depth, bottom types, salinity, etc. An extensive list of references is not included here. There are about 70 papers on L. Ine and most are already listed in the report on L. Ine published by An Taisce (Kitching, 1975).

Species List

Order CLADOCERA

Evadne nordmanni Lovén: Taken in night plankton tow, August 1979.

Podon intermedius Lilljeborg: Occasionally in the plankton.

Order PODOCOPA

Erythrocypris mytiloides (Norman): Found amongst sublittoral weed on muddy bottoms.

Semicytherura nigrescens (Baird): A littoral species.

Sclerochilus contortus (Norman): Specimens found in L. Ine.

Order CALANOIDA

Calanus helgolandicus (Claus): Taken in plankton, August 1979.

Centropages typicus Krøyer: Taken in night plankton tow, July 1978.

Centropages hamatus (Lilljeborg): Taken in night plankton tow, August 1979.

Isias clavipes Boeck: Taken in night plankton tow, August 1979.

Temora longicornis (O.F. Müller): Dominant in the plankton, August 1979.

Acartia clausii Giesbrecht: Taken in night plankton tow, August 1979.

Order HARPACTICOIDA

Sacodiscus littoralis (Sars): Taken in night plankton tow, July 1978.

Alteutha interrupta (Goodsir): Abundant in the plankton.

Peltidium purpureum Philippi: Found on Tunicate, Asciidiella aspersa (O.F. Müller).

Thalestris longimana Claus: Taken in night plankton tow, July 1978.

Clytemnestra rostrata (Brady): Taken in plankton, July 1978.

Order CYCLOPOIDA

Oithona similis Claus: Abundant in the plankton.

Notodelphys allmani Thorell: Found in Tunicate, Asciidiella aspersa (O.F. Müller).

Notodelphys elegans Thorell: Found in Tunicate, Ciona intestinalis (L.)

Doropygella psyllus (Thorell): Found in Tunicate, Asciidiella aspersa (O.F. Müller).

Ascidicola rosea Thorell: Found in Tunicate, Asciidiella aspersa (O.F. Müller).

Order POECILOSTOMATOIDA

Modiolicola maxima (Thompson): Found in Pecten maximus (L.).

Order SIPHONOSTOMATOIDA

Caligus curtus O.F. Müller: One specimen taken free in the plankton.

Caligus elongatus Nordmann: Found on Flounder, Platichthys flesus (L.), and Pollack, Pollachius pollachius (L.).

Lepeophtheirus pectoralis (O.F. Müller): Found on Flounder, July 1979.

Order THORACICA

Verruca stroemia (O.F. Müller): Commonly found on rocks near the rapids.

Chthamalus montagui Southward: Found on the North Pier.

Chthamalus stellatus (Poli): Found on the North Pier.

Balanus balanoides (L.): Abundant in the littoral zone.

Balanus balanus (L.): Found on submerged plastic thermometers which were being used as part of some experimental work.

Balanus crenatus Bruguière: Found amongst epifauna on submerged ropes.

Elminius modestus Darwin: Found on the North Pier.

Order RHIZOCEPHALA

Sacculina carcini Thompson: Frequently found on the Shore Crab, Carcinus maenas (L.).

Order CUMACEA

Iphinoe trispinosa (Goodsir): 1 specimen found at the surface near the rapids, August 1979.

Nannastacus unguiculatus (Bate): Taken in plankton and amongst sublittoral weed.

Cumella pygmaea G.O. Sars: Taken in night plankton tow, July 1978.

Pseudocuma similis G.O. Sars: Taken in night plankton tow, August 1979.

Order ISOPODA

Gnathia maxillaris (Montagu): 1 adult male specimen was found amongst sublittoral weed. Also, in the plankton, were a number of unidentifiable praniza larvae which may belong to this species.

Limnoria lignorum (Rathke): In driftwood cast up on the North Pier.

- Dynamene bidentata (Adams): On weed in the littoral zone.
- Idotea baltica (Pallas): Found amongst weed attached to a buoy.
- Idotea emarginata (Fabricius): 1 specimen found swimming in shallow water.
- Idotea granulosa Rathke: Found amongst weed in the rapids area.
- Idotea pelagica Leach: On weed and swimming at the surface.
- Janira maculosa Leach: Amongst Laminaria holdfasts in the rapids.
- Janiropsis breviremis G.O. Sars: Amongst Laminaria holdfasts in the rapids.
- Jaera albifrons Leach: Abundant under stones in the littoral zone.
- Jaera nordmanni (Rathke): Found on shore where there is a freshwater influence.
- Munna kroyeri Goodsir: Found amongst Laminaria holdfasts in the rapids.
- Ligia oceanica (L.): Abundant in upper littoral zone.
- Porcellio scaber Latreille: 1 specimen found on upper shore, July 1977.
- Pleurocrypta longibranchiata (Bate & Westwood): a male and female found in the branchial chamber of a Squat-lobster, Galathea squamifera Leach.
- Hemioniscus balani (Bate): Abundant in the littoral zone, infecting the barnacle, Balanus balanoides (L.).

Order AMPHIPODA

- Perrierella audouiniana (Bate): Locally abundant in sponges.
- Orchomene nana (Krøyer): Found amongst weed on buoys, August 1979.
- Lysianassa ceratina (A.O. Walker): Found amongst sublittoral weed.
- Panoploea minuta (G.O. Sars): 1 specimen found, October 1975.
- Gitana sarsi Boeck: Found amongst weed in the rapids area.
- Leucothoe spinicarpa (Abildgaard): 1 specimen found, July 1978.
- Stenothoe monoculoides (Montagu): Abundant amongst weed in the rapids.
- Orchestia gammarellus (Pallas): Found in the upper littoral zone.
- Orchestia mediterranea Costa: Found in the upper littoral zone.
- Hyale nilssoni (Rathke): Found in the littoral zone.
- Gammarus duebeni Liljeborg: 1 specimen found on the shore, July 1977.
Abundant in rock pools in the splash zone on the exposed open shore at Carrigathorna.
- Gammarus zaddachi Sexton: Abundant on shore where there is a freshwater influence.
- Gammarus locusta (L.): On weed on the shore and attached to buoys.
- Chaetogammarus marinus (Leach): Common in the littoral zone.
- Chaetogammarus stoerensis (Reid): Found on shore where there is a freshwater influence.
- Elasmopus rapax Costa: Amongst Laminaria holdfasts in the rapids.

- Gammarella fucicola (Leach): Abundant on sponges.
- Melita palmata (Montagu): Abundant in rock pools.
- Melita obtusata (Montagu): Specimens found in L. Ine.
- Cheirocratus sundevallii (Rathke): Specimens found July 1978.
- Perioculodes longimanus (Bate & Westwood): Taken in night plankton tow.
- Apherusa bispinosa (Bate): Specimens found in L. Ine.
- Apherusa jurinei (Milne-Edwards): Found in the rapids area.
- Gammarellus angulosus (Rathke): 1 specimen found at the surface at night, July 1977.
- Atylus swammerdami (Milne-Edwards): 1 specimen taken in night plankton tow, August 1979.
- Dexamine spinosa (Montagu): Specimens found in L. Ine.
- Dexamine thea Boeck: Found in the rapids area.
- Ampithoe rubricata (Montagu): Found amongst weed in the littoral zone.
- Ampithoe ramondi Audouin: 1 specimen found amongst sublittoral weed.
- Ampithoe gammaroides (Bate): Found in the rapids area.
- Ampithoe neglecta Lincoln (= A. helleri Karaman): Amongst sublittoral weed.
- Sunamphitoe pelagica (Milne-Edwards): 1 specimen found, October 1975.
- Aora gracilis Bate: Abundant on sublittoral weed.
- Microdeutopus versiculatus (Bate): Found on sponges July 1978.
- Microdeutopus anomalus (Rathke): Abundant on sublittoral weed.
- Lembos websteri Bate: Found in the rapids area.
- Gammaropsis maculata (Johnston): Found in the rapids.
- Microprotopus maculatus Norman: Amongst shell gravel on muddy bottoms.
- Corophium bonnellii (Milne-Edwards): Abundant on Tunicates.
- Jassa falcata (Montagu): Abundant in the rapids area.
- Erichthonius brasiliensis (Dana): Found in weed above the rapids.
- Parajassa pelagica (Leach): Found in the rapids area.
- Microjassa cumbrensis (Stebbing & Robertson): Found in the rapids area.
- Podocerus variegatus Leach: Abundant amongst Laminaria holdfasts in the rapids.
- Parathemisto gracilipes (Norman): 1 small specimen taken in night plankton tow, July 1978.
- Phthisica marina Slabber: Abundant in the plankton and attached to weed in the rapids area.
- Caprella acanthifera Leach: Abundant in L. Ine attached to submerged weed.
- Caprella acutifrons Latreille: Abundant amongst Laminaria holdfasts in the rapids.

Order MYSIDACEA

- Siriella clausii G.O. Sars: Taken in night plankton tows.
Erythrope elegans (G.O. Sars): Taken in the plankton, October 1979.
Mysidopsis gibbosa G.O. Sars: Taken in night plankton tow, August 1979.
Praunus flexuosus (O.F. Müller): Abundant in L. Ine.

Order DECAPODA

- Palaemon elegans Rathke: Found in the littoral zone.
Palaemon serratus (Pennant): Abundant in L. Ine.
Palaemonetes varians (Leach): Abundant in L. Ine.
Athanas nitescens (Montagu): Amongst epifauna on submerged ropes.
Eualus occultus (Lebour): 1 specimen found amongst sublittoral weed.
Thorulus cranchii (Leach): Found amongst epifauna on submerged ropes.
Hippolyte varians Leach: Abundant in L. Ine.
Pandalina brevisrostris (Rathke): Amongst submerged weed.
Crangon crangon (L.): Common in L. Ine.
Pontophilus fasciatus (Risso): Larvae taken in night plankton tow, July 1978.
Nephrops norvegicus (L.): Adult specimens seen while diving.
Homarus gammarus (L.): Larvae and adults seen in L. Ine.
Palinurus elephas (Fabricius): Rare but occasionally taken by fishermen.
Jaxea nocturna (Chiereghin): Trachelifer larvae taken in night plankton tows.
Callinassa subterranea (Montagu): Larvae taken in plankton tows.
Upogebia sp.: Larvae taken in plankton tows, July 1978.
Galathea squamifera Leach: Abundant in rock crevices in shallow water.
Galathea strigosa (L.): Locally common in the lough.
Pisidia longicornis (L.): Larvae and adults abundant in L. Ine.
Porcellana platycheles (Pennant): Larvae and adults commonly found in L. Ine.
Pagurus bernhardus (L.): Present in shallow water.
Maia squinado (Herbst): Specimens seen occasionally while diving.
Hyas sp.: Specimen seen while diving, July 1977.
Macropodia rostrata (L.): Amongst submerged weed and on ropes.
Carcinus maenas (L.): Abundant in shallow water.
Macropipus arcuatus (Leach): Common in shell debris.
Macropipus corrugatus (Pennant): Locally common in shallow water.
Macropipus depurator (L.): Common throughout L. Ine.
Macropipus puber (L.): Common near the rapids.
Pirimela denticulata (Montagu): Found amongst epifauna attached to submerged ropes.

Cancer pagurus L.: Commonly found in L. Ine.

Pilumnus hirtellus (L.): Found in submerged experimental cages.

Xantho incisus (Leach): Present beneath stones in shallow water.

Xantho pilipes Milne-Edwards: Present beneath stones in shallow water.

Goneplax rhomboides (L.): Larva taken in night plankton tow, July 1978.

Pinnotheres pisum (L.): Found in Tunicate, Ascidella aspersa (O.F. Müller) and Mussel, Mytilus edulis L.

This list is by no means comprehensive. Certain groups of Crustacea such as the Harpacticoids have not been fully examined. Roe (1960) records 61 species and Sloane et al. (1961) record 38 species. In this list only a few easily identifiable species of Harpacticoid have been recorded.

Renouf (1931), Sloane et al. (1961), Kitching et al. (1976) and Goss-Custard et al. (1979) record various Crustaceans which have not been found by us, so it is understood that our list could be greatly extended.

A selection of the animals collected has been deposited in the National Museum of Ireland.

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SOME RECENT PLANT FINDS IN THE KENMARE-KILGARVAN AREA OF SOUTH KERRY (H1)

Tony O'Mahony

Within the Roughty river valley between Kenmare and Kilgarvan in South Kerry (H1), carboniferous limestone occurs as only a narrow strip running parallel with the Roughty river and bisected by the main road. North of the road, the limestone is partly covered with deciduous woodland which supports a pleasant, but apparently meagre flora, while to the south it is bounded by the north bank of the Roughty, and is evident as only a few small field outcrops here.

On 17th April 1976, 15th September 1977 and 25th April 1979, three day trips were made to this region with a fishing party, when the opportunity was taken to record the flora. The more interesting finds are noted below. It was found that most of the calcicolous and naturalized plants were confined to the hedgebanks of the main Kenmare-Kilgarvan road, though the wooded Roughty river valley yielded some other established aliens in addition to its own interesting calcifuge flora. All in all, the juxtaposition of calcareous and acid soils and the frequency of naturalized plants in this area, make for a diverse, unexpectedly interesting flora.

The area actually botanised extended from Kenmare town eastwards to the Roughty tributary, the Owenbeg V 9672, a distance of approximately 6.4 kms.

In the following lists, species are arranged in accordance with the nomenclature and order used in Scannell and Synnott (1972), save for Veronica sublobata M. Fisher and Erigeron mucronatus DC., which are not listed by those authors. New county or vice-county records are indicated respectively:- (NCR), (NVCR); while an asterisk denotes alien status and a dagger dubious status.

FLORA OF THE MAIN KENMARE-KILGARVAN ROAD

The most frequent species of interest found along the roadway proved to be Geranium lucidum and Saponaria officinalis (here in a single-flowered as opposed to the more usual double-flowered form). About Kenmare, Polypodium australe was very common on limestone hedgebanks and rocks, while it occasionally occurred as an epiphyte on trees, as in the golf-course. In the vicinity of Kilgarvan, Clematis vitalba (as observed from the car) was abundantly naturalized in roadside hedges, while Petasites fragrans was established in patches along the road; its drab, leafy carpets having

largely displaced the native flora here. This species was formerly cultivated as a source of winter pollen for bees. However, it was soon ousted from gardens because of its aggressive spreading habit, and quickly established itself along roadsides and in woodlands in many parts of Ireland, where it continues to spread at an alarming rate. A pernicious weed, Winter Heliotrope proves virtually impossible to eradicate once it gains a foothold; therefore its establishment along at least one of the feeder streams of the Roughty must be viewed with alarm, as it poses a grave future threat to the flora of the riverbanks.

The more localized species of interest are listed below.

*Reynoutria japonica Houtt. V 908711. By the Finnihy River near Kenmare bridge, with Allium triquetrum and other species. 25.4.1979.

Ranunculus ficaria L. subsp. bulbifer Lawalree (NCR) V 908711. By the Finnihy River with the last, and intermixed with R. ficaria subsp. ficaria. V 9170. Also in a copse adjacent to a guest house facing Kenmare golf-course: cohabiting with subsp. ficaria here also. Easily overlooked and possibly native in this area, though not seen in any really 'wild' station.

*Berberis vulgaris L. V 9572. A single bush seen on a bank by the roadside near the schoolhouse. 17th April 1976.

*Chelidonium majus L. V 9472. A single plant seen in bud on the upriver stonework of Cleady bridge, on the Cleady River. 17th April 1976.

Alliaria petiolata (Bieb.) Cavara & Grande V 962728. About twenty plants on a boreen hedgebank, at its junction with the main road. 17th April, 1976.

*Prunus cerasus L. V 9472. A few flowering shrubs seen in a hedge near Cleady Bridge. 17th April 1976. Hypanthiums much larger than in Prunus avium.

Viola reichenbachiana Jordan ex Boreau V 9170. Frequent on limestone in the golf course, and on roadside walls thereabouts. 25th April 1979.

Pimpinella major (L.) Hudson V 9371. A single clump seen near 'The Cross Roads' on 25th April 1979. Doubtless more frequent here.

*Mentha x piperita L. V 966729. A fine clonal stand established on roadside bank adjacent to bridge over Roughty tributary. 15th April 1977.

*Mentha spicata L. (NCR) V 9271. Established on grassy roadside verge near ruined church, with other garden outcasts such as Petasites fragrans, Aegopodium podagraria, Scilla hispanica (or hybrid) etc. 25th April 1979.

Calamintha ascendens Jord. V 962728. A few plants on a limestone bank beside the main road, opposite the Alliaria site. 17th April 1976.

Veronica hederifolia L. s.str. V 9170. Growing in the golf course with Lathraea squamaria, Viola reichenbachiana etc. 25th April 1979.

Veronica sublobata M. Fisher (NCR) V 9170. In golf course with Veronica hederifolia etc. Also on a roadside wall nearby. 25th April 1979.

Note:- These appear to be the first published records for segregates of the V. hederifolia group in Ireland, as Scannell and Synnott (1972) only recognized V. hederifolia in the aggregate sense. Despite the considerable phenotypic plasticity exhibited by both segregates (with a resultant overlap in virtually all macro- and micro-characters), I consider them good micro-species which, given practice, can usually be separated with confidence in the field - even where populations of both intermingle. Moreover, strong sterility barriers separate the microspecies, as is evidenced by the fact that, to date, no definite hybrids between them have been recorded for Europe. Field work in Mid and East Cork from 1977-1980, has shown V. sublobata to be much the rarest microspecies, in contrast to the situation in Wales and southern England. Furthermore, observations to date strongly suggest that V. sublobata is predominantly a woodland species in Cork, whereas V. hederifolia, in many of its stations, has more the aspect of an aggressively spreading colonist. A taxonomic account of the V. hederifolia aggregate in Ireland is currently in preparation.

*Veronica filiformis Sm. V 9271. Established garden outcast by roadsides on the eastern outskirts of Kenmare. V 9070. Also naturalized in a field by the Finnihy River behind the town. 25th April 1979.

Lathraea squamaria L. (NVCR) V 9170. About a Beech tree, just inside the golf course wall near the entrance. Associated with Viola riviniana, V. reichenbachiana, Veronica sublobata and V. hederifolia etc. 25th April 1979. Probably elsewhere on the limestone in this area, but overlooked.

*Erigeron mucronatus DC. (NCR) V 9170. A few plants on a wall near the golf course entrance. 25th April 1979. (Locally frequent about Cork city and neighbouring towns (H4/5), and reported as naturalized in other areas also).

+Allium scorodoprasum L. V 9271. Abundant in a small scrub wood (part of a farm-demesne) beside the main road, where its spiralled, hood-tipped, scabrid-margined leaves were intermixed with Anemone nemorosa, Veronica montana, Scilla non-scripta etc. - a thoroughly native assemblage. However, the peripheral shrubs included ornamentals such as Prunus lauro-cerasus, so that the true standing of the Sand Leek here (as elsewhere in Kerry and Cork) remains tantalizingly uncertain. 25th April 1979.

*Allium triquetrum L. V 908711. By the Finnihy River near Kenmare bridge with Reynoutria japonica etc. 25th April 1979.

FLORA OF THE ROUGHTY RIVER VALLEY

Among the chief components of the drier woodland flora were Anemone nemorosa, Veronica montana, Conopodium majus, Primula vulgaris, Sanicula europaea, Ranunculus ficaria subsp. ficaria, Luzula sylvatica and Euphorbia hyberna; while both banks of the Roughty yielded an abundance of Saxifraga hirsuta, S. spathularis and S. x polita. The more notable finds here were:

*Selaginella kraussiana (G. Kunze) A. Braun (NCR). Thoroughly established and forming beautiful yellow-green carpets on the sandy north bank of the Roughty, from a point where a tributary joins the river (V 965724) downriver to beyond the Ford (V 958723) - a distance of roughly 0.3 kms. 17th April 1976. Miss M. Scannell, Herbarium (DBN) National Botanic Gardens, informs me that Mr. Michael Long of Dingle added a second (H1) record on 21st April 1976, when he found this species growing plentifully on both grass margins of the avenue to Colaiste Ide, three miles from Dingle. Here the species grew with Lysimachia nemorum and Chrysosplenium oppositifolium, etc.

Polypodium vulgare L. V 9672. Frequent on hedgebanks of the boreen leading to a farm overlooking the Roughty Ford. Also as an epiphyte on Alder (Alnus glutinosa) along the river here. 25th April 1979.

*Reynoutria japonica Houtt. Thoroughly established (at present as small colonies) along at least the north bank of the Roughty. 1976-1979.

*Saponaria officinalis L. Single-flowered populations scattered along the river - especially on the gravel islands. 1976-1979.

†Aquilegia vulgaris L. V 9572. A few leaf rosettes of Columbine were seen on a partly wooded, south-facing limestone outcrop overlooking the Roughty on 17th April 1976. Unfortunately, the farm owner had already partly denuded the outcrop, where the species may well be native - in contrast to most or all of its other Kerry stations. Associated species included: Polypodium australe, Asplenium trichomanes subsp. quadrivalens, Centaurium erythraea, Prunus spinosa, Rosa micrantha and the normally calcifuge Veronica officinalis. Euonymus europaeus occurred as a single bush in an adjacent hedgerow.

Rosa tomentosa Sm. Frequent in the Roughty river valley. 1976-1979.

Rosa micrantha Borrer ex Sm. (NVCR). Frequent in the Roughty river valley. 1976-1977. This is the source for the census record in O'Mahony (1976, p.42) where, however, the station was inadvertently omitted. This rose should prove frequent in Kerry, while its occurrence in (H6), (H7) and (H8) is also likely.

*Heracleum mantegazzianum Sommier & Levier (NCR) V 9672. A few fleeting leaf rosettes seen on the sandy north bank of the Roughty on 15th September 1977. The dimorphic petiole hairs with red, bulbous bases, and the succulent, cabbage-textured, subglabrous leaves were distinctive. Not seen in April 1979.

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WILLIAM FREDERICK JOHNSON: NOTES ON HIS ENTOMOLOGICAL COLLECTION
AND MSS. HOUSED IN THE NATIONAL MUSEUM OF IRELAND

J.P. O'Connor

After the death of Rev. W.F. Johnson in March 1934, the National Museum of Ireland obtained a large collection of his insects from his widow. This material comprised some 11,500 specimens of mainly Odonata, Lepidoptera, Hymenoptera and Diptera. In addition, Mrs. Johnson presented the museum with two volumes of his entomological diary and several notebooks. The remainder of his library appears to have been dispersed (Riley, 1934).

Johnson had a long association with the National Museum. He first presented specimens to it in 1893 and continued to donate material at irregular intervals until 1919. As a result, the museum also possesses material belonging to groups other than those acquired in 1934 (e.g. Myriapoda, Arachnida, Coleoptera).

A study of Johnson's collection will demonstrate two fundamental necessities to any Irish entomologist, *viz.* (1) the necessity of checking old records by examining extant specimens in museums, particularly when engaged in revisionary work, and (2) the importance of depositing voucher specimens in museums where they can be verified by future generations. As Praeger (1949) remarks, it was fortunate that Johnson "preserved his specimens.... for his eye was scarcely sufficiently critical for the discrimination of some of the more difficult species which were included in his many papers and notes"; a statement which is undoubtedly true for several recently examined groups (e.g. Odonata, Trichoptera). Nevertheless misidentifications do not detract from Johnson's marvellous contribution to Irish entomology. Indeed, one of his obituaries correctly points out that when "it comes to be considered that Johnson worked practically alone, and far from any reference library or named collections, his work amongst the Irish insects will always stand out as a remarkable achievement" (Anon., 1934a).

Johnson's output of papers and notes on natural history was prodigious. Beirne (1979) lists over 200 of his publications on insects alone. His most important work dealt with the Coleoptera and resulted in two major articles (Johnson and Halbert, 1902, 1912). He took a leading part in the Clare Island Survey and, besides collecting all orders of insects for other recorders, contributed the section dealing with the Chilopoda and the Diplopoda (Johnson, 1912; Anon., 1934b). For further information concerning Johnson's life and work, the reader should consult Anon. (1934a, b), Riley (1934), Walker (1934) and Praeger (1949).

Museum material collected by Johnson

There are some forty storeboxes of insects housed in the museum. These contain mostly Odonata, Lepidoptera, Hymenoptera and Diptera from Ireland. However other insect groups and foreign species are also represented. In addition, there is Johnson material, belonging to nearly every order of insect and to the Arachnida and Myriapoda, incorporated into the general reserve collections.

Johnson Mss.

Manuscripts 1-5 seem to have been bound in black after they were received by the museum and the titles are probably not those of Johnson.

(1) "List of Irish Ichneumonidae and Hymenoptera" (26.5 x 21 cm, c.460 pp.). The first half of this manuscript consists of a diary commencing 20th February 1912 and ending 18th August 1933, several months before Johnson's death. In it, he mentions various species that he had collected, particularly in the Odonata, Lepidoptera, Coleoptera, Hymenoptera and Diptera. He also lists Diptera named for him by J.E. Collin and Ichneumonidae determined by A. Roman. In addition, there are observations and comments upon other aspects of Natural History. The second half is a list of Hymenoptera with published Irish records noted against the relevant species.

(2) This large manuscript (33 x 21 cm, c.190 pp.) is entitled "List of Irish Lepidoptera and Hemiptera" and "Notes on sawflies". It contains published and unpublished records of the above groups. A loose note placed in it by A.W. Stelfox states "N.B. In some cases the specific name to which the Ms. records in Johnson's catalogue refer are placed after the localities, as the names in a collection are placed after the insects and not before as is usual in lists". There are also notes transcribed from "Cameron's Phytophagous Hymenoptera vol. 1" including keys probably used by Johnson.

(3) "List of Irish Coleoptera 1" (33 x 22 cm, c.370 pp.). There is a list of beetle records in this work.

(4) "List of Irish Coleoptera 2" and "Notes on Myriapoda" (33 x 21.5 cm, c.200 pp.). As well as the beetle data, manuscript 4 contains information on other groups including the Hymenoptera Aculeata. There are both published and unpublished records. In addition, there are transcribed keys for the identification of Myriapoda.

(5) "Entomological diary and notes" (24.5 x 19.5 cm, c.330 pp.). This is a most useful work. It begins with miscellanea including a list of the Coleoptera of the Belfast Natural History and Philosophical Society. These are followed by (a) "dates and places of Coleoptera captures" commencing 24th May 1884 and ending 13th July 1892; (b) Irish Lepidoptera collected by W.F. Johnson (1886-1892). The diary then continues from 1892 to 1911 with notes on various species taken by Johnson. The contents of the manuscript are confused, entomological details often being interspersed with such curiosities as "Answers to Hewitt's Examination Questions on the Greek Language". As well as the diary sections, there are various notes on and lists of Irish animals (e.g. Hemiptera, Hymenoptera, birds).

(6) Blue and red notebook (20 x 16 cm, c.300 pp.) without a title. It contains transcribed notes and keys from various authors and deals mostly with the Myriapoda.

(7) Miscellanea such as drafts of papers, correspondence, several lists of Lepidoptera, Hymenoptera and Diptera. There are also photographs of Johnson and his wife.

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TWO ALIEN LEGUMES FROM WASTE GROUND IN DUBLIN

J.R. Akeroyd

In June 1979 I observed two alien, annual legumes, Cicer arietinum L. (Chickpea) and Lens culinaris Medicus (Lentil), growing on waste ground in Lower Gardiner Street, Dublin. On 8th July I collected herbarium material of each species, which has been lodged in the herbarium of Trinity College (TCD). Duplicate sheets were given to the Dublin Naturalists' Field Club, to be filed with their reference collection of plants growing wild in the Dublin inner city.

Neither of these two legumes has been previously reported growing in Ireland, although both are now widely sold here as dried pulses. The plants in Gardiner Street probably grew from seeds that had originated from the nearby 'whole foods' shop. Both C. arietinum and L. culinaris occur occasionally as casuals in Britain (Mason, 1974a,b).

Five plants of C. arietinum and eight of L. culinaris were growing together amongst rubble beside a ruined building, 100 m south of Mountjoy Square. The soil at this site, being largely derived from mortar, was warm and dry in June and July, which may have promoted the establishment of these two species, both of which are crops of warm-temperate regions. It is unlikely that either species will persist in our cool climate, although both were setting seed. The site has since been heavily disturbed.

C. arietinum and L. culinaris are widely cultivated in the Mediterranean, the Middle East, India, N. Africa and C. and S. America. C. arietinum is a major food crop ('gram') in India. Neither species is known as a truly wild plant, although several wild, annual species of Cicer occur in south-east Turkey, including C. reticulatum, the probable ancestor of C. arietinum (Ladizinsky, 1975).

C. arietinum and L. culinaris are illustrated in Nicholson *et al.* (1969). A detailed drawing of C. arietinum is given in the most recent monograph of the genus Cicer (Van der Maesen, 1972, p.33).

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INSTRUCTIONS TO CONTRIBUTORS

Papers and short notes dealing with the distribution of the Irish flora and fauna, as well as material of a more general nature, are invited from authors.

Would persons submitting manuscripts please adhere to the following list of instructions:

1. Typed copy essential with wide margins.
2. It helps if the copy is clean and not embellished with a mass of super-imposed corrections.
3. Double spacing is essential.
4. Acknowledgements: insert after the text and before the references.
5. References: where mentioned in the text, please refer to author's (or editor's) name, plus year of publication. e.g. O'Shagda (1976); the full reference then appearing at the end of the text as follows:
O'Shagda, M.D.(1976). Coprolites from Provencal soutteraines.
J.med.Arch., 7 (5), 21-376.

Details of periodicals presented in abbreviated form must be in conformity with the form used in the World List of Scientific Periodicals.

6. Species names: must be fully underlined. When a genus is mentioned for the first time, please give its generic name in full as in Kisme, after which it can be abbreviated to e.g. K.kate.
7. Records: because distribution records of animals and plants are likely to provide one of the main foci of the Bulletin it would be worthwhile ensuring that a certain minimum of information is incorporated into each record made, as follows:-
 - a) Scientific name of organism, plus describers name.

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8. Diagrams: please use black on white and avoid large solid areas of black. Shading should be by means of lines or dots, not half-tones. Please produce diagrams the size you wish them to appear in the Bulletin.
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