

**THE FLORA OF
COUNTY CAVAN**

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THE FLORA OF COUNTY CAVAN

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Paddy Reilly

Dublin

THE FLORA OF COUNTY CAVAN

INTRODUCTION

The many references and records from the literature used in this work are a testament to Cavan's place in the world of botany. Cavan is notable for two plants, a moss and a horsetail, that were named and described for the first time from specimens gathered in the county. In 1803 Dr Robert Scott, Professor of Botany at Trinity College Dublin, found a moss 'on the banks of a rivulet on the mountains near Swanlinbar in argillaceous soil', which when examined proved to be new to science. *Dicranum scottianum* was the name given to it by Dawson Turner in his honour. Scott published this name in an illustrated paper in 'Transactions of the Dublin Society (1803) and received a premium award from the Society 'granted for the discovery of native plants of Ireland not hitherto described by any Botanic writers' (Scott, 1803; Nelson, 1997)*. In 1984 Dr Alan Willmot, a visiting British botanist, found an unusual horsetail 'on a roadside bank of tall herbs and bushes near Black River north of Dowra'. It proved to be a new hybrid between *Equisetum fluviatile* L. and *Equisetum telmateia* Ehrh. A description of the plant was published by Dr C.N. Page of the Royal Botanic Garden, Edinburgh and it was named *Equisetum ×willmotii* (Page, 1995). While Professor Scott's moss has been found in many other places, Willmot's horsetail is unique to County Cavan. It has not been found anywhere else. Isolectotypes are in the Herbarium of the National Botanic Gardens, Glasnevin, Dublin.

METHOD AND SOURCES

In this account I have aggregated all references to and records of the Cavan flora, known to me, and added my own observations and records to those of present and former workers. Contributors are named and brief biographies given. The sources of records, annotations and herbarium specimens from 1726 to the present are in the appendices and the species list. The earliest records were extracted from floras published between 1726 to 1898 and from papers published in journals including the *Transactions* and *Proceedings of the Royal Irish Academy*. For the later period, publications in *Irish Naturalist* (1892-1925), *Irish Naturalist's Journal* (1925 to 1999), *Proceedings of the Royal Irish Academy* and *Watsonia* (Journal of the Botanical Society of the British Isles) were perused. The National Herbarium at Glasnevin, Dublin and the Herbarium at Trinity College, Dublin were also searched. Contemporary contributors are usually members of the BSBI (Botanical Society of the British Isles) whose objective is the study of the flora of Great Britain and Ireland as a unit in terms of frequency and distribution of species.

* This flora does not include mosses.

To study and comment on the development of the flora, some knowledge of the county's geology, history and population changes is useful. In addition to explaining the presence or absence of plants, such information gives added interest to botanical explorations. To walk the hills and fields and not be aware of their underlying geology, nor to observe and wonder at the many impressive monuments left by early inhabitants, would be an enriching opportunity lost. For these reasons references will be found in the text to the geology of the county, its history, population statistics, ancient forests, and the weather.

A county flora is dynamic, evolving with land-use and management changes. This work is therefore not complete - no flora is. Its only claim is to present the results of fifteen years searching and researching by myself and my botanical friends. I hope it will be regarded as a stage in a journey of endeavour; to find new county records and rediscover old ones. I also hope, with confidence, that others will experience a personal pleasure walking around this beautiful county and meeting its hospitable and friendly people.

THE PHYSICAL LANDSCAPE

Cavan is an inland county in the north-central portion of Ireland. Its area is 193,214 hectares or 746 square miles (RLP, 1901). Six other counties adjoin it: on the north and north-west are Fermanagh and Monaghan, on the west is Leitrim and on the south are Longford, Meath and Westmeath. It is 93 kilometres (58 miles) on its east-west axis (between Cabra Castle east of Kingscourt and the Leitrim border west of Lough Naweelion) and 45 kilometres (28 miles) on its north-south line (between Bloody Pass north of Belturbet and Lough Kinale to the west of Finnea).

Although an inland county, just 26 kilometres (16 miles) separate Cabra Castle from the Irish Sea at Castlebellingham, County Louth. To the west, less than 29 kilometres (18 miles) lie between Tullynamoyle, north of Dowra, and the Atlantic Ocean at Cummeen strand in Co. Sligo.

Only 0.02% of the surface is over 608 metres (2000 ft) above sea level and 80% is less than 152 metres (500 ft). The following table gives a more detailed breakdown (after Praeger, 1901):

TABLE OF ELEVATION, COUNTY CAVAN

0 – 250 feet [076m]	33.8%
250 – 500 feet [152m]	45.8%
500 – 1000 feet [304m]	16.5%
1000 – 2000 feet [608m]	4.0%
over 2000 feet	0.02%

In mid-county, the isolated sections of high ground are readily visible against a background of agricultural land. The section west of Ballyconnell is topographically and geologically distinct; most of the ground over 304 m (1000 ft) is in this area.

Modern methods of land classification estimate that 77% of the land in Cavan is 'marginal': that is to say, 'land whose use for agricultural purposes is curtailed by natural limitations, such as soil type, topography or climate'.

This definition includes the following land types:

- (1) Mountain and hill; land above 1,220 feet. Limitations due to altitude, rock outcrops, shallow depth of soil, slopes, wetness and inaccessibility.
- (2) Wet mineral lowlands; inter-drumlin land, blanket or basin peat.

The following table gives the extent of 'marginal land' in Cavan and other Irish counties (Gardiner & Radford, 1980):

EXTENT OF MARGINAL LAND BY COUNTY

County	%	Acres	Hectares
Leitrim	97	538,614	145,129
Kerry	80	930,215	376,453
Donegal	79	929,548	376,183
Cavan	77	349,774	141,552
Mayo	73	955,392	386,642
Clare	70	544,143	220,212
Roscommon	58	348,074	140,864
Galway	54	775,846	313,081
Sligo	54	238,026	96,328
Limerick	52	345,493	139,819
Laois	52	220,110	89,887
Wicklow	47	234,112	94,744
Monaghan	44	139,039	56,268
Longford	41	104,220	42,117
Cork	37	675,229	273,262
Tipperary	37	389,932	157,803
Offaly	35	173,557	70,237
Kildare	32	131,539	52,233
Carlow	22	47,921	19,313
Westmeath	21	91,413	36,944
Kilkenny	20	102,593	41,519
Wexford	19	99,299	40,186
Louth	17	35,107	14,208
Meath	12	71,028	28,745
Dublin *	11	25,006	10,102
Waterford	8	33,899	13,719

*Approximately 20% of Dublin is urban land.

Drumlins

Drumlins are the most striking topographical feature of the Cavan landscape and the reason for its soubriquet 'the county of the little hills'. The Cavan drumlins are part of a crescent shaped belt extending from Strangford Lough westward via Cavan to south Donegal. Glaciers transporting large uneven quantities of boulder clay formed them. When the ice began to melt masses of clay were deposited and the forward movement of the melting glacier moulded the clay into the oval shapes, which are now drumlin hills. The long axis of the drumlins is in the general direction of the local ice-flow. Cavan drumlins have cores of chert, limestone or shale. The drift covering may be from 2 to 40 feet. Slopes of 20 to 30 degrees have been recorded at Ballyhaise, which is near the centre of the belt (Ryan and Lee, 1965). The majority of Cavan's drumlins have been integrated into the agricultural landscape so botanical interest is confined to an extensive network of hedgerows and the inter-drumlin areas.

Examples of drowned or partially submerged drumlins may be seen in the Lough Oughter section of the Erne basin and at Lough Gowna.

GEOLOGY

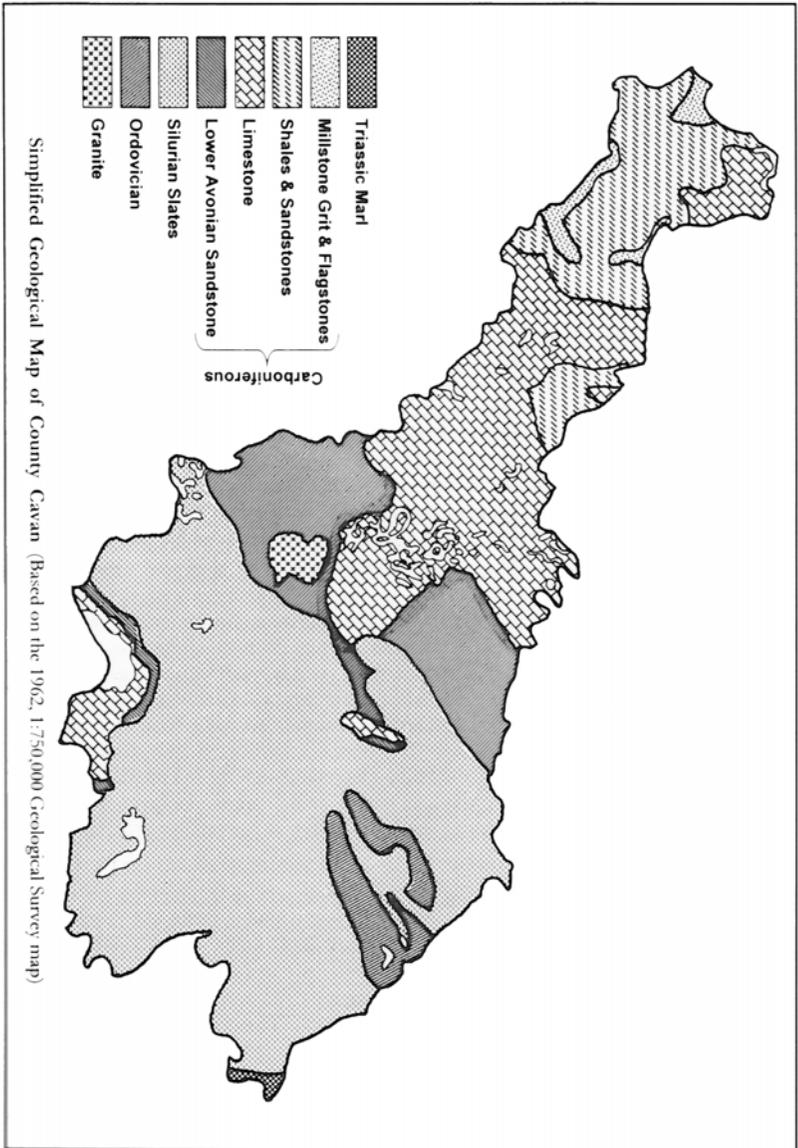
The geological diversity of the county is well documented in the detailed maps produced by the Geological Survey and in the Journals of the Royal Geological Society of Ireland. Maps to the scale of 1 inch to the statute mile are available. Each map is accompanied by an explanatory memoir. The districts covered are:

- Sheet 56: Dowra, Blacklion and Swanlinbar .
- Sheet 68: Cavan, Belturbet, Killashandra, part of Ballyconnell, Redhills, Ballyhaise, Butlersbridge and Crossdoney.
- Sheet 69: Cootehill, Shercock, Stradone and Tullyvin.
- Sheet 79: Bellananagh, Kilnaleck, Mount Nugent, Crosskeys and Scrabby.
- Sheet 80: Ballyjamesduff, Bailieborough, Kingscourt and Mullagh.

For general purposes, the Geological map of Ireland (3rd Edition 1962) 1:750,000, based on the work of the Geological Survey, is excellent and adequate. Cavan has three well-defined geological sections:

Ordovician

The part of the county north of Ballyhaise lies on a wide band of the Ordovician. It stretches south-west to Cavan town where it is interrupted by a 'bight' of the Lough Oughter limestone and continues in a south-westerly direction to Bellananagh, Killashandra, Arvagh and the northern part of Lough Gowna. Shercock and an area to the north are on large outliers of the Ordovician. There are smaller outcrops at Ballyjamesduff and south of Cavan town. The highest ground is at Bruse Hill 285 m (935 ft), 5 km north-east of Arvagh.



Silurian

The part of the county south-east of a line between Ballyhaise, Cootehill, Cavan town and Bellanagh, is formed, principally, of Silurian slate. The towns of Kingscourt, Mullagh, Kilnaleck, Cootehill, Virginia and Bailieborough, are all on this formation, as is Lough Ramor, Skeagh Lough and the southern part of Lough Gowna. The bed-rock is very near the surface, often visible as rocky knolls or in quarries, some still working. The land is undulating and mostly covered with drift. The highest ground is at Slieve Glah 322 m (1,056 ft), 6 km south-east of Cavan town; Shantamon 218 m (715 ft), 6 km north-east of Cavan town and Cornasuas 314 m (1,030 ft) near Bailieborough. With the exception of Shantamon, which is covered by a coniferous forest, all areas of high ground are good botanical sites.

On the eastern edge of the Cavan Silurian, gypsum deposits are mined at Kingscourt. The beds are of good quality and very thick. They are exploited both in surface and underground workings for plaster of Paris (Charlesworth, 1953). Some of the deposits are reddish in colour due to admixture with small quantities of red clay (Nevill, 1969).

Carboniferous

The great central limestone plain extends into Cavan from Meath at Lough Sheelin. It arcs around the northern shore of the lake, from Finnea to a point north of Mount Nugent. The limestone is separated from the Silurian rocks on the northern side of the lake by a band of sandstone, which also follows the contours of the lake. This sandstone band stretches from Granard in County Westmeath to Mount Nugent. There is a large outcrop of reef limestone at Carrickmore, north of Finnea. Limestone forms the basin of the River Erne from Crossdoney, northwards to Lough Oughter. Over time, the river has eroded and dissolved the limestone rock to form the inter-connecting lakes. The bedrock is covered by a thick layer of glacial drift and is seldom visible (Whittow, 1974). The limestone extends from Killashandra to the area north of Belturbet. Isolated pockets are found throughout the county; the best known is the outlier at Stradone, south east of Cavan town.

The area west of Ballyconnell has a more diverse geology. The high ground is mainly limestone country, but coal measures, millstone grit and flagstone series are also found there (*Geological Survey Map*, 1962). This north-west section includes Slieve Rushen 412 m (1,351 ft), Cuilcagh mountain 665 m (2,182 ft) - the highest ground in the county - the towns of Swanlinbar, Blacklion, Dowra and the Glangevlin valley. The high ground above Blacklion and the uplands at Corratirrim consist of fossil-rich Carboniferous limestone with extensive exposures of limestone pavement, principally of the shattered type. The lower sections are covered by drift and blanket bog. The inviting but difficult to access cliffs of Moneenterriff (millstone grit and sandstone series), overlook the southern part of Glangevlin. Part of

the Connaught coalfield is in this area. Menesk Colliery is marked on Griffith's map of the coalfield (1818), at 356 m (1,168 ft) on Lugnaquilla Mountain 452 m (1,483 ft), across the valley from the Shannon Pot. Slieve Anierin (The Iron Mountain), is situated on the Cavan and Leitrim border. Iron, in the form of nodules or clay iron-stone, is still found near Swanlinbar - in Irish 'An Muilleann Iarainn' (The Iron Mill). The need to fuel the sixteenth-seventeenth century smelting works there led to the destruction of the natural forests in this area.

Granite. Intrusions of this igneous rock occur at Crossdoney, south-west of Cavan town and at Bellananagh (Anon. *J. Roy. Geol. Soc. Ireland* 1885-89).

CLIMATE

There is no synoptic meteorological station in Cavan, but data collected at Clones, County Monaghan, 10 km (6 miles) north of Redhills, is relevant. In addition, rainfall measurements at stations within Co. Cavan are referred to.

The annual average rainfall at Clones over the thirty-year period 1951 – 1980 was 917 mm. This figure may be compared with data for the same period from the two stations where the national maximum and minimum amounts were measured: Delphi Lodge (County Mayo) with a mean of 2,542 mm and Dublin Airport with a mean of 750 mm.

The highest rainfall measured within Co. Cavan occurred at the Cuilcagh Mountain station (H 130241), with an average of 1,800.7 mm over the period 1975 – 1987. The town with the highest rainfall is Swanlinbar, on a shoulder of Cuilcagh, where 1,734.6 mm was recorded in 1982. In the same year 2,102.1 mm was measured on Cuilcagh Mountain and 925.8 mm at Ballyhaise.

During the period 1960 – 1984, the mean number of days with 5 mm of rain or more was 66 at Clones and 120 on Cuilcagh.

Air temperatures measured at Clones over the 30-year period 1951 – 1980 based on monthly and annual values gave a mean daily maximum of 12.4°C, a mean daily minimum of 5.3°C and a mean daily air temperature of 8.9°C.

The warmest month during the period was July, when the mean temperatures ranged from 10.5°C to 18.2°C, with a mean of 14.4°C. The coldest month over the period was January, when the mean temperatures ranged from 0.8°C to 6.5°C with a mean of 3.7°C (Rohan, 1975).

LANDSCAPE HISTORY

There is contemporary and historical evidence for the existence of ancient forests in Co. Cavan. Their presence and extent may be gauged from the following observations.

Of the eight plants mentioned by Praeger (1934) as being indicative of old woodlands, four are recorded in Cavan, namely: *Festuca sylvatica*, *Lathraea squamaria*, *Monotropa hypopitys* and *Neottia nidus-avis*. The absent species are *Cephalanthera longifolia*, *Milium effusum*, *Pyrola media* and *P. minor*.

In his Statistical Survey of the county, written in 1802, Sir Charles Coote observed:

‘The woods of Cavan were formerly very considerable and the timber of uncommon size, which argues that the soil is favourable to plantation. Immense trees are found in bogs, much greater than I have seen elsewhere.’

The remains of a sunken forest similar to that described by Coote, may be seen at Corratinner Lake, near Kilinkere, east of Virginia. Large tree stumps were exposed when the water level was lowered by drainage operations in a nearby bog (Plate 14).

Prior to the Plantation in 1612, large areas of natural woodland still existed in the river valleys, on lakeshores and on the borders of the county:

‘In the extreme west the Shannon valley was wooded where the river enters Lough Allen and so also was the southern shore of upper Lough Macnean and the valley of the Swanlinbar. From the border north of Belturbet, woods stretched at least to Bellananagh. The northern and eastern shores of Lough Sheelan and round Kingscourt carried timber. South of Cootehill were woods of oak, birch and alder. Of the broad-leaved trees, oak was by far the most widespread. Ash was less common except where limestone was sufficiently near the surface to give a calcareous soil. Alder was abundant where the water table was high and hazel was frequently associated with oak. The only other common species were birch, holly, yew and juniper, none of which were extremely common, alone represented the evergreens?’ (McCracken, 1971)

THE EIGHTEENTH AND NINETEENTH CENTURIES

Three events in the history of the county despoiled the landscape and destroyed much of the natural vegetation – 17th and 18th Century ironworkings, population increase coupled with intensive monoculture, and finally famine and emigration in 1845-’47. It should be noted that these events only affected plants of natural woods and leased arable land. They did not impinge on the vegetation in aquatic and semi-aquatic habitats, nor on mountain and other marginal land, and the extensive woods and gardens within demesnes.

IRONWORKS

In the seventeenth and eighteenth centuries, the presence of iron ore near the forests at Arvagh and Swanlinbar, led to the construction of ironworks in these remote inland areas. The destruction of the Cavan forests in the north-west can be attributed to the immense quantities of timber used to fuel the iron-works. 'The cord, that is a loose bundle of branches about 12 ft long and about 4 ft in diameter, was a measure of timber for the works. About twenty of these bundles were needed to make a ton of bar iron from ore, or, to put it another way, it took about 2 ¼ tons of charcoal to make one ton of bar iron' (McCracken, 1971). The principal ironworks was at Swanlinbar in West Cavan.

'The town is supposed to have derived its origin from a rich iron mine in the neighbouring mountain of Cullcagh, which was worked at a remote period to a very considerable extent. These works continued until all the timber on the mountains was consumed in smelting the ore, when they were necessarily abandoned' (Lewis 1846). Another observer wrote *'the surrounding scenery is only destitute of timber to complete the landscape: the woods have been long since cut down to supply the furnaces at Swanlinbar ... Demesne grounds now can only boast of this valuable ornament which will be particularly noticed in their places'* (Coote, 1802).

POPULATION INCREASE (1750-1850)

The destruction of the lowland vegetation outside the demesnes took place in the eighteenth century. The causes were a population explosion and the concomitant intensive farming on small pockets of land. A system of subdividing farms amongst the farmer's sons on marriage was common practise. With each division the farms became smaller, cultivation more intense and the fertility of the soil was progressively reduced. In the first half of the nineteenth century the size of many holdings in Cavan averaged between 6 and 8 acres (O'Mordha, 1963).

The search for fuel was another important factor. In 1809, the Parish Surveyor at Drung wrote 'The very great scarcity of fuel which has long prevailed in the parish, has led to the extermination of every remnant of natural wood upon its surface'.

An important side-effect of intensive tillage and the search for fuel was the elimination of wildlife habitats. The destruction of woods, thickets and hedges left no living space or food for hedgehogs, foxes, badgers and many birds and insects. It also reduced in number plant species that require partial shade to survive.

FAMINE AND EMIGRATION

During the famine years of 1845-'47, many small farms were abandoned or the tenants were dispossessed. Much of the arable land was converted to grazing. The population decreased dramatically and has continued to fall. It reached its lowest point at the last census in 1991; 52,756 persons, a population density of 71 persons per square mile. This figure is about 22% of the 1841 population of 243,158 when the density was 314 persons per square mile.

RE-AFFORESTATION

In order to replace some of the tree cover lost by the destruction of the aboriginal forests before and during the famine years, some landowners and later the Government turned to forestry. A record survives of commercial tree cultivation and planting during the period 1820-1845, in the area around Lough Ramor at Virginia. During the first half of the eighteenth century, the land around the lake was part of the estate of the Earl of Bective. The Earl was a keen tree planter and employed a gardener in two estate nurseries in the town of Virginia. He planted trees on some of the islands on Lough Ramor and on the mainland for landscaping purposes. The remainder were sold to other landowners in the county. The tree and shrub species planted in the Bective estate and sold from the nurseries were: alder, ash, balsam poplar, beech, box, Canadian poplar, horse chestnut, Spanish chestnut, common laurel, elm, hazel, holly, laburnum, larch, oak, poplar, Portugal laurels, spruce, sycamore, Tartarian honeysuckle, thorn, willows and yews (Reilly, 1997).

In 1901, it was estimated that woods covered only 1.1% of the county (Praeger 1901). State planting began in 1903.

'Land was acquired at Bailieborough Castle Demesne in 1911. The old woods contained oak, silver fir, beech, larch and Scots pine. These were cleared and Norway and Sitka spruce, Douglas fir, Scots pine, European larch and western red cedar were planted. The Scots pine and European larch were found to be unsuitable and were replaced with Norway spruce.

At Lough Ramor, Virginia, some of the original oaks were retained and oak groups planted through a matrix of Norway spruce, Scots pine and European larch. The Cootehill State Forest commenced with the Bellamont property about 1935 and was extended later by Dartrey estate, on the other side of the Town Lough, which they adjoin. Both were noted for the high quality of their oak, 50 foot branch-free stems were not uncommon and long lengths for special purposes were exported to England at one time. Most of the ground has been turned over to conifers, Norway spruce predominating with lesser amounts of Sitka spruce and Scots pine.

Forests have also been planted by the lake near Killashandra and Belturbet and in other locations along the shore of Lough Oughter and at Castle Saunderson. In the western part of the county, forests have been planted on Cuilcagh and at Swanlinbar? (Fitzpatrick, 1965)

By 1988, the state had acquired 4,537 hectares of land in Cavan for tree planting; roads, lakes and bogs take up 569 hectares of these. The total area planted was 3,968 hectares (Forestry Service pers. comm.).

These forests are open to the public as developed forest walks and parks. Dún an Rí, near Kingscourt, 558 acres, or 226 hectares, in extent, and Killykeen, north of Cavan town, 600 acres, or 243 hectares, are prime examples (Plate 16). Lough Ramor woods, the forests in the north-west at Glangevlin, Bellamont demesne at Cootehill, Castle Saunderson demesne north of Redhills and Bailieborough Castle demesne are also accessible.

Present-day County Council policy is to conserve and develop land and water resources for leisure activities and tourism. Holidays, fishing, golf, boating on the lakes and on the Woodford-Erne canal, horse riding and walking, all environmentally friendly pursuits, are promoted successfully.

CONTEMPORARY LAND USE

In 1901, Cavan was described as 'a fertile county, 56% being under grass and 28% under crops' (Praeger 1901). Most of the land then under crops is now used for grazing and the bulk of the food-crop requirement is imported from outside the county. In 1995, it was estimated that 420 hectares (1037 acres) were under crops. This is 0.2 % of the land. Only two crops were planted; potatoes 100 hectares (247 acres) and spring barley 320 ha (790 acres) (Teagasc 1995 pers. comm.). Intensive farming produces fowl, eggs and bacon.

During the past ten years road widening, straightening and the by-passing of towns, has resulted in a substantial amount of land disappearing under concrete. However, as a by-product, these works have provided new habitats in roadside cuttings, wider roadside margins and abandoned sections of the old roads, which, when the land is allowed to lie fallow and hedges are not cut provide a valuable reservoir for the local flora (Plates 11 & 12).

As part of a National Heritage Inventory undertaken by An Foras Forbartha, twenty-five Areas of Scientific Interest (ASIs) have been identified in Co. Cavan (Cabot, 1981). An area of scientific interest is defined as 'a site with natural or semi-natural features of ecology, geology, or landform. It may be valuable for supporting communities or populations of characteristic or endangered plants and animals, useful in describing the processes or factors that govern their appearance or important in interpreting the structure of land and its origins'. Twenty of the twenty-five ASIs in Co. Cavan are of botanical and ecological importance (See Appendix 4).

BOTANICAL EXPLORATION

The recording of wild flowering plants and ferns in County Cavan and the publication of records, can be divided into three periods:

1. The first records: 1726 - 1901.
2. The Praeger era: 1901 - 1950.
3. Contemporary records.

FIRST RECORDS; 1726 – 1901

Caleb Threlkeld (1676-1728)

Threlkeld was a dissenting clergyman who came to Dublin from Cumberland in 1713. He was the author of *Synopsis Stirpium Hibernicarum* (1726), regarded as the first Irish flora or plant list, with the locations of the plants he described. It contains the first published record of a wild plant found in Cavan, viz. *Eriophorum* sp. There is no evidence that Threlkeld visited Cavan, but he corresponded with other botanists and read their observations in the botanical books of the time.

John Rutty (1679-1775)

Fourteen years later, John Rutty, a physician and amateur naturalist from Wiltshire came to live in Dublin. He was the first botanist known to visit Co. Cavan. He travelled widely in the county, visiting Farnham, Belturbet, Swanlinbar and ‘the mountainous country near Bealyborough’. Seven annotations on his copy of Threlkeld’s *Synopsis* ..., (Library RIA), refer to Cavan plants; four with locations and two with the year of finding - 1739. They include *Taxus baccata* and *Solidago virgaurea*.

Rutty was the author of *An Essay towards a Natural History of the County of Dublin* (1772). In the chapter ‘Poisonous vegetables’, he published the first Cavan record of *Sium latifolium*.

The systematic recording of Cavan’s wild plants began and developed in the nineteenth century. The following field botanists searched diverse habitats in the county between 1802 and 1893. Their combined records give an overall picture of the known Cavan flora at the end of that century.

Dr Robert Scott (c.1757-1808)

Robert Scott was born and reared in Enniskillen, County Fermanagh. He studied medicine, chemistry and botany at Edinburgh and after working for several years as a physician, was elected Professor of Botany at Trinity College, Dublin, in 1800.

Scott often visited his home at Scottsborough in Co. Fermanagh and the mineral water spa at Swanlinbar in County Cavan. During these excursions (c.1802) he explored the countryside and found a number of hitherto

unrecorded plants on Cuilcagh Mountain. They comprise two ferns and eight flowering plants including three sedges. With the single exception of the moss *Dicranum scottianum*, he did not publish his botanical records but collected specimens for his herbarium. Some records he passed on to other botanists, principally John Templeton of Belfast, who credited them to Scott in his unpublished manuscript catalogue. Most were published by John Townsend Mackay in his *Systematic Catalogue of the rare plants found in Ireland* (1806), in a revised version published in 1807-8 (Nelson, 1997) and in *Flora Hibernica* (1836) *Saxifraga hypnoides*, *S. stellaris*, *Rubus saxatilis*, *Geranium lucidum*, and *Hymenophyllum tunbrigense* are amongst his first Co. Cavan records.

Thomas Walford (1752-1833)

The year 1818 saw the publication of *The Scientific Tourist through Ireland, by an Irish Gentleman, aided by the Communications of several friends*. The author is known to be Thomas Walford, described as ‘a militia officer and antiquarian’ (Colgan, 1906; Scannell, 1985). His book contains two new Cavan records - *Spergula arvensis* and *Myrica gale*. As Walford did not visit Ireland the records were probably communicated to him by his ‘several friends’ mentioned in the title.

James Townsend Mackay (1775?-1862)

James T. Mackay of Kirkcaldy, Scotland, came to Trinity College, Dublin as assistant to Dr Scott, the Professor of Botany and was subsequently appointed curator of the Botanical Gardens attached to the University. He was an enthusiastic field botanist and the author of a number of important botanical works including *A Systematic Catalogue of the rare plants found in Ireland* (1806-7). Up to this time botanists only recorded plants considered to be rare or of medicinal value; a practise that probably resulted in the loss of many records and locations of then common plants that in later years became scarce. In the preface to his *A systematic Catalogue of the rare plants ...* (1806) Mackay set out his own recording policy for this work:

‘Some difficulty occurred in selecting from the multitude of plants I noticed, such as appeared to me the most proper for this publication. Many were rejected on a revision of my list, as being too common, and as tending to make the work voluminous. The latter consideration made me expunge the observations of some plants and to abridge those of others...’.

Mackay’s *Catalogue(s)* (1806–1807) contain eight Cavan records, seven attributed to Dr Robert Scott and one found by himself – *Stratiotes aloides* ‘in drains by the side of the road near Castle Saunderson, Cavan’ (Mackay, 1806).

In an amended *Catalogue of the rare plants...* published in 1807, Mackay added three additional plants found by Dr Scott near Swanlinbar: *Saxifraga*

hypnoides, *Carex pendula* and *Dryopteris carthusiana* (as *Aspidium spinulosum*) (Nelson, 1997).

Mackay was the principal author of *Flora Hibernica* (1836), a more comprehensive work, which included all wild species known at the time. This book contains three new Cavan records by Mackay, sixteen additional ones by other contributors, some already attributed to Scott and Ruddy, and one by Mrs E. Tenant – *Valeriana* ‘In Farnham Demesne’ [ca. 1830] – this record is mentioned only in Mackay’s *Flora Hibernica* (1836).

Rev Nicholas J. Halpin (1790-1850)

By the year 1818, a total of twenty-five wild plants had been recorded in Co. Cavan. The next series, a major contribution, was again in the form of annotations on a working flora. At this time [ca. 1825], James T. Mackay was collecting records for *Flora Hibernica* (1836). It is likely that he sent copies of his *Catalogue of the indigenous plants found in Ireland* (1825) to active amateur botanists throughout Ireland, seeking their help by annotating the copies with new records and returning them to him to incorporate the results in his new flora. One of the recipients was Rev Nicholas J. Halpin, of Oldcastle, Co Meath (Reilly, 1995). Fortunately his annotated copy, the only one known to exist, was found in the library of the National Botanic Gardens, Dublin (Nelson pers. comm.). It contains one hundred and ninety one records from thirteen Irish counties, including fifty-eight from Cavan. Nine were first county records, including *Neottia nidus-avis*, found by Joseph Archibald, Lord Farnham’s gardener. Some were published in *Flora Hibernica* (1836).

Halpin was born in Portarlington in 1790. After a successful academic career at Trinity College, Dublin, he took Holy Orders and was given the curacy of Oldcastle, Co. Meath, near the county border with Cavan. He explored the rich enclosed grounds of Farnham and other demesnes north of Cavan town, visited friends at Mount Nugent and his brother Charles, a medical doctor and botanist, who lived in Cavan town. Dr Charles Halpin worked in Cork before he came to live in Cavan and corresponded with his brother Nicholas. His letters contained botanical records collected by him in Cork, which Nicholas included in his annotations. One, *Coronopus didymus*, is credited to Charles Halpin in *Flora Hibernica* (1836).

Halpin’s botanical predecessors searched the wild untended areas of Cavan for unrecorded plants. An analysis of Halpin’s records show that the majority were found within demesnes or the grounds of private residences. Of his fifty-eight Cavan records: twenty-six were found in Farnham Demesne, seven at Arley Cottage (a substantial dwelling at Lough Sheelan owned by the Farnham family), two at the Deer Park, Virginia (the residence of the Earl of Bective), two at the See House, Kilmore (the residence of the Bishop of Kilmore) and four at or near Churches. Halpin’s

Cavan records include: *Lathraea squamaria*, *Listera ovata*, *Ophioglossum vulgatum*, *Platanthera bifolia*, *Potamogeton lucens*, and *Sagittaria sagittifolia*.

Joseph Archibold (1784-1874)

The earliest extant herbarium specimen of a flowering plant from Cavan - *Monotropa hypopitys* - was collected c.1830 by Joseph Archibold the gardener at Farnham Demesne, north of Cavan town. Archibold was a friend of Halpin, recruited by him to collect specimens and records for Mackay's *Flora Hibernica* (1836). This record is mentioned in Halpin's annotations. The specimen was given to Mackay who labelled it 'Farnham Wood, near the lake. Mr Archibold, ex. Herb. J.T. Mackay. Fl. Hib'. Mackay presented it to the Herbarium at Trinity College, Dublin, where it is still preserved. A Cavan specimen of *Mentha ×piperita* was also discovered in Trinity College herbarium. It is labelled 'Lakeside at Farnham. Flora Hib. (1836). part 1, p. 212. J.T. Mackay'.

George Dickie (1812-1882)

Dickie was born in Aberdeen. He came to Belfast in 1894 to take up an appointment as Professor of Natural History. He was the author of *Flora of Ulster* (1864). This book mentions one important early Cavan record: *Cladium mariscus* 'lakes in Fermanagh and Cavan, Mr Templeton' i.e. John Templeton (1766-1825) of Belfast.

David Moore (1808-1879)

David Moore, a native of Dundee, came to Dublin in 1828, as assistant to James T. Mackay at the Trinity College Gardens. In 1834 he was appointed botanist to the Ordnance Survey and in 1836 became Curator at the Royal Botanic Gardens (now the National Botanic Gardens), Glasnevin, Dublin. He collected aquatic plants in the waterways around Belturbet (c.1860) and contributed six herbarium specimens to the National Botanic Gardens, three of which were new county records: *Ballota nigra*, *Bromus racemosus* and *Potamogeton ×zizijii*. His major botanical work (with A.G. More) was *Cybele Hibernica* (1866). It contains a further four new Cavan records: *Carex vesicaria*, *C. pseudo-cyperus*, *Potamogeton rufescens* and *P. gramineus*. Moore's first county record for *Potamogeton obtusifolius* is given in the 2nd edition of *Cybele Hibernica* (1896).

Dr William E. Steele (1816-1883) came from Belfast to Dublin as Director of the Science and Art Museum. He was an active botanist and collected *Chrysosplenium oppositifolium* (1861) and *Glechoma hederacea* (1862) in Cavan (DBN).

Samuel Alexander Stewart (1826-1910)

Stewart was the grandson of emigrants from Ballymena, who settled in Philadelphia. In 1837, the family returned to live in Belfast. Stewart, a

dedicated botanist and geologist, was a founder member of the Belfast Naturalist's Field Club and curator of the Belfast Natural History Society Museum. He was the author of two important botanical papers published by the Royal Irish Academy relating to the flora of Cavan:

Report on botany of the mountainous portion of Co. Fermanagh to the west of Lough Erne and the adjoining district of Co. Cavan (1882) and *Report on the botany of Lough Allen and the Slieveanierin Mountains* (1885).

These papers contain a substantial number of first county records for Cavan. Praeger acknowledged them as one of his principal sources of Cavan records in *Irish Topographical Botany* (1901). Stewart was a very careful recorder, noting all the plants he saw both common and rare. The following is an extract from his Lough Allen paper:

'The list which follows includes only plants which were actually seen. A few, doubtless, were overlooked, and a very few plants of early spring were missed; but it is not allowable to assume their occurrence, even though they be of the commonist [sic.] types?'

His first publication (1882) contains two hundred and eleven species not then recorded in Cavan. Halpin had already noted twelve other species recorded by him in his annotations, a further four by Mackay, two by Walford, one by Rutty and one by Scott. Some seventy Cavan records on Stewart's list are described as being 'everywhere', 'abundant', 'common on hills', 'meadows and damp ground' etc. These descriptions are taken to mean that the plants were seen in both Cavan and Fermanagh.

The *Report on the botany of Lough Allen ...* (1885) overlaps into Cavan at Dowra and Slievenakilla, on the border with Leitrim. In all, this paper provides twenty-four new Co. Cavan records. Stewart recorded two of these first county records at the Shannon Pot, which is in Cavan on the far side of Glangevlin. Cavan records in Stewart's 1882 paper are not repeated in the Lough Allen list unless a site is given. His record of '*Aegopodium podagraria* Drumkeeran, Co. Cavan' is excluded, as I believe the Drumkeeran he refers to is in Co. Leitrim.

Rev William F. Johnson (1852-1934) of Armagh, a school-teacher and botanist, collected *Carex pulicaria* near Arvagh in June 1883 (DBN).

Richard P. Vowell (d. 1911) an associate of Colgan, Barrington and Hart found *Utricularia minor* at Finnea in 1887 (DBN).

Henry Corbyn Levinge (1831-1896) of County Westmeath and the Indian Civil Service, collected *Geranium dissectum* at the railway station, Cavan in August 1888 (DBN).

David McArdle (1849-1934) bryologist and author of '*A list of the Irish Hepaticae*' (1904), was employed as a plant collector by the Royal Botanic

Gardens, Dublin. In 1893, he made an excursion to Cavan, visiting ‘Slieve Glah, adjacent lakes ... and Lough Oughter’, where he discovered five new county records. He reported on the vegetation in the woods and lakes near Killykeen. At nearby Lough Cultra he recorded *Juncus bulbosus* and on the eastern side of Lough Oughter he saw ‘stately specimens of *Abies alba*, of huge dimensions, several species of *Quercus*, *Sorbus aucuparia*, *Aesculus* sp. and enormous specimens of *Fagus*’. He also found *Sagina nodosa* ‘sparingly by the margins of the lake’ (McArdle 1898).

SUMMARY OF RECORDS FROM
THRELKELD (1726) TO McARDLE (1898)

Author	Date of work	No. of records
Caleb Threlkeld	1726	1
John Rutty	1739	8
Robert Scott	1802	10
J.T. Mackay	1806-7	2
J.T. Mackay	1806	2
Thomas Walford	1818	2
Nicholas J. Halpin	1825-36	57
Mrs E. Tenant	c. 1830	1
Joseph Archibald	c. 1830	1
Samuel Stewart	1882	211
” ”	1885	24
Rev W. F. Johnson	1833	1
Dr W. E. Steele	1862	2
J.T. Mackay	1836	2
George Dickie	1864	1
David Moore	1866	10
R.P. Vowell	1887	1
Henry C. Levinge	1888	1
David McArdle	1898	5
Grand total by 1898		342

Records from the above sources are in Appendix 1 and the species list.

THE PRAEGER ERA, 1885-1953

Robert Lloyd Praeger (1865-1953) dominated Irish botany for the sixty-six years, between 1885 and 1951. His father was a linen merchant who immigrated to Belfast from The Hague in 1860. Robert was born in Hollywood, County Down, qualified as a civil engineer in 1886, worked at the Alexandra Dock, Belfast and various sites in the north of the country. From an early age his main interest was the study of natural history. He became a member of the Belfast Naturalists' Field Club, first taking part in their outings and later, as a committee member, organising them. He decided to leave Belfast, abandon engineering and devote his life to natural history. In 1893, he secured an appointment as Assistant Librarian in the National Library of Ireland, Dublin. He joined the Dublin Naturalists' Field Club and used it as a base for 'The Irish Field Club Union', designed to study the natural history and botany of the entire country. In 1920, he became Librarian of the National Library. He retired from this post in 1923 to devote all his time to botanical work (Collins, 1985).

Praeger made a major contribution to the botany of Cavan. He began his long association with the county in 1885 with his first paper, *Notes from Lough Sheelan, County Cavan* (Praeger 1885 and 1892). He returned many times and wrote about his visits in the *Irish Naturalist* and later in the *Irish Naturalists' Journal*.

In 1901, the Royal Irish Academy published *Irish Topographical Botany* (1901), his most important botanical work. His aim was to provide; '(1) the latest localised and dated record for each plant, with an authority; and (2) a brief indication of the frequency or distribution of the species in the division...' (RLP xcii 1901). He referred his readers to the second edition of *Cybele Hibernica* (1898) and the bibliography in *Irish Topographical Botany* (1901), for historical information and the names of the original finders of plants. Praeger acknowledged three principal sources of information for Cavan in *Irish Topographical Botany* (1901): Stewart's 1882 Fermanagh and Cavan lists (235 species), Alexander Somerville's list of 280 species, and lastly his own listing of 450 species.

His method of collecting data for ITB was to use copies of the *London Catalogue of Plants* to record in the field. A separate catalogue was used for each county he surveyed. His catalogue of Cavan plants is in the Library of the National Botanic Gardens, Glasnevin, Dublin. Praeger spent seven days on this project, recording in the centre of the county at Lough Oughter, Farnham, Slieve Glah and at Lough Sheelan and Lough Ramor. He compiled a list of 450 species, most of which he saw himself - the remainder were seen by people he deemed to be reliable botanists. Thus he fulfilled his first criterion by having 'the latest localised and dated record, with an authority for each plant'. This list confirmed many old records and added new ones. In 1901 the Cavan flora numbered 500 species.

During his explorations of the countryside, Praeger made many botanical friends who assisted him in gathering records for *Irish Topographical Botany* (1901) and updating the information after its publication. Jean M. Cole of Cloverhill and Charles Faris of Farransee - later Mr and Mrs Faris - were two Cavan botanists who contributed many new records. They were highly regarded by Praeger. He wrote that they '*added considerably to our knowledge of the distribution of flowering plants and advanced materially our knowledge of the flora of Cavan*' (*Additions* 1946).

Records gathered after the publication of ITB (1901) were published in eight supplements, written by Praeger and issued by the Royal Irish Academy between 1901 and 1951. They were collected by himself, his botanical associates or taken from notes in the *Irish Naturalist*, the *Irish Naturalists' Journal* and *Watsonia*. In 1950, aged eighty-five, and sixty-five years after he published his first Co. Cavan paper, Praeger, in his methodical manner, handed on the work he loved and had done so well, to Professor David Webb, of Trinity College Dublin (*INJ*, **10**, 1950, 21). He continued to publish papers on botany and botanists until the year of his death, 1953.

Praeger published several books and a number of articles in the *Irish Naturalist* and the *Irish Naturalists' Journal*, which contain references to the Cavan flora. These are listed in Appendix 2.

1950-2000

Individual botanists, members of the Botanical Society of the British Isles, the Dublin Naturalist's Field Club and the Belfast Naturalist's Field Club, attend field meetings in Cavan and continue to contribute to the species list. Reports are published in *Irish Naturalists' Journal*, or *Watsonia*. A list of these botanists (and some pre-Praeger subscribers not previously mentioned), their contributions relating to the botany of Co. Cavan, year of publication (or recording in the case of annotations, or finding in the case of herbarium specimens) is given, together with brief biographical information in Appendix 3. Recording cards containing records attributed to PR and BSBI in the species list are deposited in **DBN**.

Atlas 2000 was a major project initiated by the BSBI and designed to map the flora of the islands of Ireland, Britain, the Isle of Man and the Channel Islands. A 10 km square recording unit was selected and records were collected within a time frame of the four years between 1997 and 2000. Provision was made for the inclusion of historical records i.e. records collected before 1970. County recorders were responsible for providing, as near as possible, 300 records for each 10km square in their county. County Cavan was included and the records collected by the author are in the species list of this work and in *Atlas 2000*.

COUNTY CAVAN HERBARIUM SPECIMENS

The National Herbarium, Glasnevin, Dublin, contains three hundred and sixty seven specimens collected in County Cavan (in 1995). Praeger contributed one hundred and twenty-seven of this number, Miss M.J.P. Scannell, former head of the National Herbarium, collected a further one hundred and twelve and a further ten she gathered with R.C. Faris. The remainder were contributed by: Dr David E. Allen, Mrs A. Bainford, Thomas J. Barron, Sarah Blackwood, Con Breen, James P. Bruncker, P.J. Cahill, Jean Cole, H.V. Corley, Crejuin of Brussels, Farrell, Jeffrey and Lamb, Charles Faris, Philip Grant, Sean Howard, W.S. Irving, Clive Jermy, W.F. Johnson, Lord John Kilbracken, Patrick McGarr, Mrs McNaughton, Kate Monahan, David Moore, Dr E. Charles Nelson, P. Reilly, William Edward Steele, Dr Stuart, Donal Synnott, A.A.P. Toher, Richard P. Vowell.

The Herbarium, Trinity College, Dublin, has twenty-three herbarium specimens collected in County Cavan, including: *Monotropa hypopitys* collected by Joseph Archibald, the first specimens from the county, and *Mentha × piperita* collected by J.T. Mackay [ca. 1830]. Robert Lloyd Praeger presented *Carex aquatilis*, J.P. Bruncker *Lathyrus palustris*, and M.J.P. Scannell *Luzula pilosa*. The remaining eighteen were contributed by Professor David Webb: *Cerastium glomeratum*, *Calystegia sepium*, *Callitriche intermedia*, *Dryopteris affinis*, *D. filix-mas*, *Epilobium palustre*, *Euphrasia brevipila* × *E. nemorosa*, *Juncus acutiflorus*, *J. acutiflorus* × *articulatus*, *Polygonum minus*, *Polypodium vulgare*, *Potamogeton filiformis*, *P. lucens*, *P. natans*, *Samolus valerandi*, *Sedum telephium*, *Taraxacum webbii*, and *T. lingulatum*.

Specimens collected in Co. Cavan are also lodged at the British Museum: two *Rubus* contributed by Dr D.E. Allen and six *Potamogeton* collected at Belturbet (contributors unknown). The Royal Botanic Garden, Edinburgh has one pondweed collected by Alexander Somerville near Ballyconnell. A further three pondweeds collected by PR near Lough Ramor were donated to The Institute of Terrestrial Ecology, Monks Wood, Huntington. C.D. Preston of ITE, recorded and collected extensively in 1996 and contributed to **DBN** and **ITE**.

OTHER RECORD SOURCES

The *Census Catalogue of the Flora of Ireland*. M.J.P. Scannell and D.M. Synnott. 2nd edition 1987. pp. 171. A list of all the native vascular plants and established aliens known to occur in Ireland and their distribution in terms of vice-counties, including species recorded for County Cavan.

Sources for the Census Catalogue of the Flora of Ireland, references for vice-county records of vascular plants 1934-1985. M.J.P. Scannell and D.M. Synnott. 1989. Occasional Papers, National Botanic Gardens, Glasnevin, Dublin. No. 3, pp. 84. This paper lists the sources for all of the first vice-county records of vascular plants made since the publication of

The Botanist in Ireland (1934) and included in the second edition of the *Census Catalogue of the Flora of Ireland* (1987).

Records for the Census Catalogue of the Flora of Ireland in the Herbarium, National Botanic Gardens, Glasnevin. M.J.P. Scannell and D.M. Synnott. 1990. Occasional Papers, National Botanic Gardens, Glasnevin, Dublin. No. 5, pp. 42. This paper contains details of the herbarium specimens cited in the foregoing publication.

The ***Irish Red Data Book: 1 Vascular Plants.*** T.G.F. Curtis and H.N. McGough. 1988. Pp. 168. 'An inventory of the rare and threatened flowering plants and ferns of Ireland with an account of their present distribution and conservation status'. Eight plants found in Cavan are mentioned:

Trollius europaeus L. A Protected Species in the Republic of Ireland and a Scheduled Species in Northern Ireland. Discovered in 1995. One recent station in Cavan.

Cardamine amara L. Classified as 'Rare'. Confined to the northern counties. Two recent stations in Cavan.

Monotropa hypopitys L. A Scheduled Species in Northern Ireland. Last recorded in Cavan in ca. 1830.

Primula veris L. A Scheduled Species in Northern Ireland. Recently recorded in Cavan at two stations.

Lathyrus palustris L. A Scheduled Species in Northern Ireland. Last recorded in Cavan in 1949.

Sisyrinchium bermudiana L. A Scheduled Species in Northern Ireland. Two stations in Cavan. One recent.

Pseudorchis albida (L.) A & D Love. A Protected Species in the Republic of Ireland and a Scheduled Species in Northern Ireland. Three recent stations in Cavan.

Ophrys apifera Huds. A Scheduled Species in Northern Ireland. Two stations in Cavan, one recent.

SOCIAL AND LAND-USE CHANGES

Since the publication of *Irish Topographical Botany* (1901) and the supplements (1901-1951), a number of social and land-use changes occurred which effected the composition and distribution of the flora.

(1) The closure of the railway network and sub-stations which served the county, the removal of tracks, sleepers and the stone-bedding which was the principal habitat for railway aliens. The railway lines have been incorporated into adjoining farmland or roads have been constructed over them. *Minnartia hybrida*, *Sisymbrium orientale*, *Cerastium fontanum* and *Erysimum cheiranthoides* have not been recorded recently. The old lines and stations can be traced on the O.S. 6 inch maps.

(2) Changes in agricultural practice, principally replacing tillage with pasture, have caused a decline in agricultural weeds. *Avena fatua*, *Scandix pecten-veneris*, *Agrostemma githago*, *Thlaspi arvense* and *Chrysanthemum segetum* are now very rare if not extinct. *Fumaria* spp., *Papaver rhoeas* and *P. dubium*, associated with arable land are recorded on disturbed waste ground on two sites only.

(3) An increase in the popularity of gardening has resulted in the dispersal of garden plant seeds into the wild, by wind, birds and dumping of garden refuse. *Hesperis matronalis*, *Crocasmia* spp., *Symphytum ×uplandicum*, *Aconitum* spp., *Rhododendron ponticum*, *Lonicera nitida*, *Fuchsia* spp., *Symphoricarpos albus* and *Cotoneaster* spp. are examples.

COASTAL PLANTS

One group of immigrant plants merit attention, and some consideration regarding their origin and mode of entry into the county. These are coastal plants, found mostly in mid-county in a variety of habitats. The number of species is noteworthy. Most of the first arrivals (1825, 1882, 1896, 1901, and 1938) probably used the same means of ingress and dispersal as the better-known railway aliens. Their route was confined to the rail-tracks and stations, so distribution was predictable and limited. Most of the railway aliens proved to be ephemeral and rarely survived the closure of the stations and dismantling of the rail network. After the end of the war in 1945, road transport replaced railways as the principal goods carrier. Road vehicles are not tied to fixed routes, they can change with each journey; so the collection and distribution of seeds and viable plant parts can be from and to wider areas. The motor car is used extensively for business and pleasure and is the most likely carrier of living plant material from the coast inland.

The occurrence of coastal plants along British inland roads has been the subject of a number of papers in BSBI news. The species most frequently mentioned is *Cochlearia danica*, which now colonises the shoulders and central reservation of many dual carriageways and motorways in Britain (Roper, *BSBI news* 71, 1996). Others have reported *Atriplex littoralis* (Bungard and Leach, *BSBI news* 59, 1991), *Aster tripolium* (Cooke, *BSBI news* 66, 1994),

Puccinellia distans (Scott, *BSBI news* 56, 1990), *Armeria maritima* (Lewis and Marshall, *BSBI news* 84, 2000), *Spergularia marina* and *Limonium* sp. (Palmer, *BSBI news* 73, 1996). *Cochlearia danica* has also been reported inland along main roads in Northern Ireland (McNeill, *Ir. Bot. News* 2000) and on various non-roadside sites associated with railway lines in the Republic of Ireland. It was also found along a main road in Co. Kildare, H19 (Wyse Jackson, *BSBI news* 85, 2000).

The British plants are, in the main, halophytes, for which the natural habitats are saltmarsh, muddy seashore or low cliffs subject to sea spray. Salt is used liberally on British roads during the winter months to prevent ice formation, and most authors attribute the spread of these plants to this practise. Salt is seldom used on Irish roads because periods of freezing weather are less frequent and of shorter duration. The Cavan maritime plants tend to have their origin further back from the sea, in the area where sand gives way to soil.

The following coastal plants were recorded in Cavan: *Carex otrubae*, *Centaureum erythraea*, *Conium maculatum*, *Cuscuta epithymum*, *Daucus carota*, *Echium vulgare*, *Euphorbia portlandica*, *Fumaria officinalis*, *Geranium pratense*, *Isolepis cernua*, *Lemna gibba*, *Ranunculus sceleratus*, *Rosa pimpinellifolia*, *Salix repens*, *Sedum anglicum*, *Senecio erucifolius*, *Smyrniolum olusatrum*, *Thymus polytrichus*, *Tripleurospermum maritimum*, and *Zannichellia palustris*.

RECENT SIGHTINGS

Amongst important recent sightings of plants not recorded in County Cavan for some time are: *Chaerophyllum temulentum* (previously seen 1911), *Cystopteris fragilis* (1946), *Drosera intermedia* (1825), *Ophrys apifera* (1920), *Saxifraga hypnoides* (1802), and *Sisyrinchium bermudiana* (1948).

New county records include: *Armoracia rusticana* (1989), *Buddleja davidii* (1997), *Cardamine amara* (1996), *Dipsacus fullonum* (1990), *Impatiens glandulifera* (1989), *Senecio erucifolius* (1998), *Sparganium angustifolium* (1997), *Spirodela polyrrhiza* (1990), *Tamus communis* (2001), *Trollius europaeus* (1995), *Vulpia myuros* (1996), *Zannichellia palustris* (1996), as well as many *Potamogeton* (1996) and *Rubus* spp. (1988, 1989 & 1990).

A decrease in *Nymphaea alba* was observed while *Nuphar lutea* continues to flourish. Bog drainage is responsible for a decline in *Osmunda regalis*. Intensive and extensive quarrying is reducing and obliterating important sites e.g. Knocknagiolla Quarry on the main Cavan-Dublin road is nearly cleared, and work has recommenced in the quarry at Bruse Hill once noted for its rare ferns.

BOTANICAL DISTRICTS AND BOTANICAL RECORDING

The vice county boundaries devised by Praeger (1901) and amended by Webb (1981) are used for biological and botanical recording. A map depicting all forty vice counties is published with *Census Catalogue of the Flora of Ireland* (Scannell and Synnott, 1972 and 1987). Co. Cavan is designated as vice-county H30.

The three great Irish county floras of the twentieth century: *Dublin* by Colgan, *Kerry* by Scully and *Wicklow* by Brunner, used baronies as the basis for botanical subdivisions of their counties. Colgan (1904) wrote:

'... the barony boundaries are extremely difficult to recognise in field work, by reason of their complexity and their divergence from such obvious natural or artificial lines of division as streams and highways, that it has been found necessary to deviate from them frequently when defining the botanical districts.'

For the *Flora of County Carlow* (1979), Evelyn Booth and M.J.P. Scannell used divisions based on five physiographic regions outlined in the *Soils of County Carlow* (Conroy and Ryan, 1967).

As the very precise ½ inch Ordnance Survey maps (1980 and 1985) are now used by most botanical recorders, the opportunity is taken to show divisions by using the grid lines on these maps. Parts of County Cavan are depicted on four half-inch maps and form the basis for the five botanical districts described below. The numbers 1 to 5 with each species indicate the divisions where the plant was recorded.

No practical difficulties were experienced in the field locating and describing sites with reference to these boundaries. A map and topographical index appears on pages 158–164.

DISTRICT 1. (Map 7, Sligo-Leitrim. The part of County Cavan west of grid line 220.)

The greatest variation in elevation occurs in this district, ranging from 54 m (174 ft) at Loughan House near Blacklion, to 667 m (2,188 ft.) on Cuilcagh mountain. To the north-west lie the limestone outcrops at Corratirrim (Plate 1) and Legalough. The limestone extends down to the lakeshore level of Lough Macnean and is visible in caves near Loughan House. To the south are Benbrack and the heights of Moneenteriff. Across the valley, the mighty Shannon has a modest beginning in the Shannon Pot on the high ground near Gowlan. By the time it reaches Dowra, just 10 km from its source, it has become a formidable river. The Swanlinbar and the Owenmore rivers traverse the valley of Glangevlin overlooked by the highest mountains in the county (Plate 2). The Bellavally gap, between Benbrack 495 m (1,635 ft) and Cuilcagh 667 m (2,188 ft), makes an imposing entrance to the valley. Brackley Lough west of Ballyconnell and Upper Lough Macnean, forms a watery border with Fermanagh and

Leitrim. The land surface varies from good drift-covered agricultural land in the valleys to sparse grassland with bare rock outcrops and cliffs on the high ground. Except for one large patch of hazel scrub on limestone near Legalough, natural woodland does not occur. A dense coniferous forest was planted in the Burren area west of Gowlan. Blanket bog covers the upper slopes of Cuilcagh at Blackrocks Cross and the limestone slopes of Corratirrim.

A contrast in vegetation types occurs on the Swanlinbar approach to Cuilcagh via Lake Cratty. The location is Greenan Rock, a limestone cliff on the border with Fermanagh, visible from the mountain path before the coniferous forest on the 270 m (900 ft.) contour line. *Arabis hirsuta*, *Cystopteris fragilis* and *Sesleria albicans* grow on a cliff beside the nearby calcifuge vegetation: *Calluna vulgaris*, *Carex echinata*, *Eriophorum vaginatum*, *Juncus squarrosus*, *Narthecium ossifragum*, *Pinguicula vulgaris* and *Platanthera bifolia*.

Other productive areas in this district at lower elevations, with examples of the plants found recently, are:

Corratirrim and Legalough, 244 m (800 ft.).

Antennaria dioica, *Campanula rotundifolia*, *Cystopteris fragilis*, *Juncus squarrosus*, *Meconopsis cambricum*, *Ophioglossum vulgatum*, *Pseudorchis albida*, *Salix repens*, *Saxifraga hypnoides*, *Selaginella selaginoides*, *Sesleria albicans*, and *Taxus baccata*.

Near the Shannon Pot, 122 m (400 ft.).

Equisetum sylvaticum, *Platanthera bifolia*, *Salix pentandra*, and *Viola palustris*.

North of Dowra, 61 m (200 ft.).

Equisetum ×willmotii, *Isoetes lacustris*, and *Osmunda regalis*.

Upper Lough Macnean, 54 m (174 ft.).

Galium boreale, *Equisetum ×litorale*, *Melica uniflora*, and *Trollius europaeus*.

Limestone caves near Loughan House, 54 m (174 ft.).

Cystopteris fragilis and *Polypodium cambricum*.

Map 8 (Monaghan-Armagh) covers Districts 2 and 3, separated by the north-south grid line 250, passing through Stradone, east of Cavan town, making two districts of manageable size, east and west of this line. The southern boundary is the east-west grid line 300 at the bottom of the Ordnance Survey map.

DISTRICT 2. (Map 8, Monaghan-Armagh. The part of County Cavan between grid-lines 220 and 250 and north of grid line 300.)

The district includes Killykeen Park, Killashandra, the intricate body of lakes called Lough Oughter and the border lakes north of Belturbet up to

Bloody Pass. To the east are the townlands of Ballyhaise, Redhills and Butlersbridge, to the west lie Ballyconnell and Slieve Rushen.

Lough Oughter is in the central section of this district. It consists of the Erne basin between Crossdoney and Bakers Bridge. Here the Erne ceases to be a river and becomes a broad series of inter-connecting lakes. Most of the ground lies between the 61-91 m (200-300 ft.) contour lines. The river has a very low gradient in this area, being only 3 m (10 ft.) above the level of Lough Erne which receives its flow (Farrell, 1972). In addition, Lough Oughter acts as a water storage area for the hydroelectric scheme at Ballyshannon. The placid state of the lake water, together with the heavy winter rains, causes an annual rise in the water level and an inundation of the shoreline, the extent of which can be seen at the highest debris line (Plate 13). The drumlin belt passes through the lake and the waters hide the base of the hills, in some places to a depth of 10 m (33 ft.). Here the shoreline is very steep and usually covered with gravel. Excepting places near the lakeshore where electric fences have been introduced, grazing is restricted to the higher ground, providing an opportunity for deciduous trees to colonise the shoreline. In still, shallow water, silt accumulates and large beds of *Phalaris arundinacea*, *Rumex hydrolapathum*, and *Schoenoplectus lacustris* are established, notably at Killykeen. *Lemna gibba* and *Menyanthes trifoliata* grow on the inner or landward side of these beds while *Butomus umbellatus*, *Nuphar lutea*, *Potamogeton pectinatus*, *Rumex hydrolapathum* and *Schoenoplectus lacustris*, are found on the inner or lakeside of the reeds. Where the shore grades into marsh, *Epilobium hirsutum*, *Lytbrum salicaria* and *Lysimachia vulgaris* are common.

The land portion of Lough Oughter consists of a variety of islands and peninsulas, even more intricate than the waterways. It is, however, well served by roads, but many of the peninsular ones are narrow.

The following is a personal selection from an area with a wealth of good sites. The lake shores and forest paths are worth visiting but a boat trip on the lake is even more rewarding:

Killykeen; the Eonish peninsula at Killashandra; Rinn; Flynn's Pass; the woods by Farnham Lake; the lakes north of Belturbet.

The area north of Bakers Bridge to Belturbet contains many other lakes of interest to the botanist, including Bun Lough, Round Lake, Putiaghan Lake and Commons Lake.

North of Belturbet the Erne flows to Drumard, Anoneen and Amoneen lakes. These lakes are shallow; depths of 2 m (6.5 ft) are common. The water flow is slow, but not stagnant, providing an ideal habitat for a variety of aquatic plants. This section is now part of a motorboat trail. The propellers agitate the water at the reed beds where the most important plants are found. This will affect the stability of the beds and have a

detrimental effect on a valuable and sensitive habitat.

Most of the important aquatic and woodland plants in this district are found in Lough Oughter, Belturbet and the lakes to the north:

Baldellia ranunculoides, *Butomus umbellatus*, *Carex pseudo-cyperus*, *Epilobium roseum*, *Euonymus europaeus*, *Hydrocharis morsus-ranae*, *Lathraea squamaria*, *Lemna gibba*, *Leucosium aestivum*, *Lobelia dortmanna*, *Myriophyllum alterniflorum*, *Moebingia trinervia*, *Oenanthe fistulosa*, *Pulicaria dysenterica*, *Rumex hydrolapathum*, *Sagittaria sagittifolia*, *Silene dioica*, *Sium latifolium*, *Spirodela polyrrhiza*, *Stratiotes aloides*, *Thalictrum flavum*, *Thelypteris palustris*, and *Zannichellia palustris*. *Vulpia myuros* is also found in this area.

The marsh at Annagh Lough north of Butlersbridge has *Carex pseudo-cyperus*. *Thelypteris palustris* is well established at the Bun Lake marsh and *Hydrocharis morsus-ranae* survives there in a drain. At Round Lake on the Redhills road, *Cladium mariscus* and *Stratiotes aloides* were found in the lakeshore marsh. *Carex elongata* and *Thalictrum flavum* are at Annagh Lough, south of Ballyconnell and *Butomus umbellatus* and *Potamogeton salicifolius* at Belturbet. *Cardamine amara* was recently found at two sites near Ballyhaise. The highest ground in the district is at Slieve Rushen 406 m (1,331 ft.) north of Ballyconnell, but much of the mountain is covered by coniferous forest.

DISTRICT 3. (Map 8, Monaghan Armagh. The part of County Cavan east of the grid line 250 and north of gridline 300.)

This predominantly Silurian district repays dedicated walking over rough high ground and its lakes remain relatively unknown. A number of rare plants have been found recently including a fourth Cavan site, Drumhillagh, for *Pseudorchis albida* with *Taxus baccata* nearby.

The Bellamont estate (with accessible lakes and mixed forest) is at Cootehill. Town Lake and Coragh Lake lie to the north-east of the town. To the south-east, the Annalee River rises at Tacker Lough and winds westwards, via Cootehill and the drumlin area at Ballyhaise, and thence to Butlersbridge, where it merges with the Erne. The Dromore and the Laragh rivers join the Annalee from the north and the south. Lough Sillan (3 km long) with easy access from the Cootehill Road, is north of Shercock. Skeagh Lough, north of Bailieborough, is also in this district. *Isoetes lacustris* and *Lobelia dortmanna* are found there.

On the Canningstown - Shercock road, Roosky Lough is accessible at several places and Corraneary Lough (with stepped limestone outcrops on the shore) can be approached by a track behind the Church of Ireland. The highest ground in the district is north of Mountain Lodge (H15904) 262 m (862 ft.) and north of Crossmakekelan (H7301) 292 m (985 ft.).

Interesting species recorded in the district recently include:

Dryopteris carthusiana, *Epipactis helleborine*, *Hydrocharis morsus-ranae*,

Lathraea squamaria, *Leucojum aestivum*, *Ranunculus peltatus*, *Rhinanthus minor*, *Scrophularia auriculata*, and *Valerianella locusta*.

DISTRICT 4. (Map 12, Longford-Roscommon. The part of County Cavan west of gridline 250 and south of gridline 300.)

Lough Sheelan is in this limestone land on the border with County Meath. The lake is 1,800 hectares (4,500 acres) in area and measures 7 km (more than 4 miles) between Finnea and Mount Nugent. The eastern or Mount Nugent side is in the form of a sheltered bay, where the water is very shallow at the shore and for some distance into the lake. The lakebed and shoreline is composed of fine silt. An extensive area of reeds and marsh vegetation is established along the shore and well-developed beds of Charophytes grow in the shallows (Plate 3). South of Mount Nugent the shore becomes stony and deciduous trees grow along the water's edge. The western side of the lake is more affected by wind and wave action and has a broad band of stony shore and gravel, which grades into fine silt in the water (Plate 4). There is a more extensive deciduous wood behind the lakeshore. The boating ponds on this side of the lake are good hunting grounds for pondweeds.

The Erne rises in Lough Gowna and flows north, entering limestone country near Crossdoney. The eastern arm of the river follows a winding path north-east to the Corglass-Drumbarry area.

At Bruse Hill (261 m, 856 ft) east of Arvagh, the rare ferns *Cryptogramma crispa*, *Hymenophyllum tunbrigense*, *H. wilsonii* and *Phegopteris connectilis* were recorded. Most of the hill is now used for grazing. The eastern side is a working quarry (Plate 6). Rare fern sites were usually small, and sensitive to human and animal interference. They require a stable environment, shade and moisture to survive.

Other records for this district include:

Arabidopsis thaliana, *Baldellia ranunculoides*, *Callitriche platycarpa*, *Cirsium dissectum*, *Juncus squarrosus*, *Nardus stricta*, *Ophrys apifera*, and *Pinguicula lusitanica*.

DISTRICT 5. (Map 13, Meath. The part of County Cavan east of gridline 250 and south of gridline 300.)

The main water-body is Lough Ramor; shaped like a '7' and centred on the town of Virginia at its narrowest point. The southern arm extends 5 km (3 miles) to the Meath border, while the 3 km (2 mile) western dog-leg stretches to Enagh Cottage. Its principal feeder is the Virginia River, which enters the lake below the town. A short stretch of the Blackwater flows from Lough Ramor, south, into County Meath. There are thirty named islands on Lough Ramor, but only two are more than one acre in area. Nadreegeel Lake, another broad area of water, lies to the north-west of

Lough Ramor and there are smaller lakes near Bailieborough and Mullagh. There is an extensive area of raised bog at Cloughbally south-east of Mullagh. Dún an Rí Forest Park is east of Kingscourt. Ervey Lough, south of Kingscourt on the Meath border, is one of the decreasing number of sites where *Nymphaea alba* is found. *Dryopteris carthusiana* and *Stellaria palustris* were recorded recently in the extensive area of marsh at the lake.

The highest ground is at Cornasuas (314 m 1,029 ft) east of Bailieborough, where *Lycopodium clavatum* is well established.

Other species of interest in this District are:

Andromeda polifolia, *Bidens cernua*, *B. tripartita*, *Carex sylvatica*, *Dipsacus fullonum*, *Draba muralis*, *Lathraea squamaria*, *Lycopodium clavatum*, *Mimulus guttatus*, *Myosotis discolor*, *Myrrhis odorata*, *Sedum telephium*, *Senecio sylvatica*, *Vaccinium oxycoccus*, *Valeriana pyrenaica*, *Verbascum thapsus*, *Veronica catenata*, and *Viola palustris*.

ABBREVIATIONS

AFF	An Foras Forbartha reports. See Farrell (1972), and Cabot (1981).
<i>Atlas</i>	Perring & Walters (1962) <i>Atlas of the British Flora</i> 2 nd edition (1968).
BM	Herbarium specimen, British Museum.
BNFC	Belfast Naturalist's Field Club.
BRC	Biological Records Centre, Monk's Wood, UK.
BSBI	Botanical Society of the British Isles.
CFB	Central Fisheries Board.
<i>Census Catalogue</i>	Scannell & Synnott (1987) <i>Census catalogue of the flora of Ireland</i> .
<i>Cybele</i>	<i>Cybele Hibernica</i> (1866); and 2 nd edition (1898).
DBN	Herbarium specimen, National Botanic Gardens, Dublin.
DEA	David E. Allen (<i>Rubus</i>).
DNFC	Dublin Naturalist's Field Club.
E	Herbarium specimen, Edinburgh Botanic Garden.
<i>IN</i>	<i>Irish Naturalist</i> (1892-1925)
<i>INJ</i>	<i>Irish Naturalist's Journal</i> (1925 -)
NCR	New county record
PR	P.A. Reilly
RLP	Robert Lloyd Praeger. (see Appendix 2 for full details):
RLP 1896	Catalogue of Cavan Plants (ms at the National Botanic Gardens, Glasnevin).
RLP 1901	Irish Topographical Botany (or ITB).
RLP 1902	Gleanings in Irish Topographical Botany.
RLP 1906	Irish Topographical Botany Supplement 1901-1905.
RLP 1929	Report on recent additions to the Irish flora and fauna.
RLP 1934	A contribution to the flora of Ireland.
RLP 1939	A further contribution to the flora of Ireland.
RLP 1946	Additions to the knowledge of the Irish flora 1939-1945.
RLP 1951	Hybrids in the Irish flora, a tentative list..
RIA	Royal Irish Academy
TCD	Herbarium specimen, Trinity College, Dublin
<i>Threlkeld</i>	Synopsis <i>Stirpium Hibernicarum</i> (1726; facsimile 1988)

NOTES ON THE FLORA TEXT

The nomenclature and sequence of the species follow those of the *New Flora of the British Isles* (1991 & 1997) by Clive Stace, with a few exceptions, where an alphabetical sequence is followed instead. These are: the generic sequence for the Grasses, and the species in the large genera *Carex*, *Potamogeton* and *Rubus*. Irish and English names are those used in the *Census Catalogue of the Flora of Ireland* (1987) by Mary J.P. Scannell and Donal M. Synnott. In a few cases, where synonyms have been in recent usage, these are given in brackets after the currently accepted name. Species regarded as historical introductions, or recent escapees from cultivation, are signified with an asterisk in front of the name.

The distribution of each species is shown using five botanical districts or divisions of the county. (see map on page 158). Where the plant has been reliably recorded from Cavan, but without an exact locality the district is omitted.

A short note on the usual habitat, or status of the plant, in Ireland is given on the second line.

Recorders of the rarer plants are named. Where no recorder is given, then PR is the recorder. The BRC database records are usually given as '1950+', meaning post-1950 records.

The most frequently used acronyms are:

BRC meaning the Biological Records Centre.

BSBI for the Botanical Society of the British Isles.

DBN for Herbarium specimens in the National Botanic Gardens,
Glasnevin, Dublin

PR for Paddy Reilly

RLP for Robert Lloyd Praeger.

Others are given in the list of Abbreviations on the previous page.