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OF

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ORGAN OF THE

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Belfast Naturalists' Field Club; Dublin Naturalists' Field Club;
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AND

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THE IRISH NATURALIST.

VOLUME XXVI.

# THE CHARACEAE OF FANAD, EAST DONEGAL.

BY REV. CANON G. R. BULLOCK-WEBSTER, M.A.

A visit to friends in the north of Ireland last summer gave me an opportunity, for which I had for some while been waiting, to explore the northern lakes of the Fanad peninsula, East Donegal, with a view to studying their Characeae vegetation. The Ordnance map indicates some very tempting waters at the head of Mulroy Bay where a series of lakes skirts the seaboard and suggests brackish waters, the habitat of some of our rarer species. A train journey from Derry to Fahan, a boat journey across Lough Swilly to Rathmullen and a charming drive of 15 miles eventually brought me and my friend, Mr. Colin Montgomery, to Kindrum, where we stayed for a week (July 27—August 2), spending every available moment in, on or around the loughs which lie close by, and where my companion did me good service both as dragsman and oarsman.

It may be of interest, I think, to record the results of an investigation made with such care as the limits of time and uncertainties of weather permitted. I should say at the outset that a boat was available only on Kindrum Lough ; for the rest I had to be content with wading along the lake margins and dragging from the shores. I have marked with an asterisk the species which appear to be new records for East Donegal.

Rinboy Lough is a shallow piece of water lying on the sand-flats immediately at the back of the sea-beach. It

has a sandy bottom but withal a treacherous one, for here and there the wader finds himself sinking into unexpected quicksands. The bed of the lake yielded an abundant growth of *Chara aspera*, Willd., and its variety *C. desmacantha*,* H. and J. Groves, both in small compact forms and much encrusted. This, and some small growth of *C. fragilis*, Desv., was all that I could discover. Immediately east of Rinboy L. lies a lough not named in the Ordnance map and treated seemingly as part of Lough Kinny, with which it is probably united in the winter when the intervening marsh lands are inundated. I gathered that its local name is Tra Lough. This lake has a thick growth of reeds and of Chara vegetation so rank that it would be difficult to make way in a boat even were the impeding obstacle of rushes removed. The Charas here appeared confined to *C. aspera*, *C. desmacantha*, *C. hispida*,* Linn. and *C. rudis*,* Braun. L. Kinny close by is of very different character; its water for the most part is deep and clear with a stony bottom. Only towards its north shore, where it reaches the sand-flats, does it become rank and dense with vegetable growth. Here again *C. desmacantha* abounds, but in this lake it is a large dark green unencrusted form, very spinous, with long recurved branchlets, looking exceedingly like some forms of *C. canescens*, Loisel. Besides this form was another with short connivent branchlets and long internodes. The other species which I was able to collect by hand or drag were *C. aspera* and its var. *subinermis*,* Kuetz., *C. contraria*, Kuetz., *C. fragilis*, and its variety *delicatula*, Braun. This last grows in great abundance in the stony bed at the south end of the lake—choice little tufty plants some 3–5 inches high, with thick incurved branchlets full of fruit.

Beyond L. Kinny north-eastward comes a small almost circular lake unnamed in the new half-inch ordnance map. It lies immediately under the little hamlet of Ballylar. Here the drag brought up some specimens of *Tolypella*, much decayed, which on examination proved to be *T. glomerata*,* Leonh. An investigation round the shores of the lake revealed other specimens in good condition,

probably a second growth, since *T. glomerata* usually reaches maturity in April and early May. The lough also yielded abundance of *C. contraria*, *C. aspera*, and its var. *subinermis*, and *C. desmacantha*.

Over the shoulder of the hill on which the hamlet of Ballylar stands lies Lough Shannagh. This lake would probably repay careful investigation by boat. It has clear deep water with a stony bottom at its southern, and a sandy bottom at its northern, end. It yielded *Nitella translucens*,* Agardh. in excellent condition, green and fresh, but little else save some *C. aspera* thrown up on the shore by the wavelets, and some immature *C. fragilis*. "Little else," I say, because one large exception must be made. Growing in immense abundance along the western shore of the lake, about 10 yards from the margin and in some 5 or 6 feet of water, was a plant which at present defies identification, unless it be a wholly abnormal form of *N. flexilis*,* Agardh. Mr. James Groves has given some considerable time to examining specimens both of the dried plant and of fresh specimens preserved in solution, but at present it seems difficult to arrive at its identification. It grows in great abundance evidently in a long bank parallel with the west shore, and at the time of collecting was in fine fruiting condition. The plant is monœcious and monarthrodactylous; that at any rate seems clear. Perhaps further investigation, and also examination of specimens collected if possible at an earlier period of the year, may serve to reveal its true species.

I have reserved to the last Kindrum Lough itself as being perhaps the most interesting in its character and yield. The lake lies somewhat southward and thus more inland, and, while shallow in some parts, on its east and north-east side it drops down to a great depth. Here, thanks to the kindness of Lord Leitrim and his local agent, I had the advantage of a boat. I found *C. fragilis*, var. *delicatula*, growing in the beautiful little tufted form of L Kinny, on hard black peat, the plant varying from $1\frac{1}{2}$–5 inches, with short, sturdy incurved branchlets bearing abundance of fruit. Also *C. fragilis*, *N. translucens*, and

*C. desmacantha* in the same dark green unencrusted forms as found in L. Kinny. The drag brought up immense tresses of this plant some specimens measuring 15–23 inches in length growing in 5–6 feet of water, and having the appearance of *C. canescens,* for which I mistook the plant till Mr. Groves' microscope revealed its triplostychous stems. It would be difficult to find more beautiful specimens. But, still more interesting, the lake yielded specimens of the curious L. Shannagh Nitella, and also, adhering to some draggings of *C. fragilis,* were to be detected a few minute pieces of *Nitella Nordstedtiana,** H. and J. Groves. This plant is always too small to allow of its collection by means of a drag. At the same time it was growing in water too deep (10–12 feet) to permit a rake or hoe to reach its bed. I was, therefore, unable to collect more than these chance pieces. However, the specimens are sufficient for Mr. Groves to identify the plant and to establish the fact of the occurrence of this rather rare Nitella in the Fanad peninsula—a notable extension of its area, since so far it has only, I think, been recorded from the Killarney Lakes.

Another interesting plant came up in the drag almost at the same time, not this time a Chara, *Najas flexilis,** Rosk. and Schmidt, till now recorded only from Kerry and Galway.

Near L. Tra I came upon a few small trenches about 2 feet wide and 18 inches deep dug probably last spring. Here Charas were luxuriating in pools of clear, clean water where they enjoyed free play unchecked by any stronger growth. They yielded beautiful specimens of *C. hispida, C. fragilis, C. delicatula,* and *C. contraria* in forms and condition to satisfy the most exacting of characeologists.

I was able also to visit a lake near Melmore Head on the western side of Mulroy Bay—a very interesting piece of water which might have yielded some treasures had a boat been available, for it appeared to abound in Chara growth. Hoe and drag brought up *C. fragilis* and its var. *capillacea,** Coss. and G., *C. contraria* and its var. *hispidula,** Braun., *C. aspera,* and *C. desmacantha* both in small short form and in its large lax form.

Of all the plants which I have here recorded I was able to furnish myself with specimens for careful examination and identification, and I have to thank Mr. James Groves for kindly going through the collection with me and giving his skilled assistance and unrivalled knowledge in determining doubtful plants.

Reviewing the Characeae yield as a whole, two or three facts call, I think, for observation. (1) The small area to which my investigations were confined yielded 8 species and 6 sub-species and varieties of the Characeae. Had a boat been available it seems more than probable that this list would have been enlarged. Should a second visit to this very attractive and interesting locality prove possible another year I shall certainly make efforts to secure the use of a coracle, of which as I gather there are some in the neighbourhood, and trust myself to its precarious stability. (2) The locality seems one likely to yield *C. canescens*, Loisel., and its frequent companion *C. connivens*, Braun. Both these plants frequent brackish water, and this the Kindrum loughs most certainly provide. A more careful search may discover one or another or both. (3) The absence of *C. vulgaris*, Linn. from the neighbourhood is worth noting, and *C. polyacantha*, Braun. might certainly have been expected. I found in one ditch nearly dried up some remains of Chara growth which proved to be *C. vulgaris*, but this is the only trace of the species which I could detect. (4) The prevailing plants it will be observed are *C. contraria* and *C. desmacantha*. These seemed to abound and in many different forms. (5) The fact that the undetermined Nitella of L. Shannagh also occurs in L. Kindrum is not without interest and should afford some clue to its identification. In each case it is growing with *N. translucens* and the possibility of a hybrid suggests itself, but the plant contains, apparently, no traces of the diarthrodactylous branchlets of that species.

St. Michael's Rectory, College Hill, London, E.C.

# THE STATE OF IRELAND.

BY ROWLAND SOUTHERN, B.SC., M.R.I.A.

Study is like the heaven's glorious sun,
That will not be deep-search'd with saucy looks;
Small have continual plodders ever won,
Save base authority from others' books.
These earthly godfathers of heaven's lights,
That give a name to every fixed star,
Have no more profit of their shining nights
Than those that walk and wot not what they are.
Too much to know is to know naught but fame;
And every godfather can give a name.

—*Love's Labour's Lost,* Act I., Sc. 1.

During the present period of intense national introspection, it might be profitable to enquire into the causes of the recent diminution of interest in natural history in Ireland, and more especially of the decrease in numbers of the "amateur" enthusiasts. The reduced membership of the various Natural History Societies, the falling off in the attendances at Field Club excursions, and the contracting circulation of the *Irish Naturalist* are symptoms of this lack of interest. Potent causes are undoubtedly the increased and inevitable specialisation of the modern systematist, and the almost complete cataloguing of the more obvious and easily named animals and plants. These two causes alone, however, are not sufficient to account for the present apathy, for the number of problems awaiting solution is as great as ever, and new discoveries are continually opening up fresh avenues for exploration.

The potency of fashion to mould the form of our activities, and the rarity of initiative in the "rank and file," are obvious even in science. A main cause of the small interest now displayed in Natural History is undoubtedly due to the excessive attention bestowed, during the last twenty years, on the problems of Geographical Distribution. The aims and methods of several of the dominant personalities in our midst have been slavishly followed by their disciples, and the distribution of an organism has come to be regarded as its most important characteristic. The infinite complexity of nature obtains

for its elucidation merely a label and a map. The resulting labours have imparted to the recent literature of Natural History in Ireland, as revealed in the pages of the *Irish Naturalist* and the *Proceedings of the Royal Irish Academy*, an arid and monotonous aspect, well adapted to chill the enthusiasm of the veteran and to quench the budding aspirations of the tyro.

Of recent years it has become the custom to enlarge a systematic paper by a long discussion on Geographical Distribution. The procedure is after this fashion. The writer has obtained possession, let us say, of a collection of sponges from Kerguelen. He compiles a list of the species, with appropriate notes. Then with his list of species, a good atlas, and a complete set of works dealing with sponges, he retires to his lair, and prepares lists of "Sponges found only in Kerguelen and Spitzbergen," "Sponges found only in Kerguelen and Kamtchatka," "Sponges found only in Kerguelen and the Solomon Islands," "Sponges found only in Kerguelen and Clew Bay," and so on. Then he varies the proceedings with lists of "Sponges found in Kerguelen *but not* found in Spitzbergen," etc., etc. Then follow lists of sponges found in Kerguelen and two other localities, sponges found in Kerguelen and three other localities, etc., then sponges found in Kerguelen and one other place, but not found in a third place, etc., etc. And so the dismal narration proceeds, page after page, until somebody sends him another collection from some other distant isle, or an impatient editor gives him a week longer to finish the paper. Of course, nobody ever reads this part of the paper, and one wonders why it was ever written. But it is the fashion nowadays, it is easy, and it exerts the same kind of fascination on the author that some people find in playing patience. Moreover it imparts a fallacious air of broadmindedness, showing that the author has a soul above that of the mere recording fiend. The only solid fact that emerges from such effusions as this is that our knowledge of distribution at present is very imperfect, and will be increased, not by burning the midnight oil, but by collecting more material.

Another monstrous parody of Natural History is what a returned American—if such a one can be conceived as taking an interest in the subject—would call the "county stunt." Some people have objected to the partition of Ireland into only two divisions, but if they only knew! The craze for finding an animal or plant in as many counties as possible has recently been very popular in Ireland. Kerry is its Mecca, the *Irish Naturalist* is its Koran, but it would not be seemly to name its prophet in these pages. Papers after this fashion are even more unreadable than the "Kerguelen" kind, and are often illustrated with weird maps resembling ancient antimacassars. Ardent champions of this game announce with triumph that one of their recent epoch making discoveries constitutes "the eleventh record of this species for County Tyrone," and they select for their collecting trips, places so situated that they can make rapid raids into three or four adjacent counties. As the poet says :—

> Primroses by the river's brim
> New County Records are to him,
> And they are nothing more.

The "county" mania often takes the form of an attempt to divide Ireland into a number of similar "ideal" divisions, each of which would have its lake, river, patch of bog, mountain over 1,000 feet in height, and so on. Surely, if the country is to be sub-divided any more than it is at present, this is a topsy-turvey method of procedure. If the divisions are to portray anything in nature, then the more dissimilar they are the better. Moreover, no system of divisions "satisfactory" to the student of the terrestrial fauna and flora could be applied to the inhabitants of fresh-water, still less to those of the sea. Distributional limits are fixed by ecological, not geographical, conditions, and vary according to the group, or even species, under consideration.

Attempts to express distribution by symbols, numbers, and abbreviations are also to be deplored. They render nauseating an already tedious subject, and any doubtful economies of time and space are more than counterbalanced by the irritation they cause to the reader.

The last attempt to subdivide Ireland, for biological purposes, was that of J. Adams,[1] published in these pages in 1908. Not satisfied with the four provinces and the forty counties and vice-counties, he instituted a new partition into twelve sub-provinces, decorated with names of antique flavour. A British or Continental naturalist, anxious to ascertain the distribution in Ireland of a particular animal or plant, would be greatly edified by learning that he might hope to find it in Tirawly, Tirowen, Offaly, Oriell, and Brefney, or in M 103, L 120, C 003, U 123. It would be necessary to illuminate every paper using these hieroglyphics with a map and a long explanation, by the aid of which the reader would painfully translate them into geographical terms with which he had some familiarity. And yet the proud proprietors of these systems always quaintly advocate them because they save time and space, and convey their meaning in an illuminating flash. In the system proposed by Adams, rivers and lakes are used to a great extent as boundaries, so that unscrupulous hunters of the aquatic fauna and flora might often bring down two sub-provinces with a single specimen. In the original scheme the boundaries of the marine divisions, in nine out of eleven cases, ran up the middle of a bay. In a subsequent note[2] Adams amended this, and moved the boundaries to adjacent projecting parts of the coast, so that the marine divisions ceased to correspond exactly to the terrestrial divisions, thus spoiling the beautiful symmetry which was the chief hope and pride of the original scheme. The seaward boundary of the terrestrial divisions was fixed at low-water mark. Consequently, one shore of nine of the principal bays was in one sub-province down to low-water mark, and in another sub-province below low-water mark. One might catch a crab just above low-water mark in "Desmond," but if the crab were nimble enough, and managed to slip into the water before being captured, it would figure in the records of "Thomond." If that crab had been already recorded from "Desmond," but

[1] *Irish Naturalist*, vol. xvii., 1908, pp. 145-151.

[2] *Ib.* vol. xviii., 1909, pp. 1-2.

not from "Thomond" there would be a strong temptation for the record-hunter to chivy it over the border before capturing it. But such deplorable chicanery could not have occurred to the mind of Mr. Adams, for he says "Species obtained by shore-collecting belong (*naturally enough*) to the county on whose shores they are collected." Nor, apparently, have the vagaries of "low-water mark," as a territorial boundary, troubled him.

But these minor absurdities do not constitute the chief objection to such ready-made faunistic and floristic divisions of a country. They are fundamentally wrong, insomuch as they precede a knowledge of distribution, instead of being based on it. If they are to have any value they must represent the observed limitations of species or groups of species. These distributional limitations must be correlated with the habits and life-histories of the species, and those factors in the environment which prevent their further dispersal. It will then be obvious (as it is now) that each species has its own peculiar distribution, and only two divisions will be necessary to express it, one in which it occurs, and one from which it is absent.

In reading papers on the geographical distribution of the marine organisms occurring in various localities in the British Isles, one often meets such a statement as this: "The fauna (or flora) of our area is a remarkable mixture of northern and southern forms." This announcement is always made with the air of imparting an important discovery, and is usually accompanied by a mass of statistical information. For instance, the following sentence occurs in a recently published paper:—"A study of this table reveals the interesting fact that the marine fauna of the west of Ireland, as far as these orders of Crustacea are concerned, is a blending of northern forms with southern species from the Mediterranean, the latter element somewhat preponderating." It is difficult to see what alternative the writer considered possible. Owing to the usually restricted bathymetrical range of marine organisms, and the general north-south trend of the European coast, the fauna could hardly be a mixture of eastern and western

forms. The absence of any well known and important limiting barrier on our west coast makes it equally absurd to expect that the fauna would have a wholly northern, or wholly southern distribution. The only other alternative would be that the fauna was peculiar to the west coast of Ireland, and occurred nowhere else, which would indeed be an interesting fact! The preponderance of species having a distribution mainly to the south is also what one would expect *a priori*, even when the effects of the warm water of the North European branch of the Gulf Stream, flowing past our west coast in a north, and north-eastern direction, and of the current flowing out of the Mediterranean, the effects of which can be traced as far north as the south coast of Ireland, are left out of consideration. In almost all orders of marine animals, the total number of species diminishes as one travels northwards from the tropics, and consequently there must necessarily be more species, at any given place on the west coast of Europe, having a southern distribution than a northern one. In the same way the marine fauna of the east and west coasts of America, and the east coast of Asia has a mainly north-south distribution, whilst that of the Arctic and Antarctic, and of the south coast of Asia has a distribution mainly east-west.

In the above paragraphs the writer must disclaim any intention of attacking the legitimate study of Geographical Distribution. Though it has not realised all the expectations of its earliest followers, nor yielded results commensurate with the amount of labour devoted to it, it has its real, if subsidiary, function.

The remedy for the present devitalised state of Natural History in Ireland is to return to the study of living things themselves, their physical characteristics, their adaptations and habits, and their reactions to the environment. When an adequate knowledge of our fauna and flora has been accumulated from this point of view, we may perhaps be able to derive some intelligent satisfaction from the contemplation of their Geographical Distribution.

Fisheries Office, Dublin.

# RARE PLANTS OF THE CO. DOWN COAST.

BY REV. C. H. WADDELL, M.R.I.A.

It may be interesting to put on record some localities for a few plants collected in July of this year, two of which are additions to our county list.

**Draba muralis** L.—This plant, which was seen in 1896 by Canon Lett on a wall of the Newry nursery, has spread from the walls and become a troublesome weed, covering the ground in parts of the well-known Daisy Hill nursery on the Co. Armagh side of Newry.

**Brassica Rapa** var. **Briggsii** Wats.—Common in fields by the shore at Warrenpoint harbour and at Omeath, Co. Louth.

**Raphanus maritimus** Sm.—Omeath.

**Radiola linoides** Roth.—Ferry Hill, Co. Louth.

**Valerianella olitoria** Poll.—Walls at Narrow-water, on both sides of the river.

**Tragopogon porrifolius** L.—The Salsify is well established on the banks of the river north of Warrenpoint.

***Lactuca muralis** Gaertn.—I found a number of plants of Wild Lettuce growing on the wall and in the open part of the wood by the roadside between Rostrevor and the Woodhouse. This is an interesting extension of range for this species which has not been found before in Ulster, the nearest station being Collon, Co. Louth.

**Linaria repens** Mill.—This beautiful plant is still abundant at Killowen, especially on walls and banks by the sea.

**Scrophularia aquatica** L.—Seems to be spreading about Warrenpoint, where some plants are growing on the sea wall. I found it also at Narrow-water, on the roadside between the ferry and Milltown.

**Mimulus Langsdorffii** Donn.—This beautiful immigrant has established itself on the shore at the mouth of the Moygannon River, where it is accompanied by *Atriplex portulacoides*. It is also found further up the river.

**Stachys arvensis** L.—A weed in fields at Omeath

**Briza media** L.—Sea banks north of Warrenpoint.

***Zostera marina** L. var. **angustifolia** Hornem.—The common Grass-wrack and its narrow-leaved variety (*angustifolia*) grow in great masses on the mud banks in Strangford Lough near Grey Abbey, where they provide food for flocks of Brent Geese (called "Bernacles" in this locality). These pluck up and eat the succulent stems. The leaves float ashore, and this "sleech," as it is called, forms a valuable covering for potato bins in winter, but is of little use for manure, it takes so long to decay.

***Z. nana** Roth.—The Dwarf Sea-grass has not been found hitherto in Co. Down. I was glad therefore to find it growing with *Ruppia maritima* L. on muddy sand in pools between the Mid Island, Grey Abbey, and the mainland. It was not in flower, but the leaves cannot easily be mistaken. It is covered by 2 or 3 feet of water at high tide.

Greyabbey, Co. Down.

# IRISH SOCIETIES.

## ROYAL ZOOLOGICAL SOCIETY.

NOVEMBER 29.—A public lecture was delivered in the Royal Dublin Society's Theatre (by permission of the Council), by Prof. J. ARTHUR THOMSON, LL.D., of Aberdeen, who took for his subject "The Beauty of Animal Life," analysing the conception of beauty as appreciated by the naturalist, and illustrating his remarks by an admirable series of lantern slides. Sir Walter Boyd presided, and the theatre was crowded.

Recent gifts include a Red-eared Waxbill from Major Douglas, and a Cockatoo from Lady Errington. A female Woolly Monkey and a Mandrill have been received on deposit; a Hamadryas and a Yellow Baboon have been purchased. Four Lion-cubs have been born in the Roberts House, "Conn" and "Maive" being the parents.

## DUBLIN MICROSCOPICAL CLUB.

OCTOBER 11.—The Club met at Leinster House. N. COLGAN, M.R.I.A., was elected President and took the chair, W. F. GUNN being appointed Vice-President.

H. A. LAFFERTY exhibited microscopic preparations of and pure cultures of a fungus which he had obtained from wheat ears. The fungus was identified as *Gibberella Saubinetii* (Mont.) Sacc.; a species described as parasitic on various hosts in America and on the Continent, but hitherto not recorded from Ireland.

NOVEMBER 8—The Club met at Leinster House, the President in the chair.

H. A. LAFFERTY exhibited a specimen of Ash on which was present the fruiting bodies of the common wood destroying fungus *Polyporus squamosus*. Microscopic preparations of wood infested with the mycelium of this fungus were also shown, which clearly demonstrated its enzymic action on the cellulose, especially in the region of the spring wood.

W. F. GUNN showed two slides of the myxomycete *Trichia affinis* De Bary, obtained at Killakee in October. One of these showed the ripe sporangia as opaque objects, and the other the elaters and spores in a transparent mount. The species is said to be common on rotting logs, and has been recorded from Leinster and Munster but not from the other

Irish provinces. The sporangia walls are evanescent and easily rupture, liberating the crowded yellow spores which are marked by pitted shallow bands forming a triangular recticulation on the exterior surface.

## BELFAST NATURALISTS' FIELD CLUB.

October 24.—Annual Conversazione.—The Winter session opened with a conversazione held in the Carlton Hall, at which about 250 members and friends were present. Members contributed the following exhibits :—Geology—Minerals from Co. Antrim, Robert Bell ; core of Permian conglomerate, R. May ; fossils from Bundoran and Hillsport, A. M'I. Cleland ; specimens illustrating the growth of coal, A. M'I. Cleland ; fossil and recent Foraminfera viewed with the microscope, Joseph Wright ; models of Inishowen and Belfast districts, J. K. Charlesworth ; models made from maps by pupils of Richmond Lodge, Miss Houston. Botanical Specimens—Prof. R. H. Yapp, N. Carrothers, Rev. W. R. Megaw, A. W. Stelfox, Sylvanus Wear, Miss S. Blackwood, J. R. H. Greeves, H. C. Baker, S. A. Bennett, and James Orr. Zoological Exhibits—Nevin Foster, E. Foster Green, S. Stendall, R. A. Phillips, A. W. Stelfox, and Miss M. W. Rea. Archæological Exhibits—Wm. Gray, Miss Maudsley, Mrs. A. M'I. Cleland, Miss S. Blackwood, W. A. Green, and R. May. Miscellaneous Exhibits—W. A. Green, photographs of the linen industry ; S. Stendall, kinematograph film, " Life of the Spider."

After tea the Vice-President (Joseph Maxwell) took the chair, in the absence of the President (Captain A. R. Dwerryhouse) at the seat of war. In the course of his remarks the Vice-President said that among those present were two of the original members of the Club. Evidently natural history pursuits did not necessarily shorten life. Indeed, they were the best antidote possible to the troublous times through we were passing. Even at the front some enthusiasts found opportunities of pursuing their favourite studies. At this stage the following prizes were presented to members of the junior section by the Chairman :—Botanical Enigma Prize, 1915-16, John Dean ; Zoological Enigma Prize, 1915-16, Miss Nora Humphreys ; Botanical Enigma Prize, 1916-17, Miss Dorothy Armstrong ; Zoological Enigma Prize, 1916-17, Alfred George. Mr. Maxwell concluded his remarks by announcing that Alderman S. T. Mercier, J.P., Chairman of the Library and Technical Instruction Committee, Belfast Corporation, had offered two prizes to the boy and girl who had the best kept notebooks at the end of the forthcoming Winter Session. One ordinary and five Associate members were then elected. The remainder of the evening was taken up by an exhibition of kinematograph films dealing with natural history subjects, the lantern being manipulated with his usual ability by Alexander R. Hogg. A few photographs taken on some of the club excursions were also shown.

November 21.—Alex. M'I. Cleland gave a lecture on " The Roman Engineer : 50 B.C.—200 A.D.—the Vice-President (Joseph Maxwell)

occupying the chair. The paper was illustrated by a series of excellent lantern views, many of them from the lecturer's own negatives. Afterwards Dr. Charlesworth and N. H. Foster made a few remarks, to which Mr. Cleland replied. With the election of five junior Members the proceedings terminated.

## DUBLIN NATURALISTS' FIELD CLUB.

October 14.—Excursion to Kilruddery.—A party of twenty-five left Harcourt Street Station at 11.45 a.m. for Bray, arrving at Kilruddery about one o'clock. The day was very stormy. In the wood on the right of the avenue leading from the main gate, the conductor, Prof. A. Henry, pointed out the numerous natural seedlings of various ages of the Silver Fir (*Abies pectinata*) scattered about in the vicinity of the old parent trees. In the absence of rabbits, this species sows itself in most parts of Ireland almost as freely as the Ash and Sycamore. The fine old hedges of Beech, Yew, Lime, and Evergreen Oak were much admired. In a sheltered spot, some rare New Zealand trees were planted about ten years ago, the most remarkable being the Kauri pine (*Agathis australis*), of which only another specimen (at Menahilly in Cornwall) is known to exist in the open air in the British Isles. Splendid old trees of Lime and Beech are plentiful in the pleasure grounds; and the magnificent line of Evergreen Oak (*Quercus Ilex*), numbering about twenty trees, is unrivalled in Ireland, some of the stems girthing 10 to 12 feet. Special attention was paid to the distinguishing characters of the various species of conifers, such as *Pinus insignis* (splendid specimen), *Pinus excelsa*, Deodar, Larch, *Abies nobilis*. The party returned to Bray about five o'clock.

November 30.—The opening meeting of the Winter Session was held at the Royal Irish Academy House. The President (Prof. G. H. Carpenter) gave an illustrated address entitled "Useful Studies for Field Naturalists," which was discussed by N. Colgan, R. Ll. Prager, and C. Dunlop. It will be published in next month's issue of this magazine.

## CORK NATURALISTS' FIELD CLUB.

July 1.—Excursion to Waterloo.—A party of twelve members travelled by 3.30 p.m. train from Glanmire to Blarney, from which they walked to Ballygibbon rath. Here the conductor, J. Noonan, drew attention to the fact that in southern districts the Whortle-berry (*Vaccinium Myrtillus*) is generally found growing on all the so-called "Danish raths," except on those erected where the soil is calcareous. "Father Horgan's Round Tower" at Waterloo (erected in 1834 as a protest against Henry O'Brien's theory of the origin of the Round Towers, then recently published), was next visited. The party then proceeded to Blarney by the picturesque Ardamadane Glen. Tea was obtained at the Blarney Castle Café, after which the members returned to town by

the Muskerry Railway. In addition to its botanical interest the district traversed has many historic and literary associations, which were explained by the conductor.

JULY 12.—EXCURSION TO BISHOPSTOWN.—The members walked from Bishopstown station to Bishopstown House to visit the site of the eighteenth century residence of the Bishop of Cork. The small chapel, "Shell House," remains of old fish ponds, mineral springs, etc., were shown by Mr. E. Neville. Returning to the city by "Kate Seha's Lane," a fine glacial deposit was examined. West of it is a magnesian limestone quarry. By the wayside, east of the Munster Institute, the Hop (*Humulus Lupulus*) was found well established. This plant is gradually spreading south-west of the city.

AUGUST 2.—EXCURSION TO CARRIGROHANE.—On this outing M. Holland conducted the party of members who travelled out by the Muskerry Railway. The growth of *Centranthus ruber* on the face of the limestone cliff at the station is very conspicuous. *Orobanche Hederae* was found at the foot of the cliff. After visiting the castle on the top of the cliff, from which a fine view of the Lee valley was obtained, the members walked by the Church Cross and Inchigaggin Lane to Leemount station where tea was provided. Among the plants noted were :—*Ononis repens, Tanacetum vulgare, Linaria vulgaris.* In the first decades of the last century the Pearl-mussel, *Unio margaritifera* was found in abundance in the River Lee at Carrigrohane.

AUGUST 30.—VISIT TO THE MUNSTER INSTITUTE.—A party of twenty-six members and friends assembled at 3.30 p.m. at Victoria Cross, and walked to the Institute by Jennings's Lane. *Erinus alpinus* was found growing on a wall in the lane. This plant has spread considerably near Cork since the Rev. T. Allin recorded it for Douglas in 1883. On arriving at the Institute the party was received by the Lady Superintendent, Miss L. Murphy and the members of the staff, and shown over the building, the gardens, dairy, poultry runs, etc. The visitors were subsequently entertained at tea, after which a vote of thanks to Miss Murphy and the staff was passed.

SEPTEMBER 9.—EXCURSION TO BLACKROCK.—A party of twenty travelled by tram to Blackrock, and walked by the Church Road to Besborough, which was visited by permission of the Misses Pike. John Griffin acted as conductor. Vervain (*Verbena officinalis*) was one of the plants observed on the way. Within the grounds fir-cones bearing the characteristic markings left by squirrels were met with. A very luxurious growth of Mistletoe was observable on many trees in the gardens, where *Erinus alpinus* and *Orobanche Hederae* were also noted. Leaving Besborough and proceeding towards Lakelands, *Geranium striatum* was found. The following plants were found in the immediate neighbourhood of the River Lee :—*Suaeda maritima, Beta maritima, Anthemis Cotula, Statice Bahusiensis, Salicornia herbacea,*

# NOTES.

## BOTANY.

### Hypopithys multiflora in Co. Leitrim.

In October last my wife found several fruiting specimens of this rare plant growing in chinks of limestone rock under hazel scrub at the east end of Lough Gill, on the steep southern side of the knoll near Sriff Cottage, marked 328 on the one-inch Ordnance map. The plant is new to Leitrim, but has been thrice found at the western end of Lough Gill, in Co. Sligo :—at Hazlewood in 1871 (Miss Wynne) ; one plant at Doonee Road, 1896 (N. Colgan) ; and one plant at the latter station in 1904, found by myself during the Sligo Field Club Conference.

R. Lloyd Praeger.

Dublin.

### Pterogonium gracile Swartz in Co. Down.

Canon Lett and I found this moss growing sparingly on rocks and tree bases in two places on the mountain above Rostrevor not far from the " Big Stone" last July. The species is rare in the North of Ireland and is a welcome addition to the county flora.

C. H. Waddell.

Grey Abbey, Co. Down.

### Naias flexilis in Donegal.

Canon Bullock-Webster's modesty has buried a very important record of one of our most interesting flowering plants among the notes on Donegal Characeae which he contributes to the present number, and I draw attention to it here for fear that the record may be overlooked. First known in the British Islands from Cregduff Lough near Roundstone, Connemara, *Naias flexilis* was subsequently found at Killarney by A. G. More, and is now recorded from that third stronghold of our western flora, Donegal. In Great Britain it is known only from Skye and Perthshire, and in Continental Europe has a sparse northern distribution. Canon Bullock-Webster's discovery furnishes the most interesting addition to the Donegal flora which has been made for many years.

R. Lloyd Praeger.

Dublin.

### Filago minima at Howth.

I found *Filago minima* last July at Shielmartin Hill, Howth. The plant is very rare in Co. Dublin as, so far as I can trace, it does not appear to have been previously recorded as occurring in the Howth district.

D. B. Bradshaw,

Dublin.

## ZOOLOGY.

### Anosia archippus in Co. Cork.

In the *Irish Times* of November 7th, 1916, H. Chavasse records the capture of a specimen of the famous North American "Milkweed Butterfly" near Skibbereen on October 20th. It is well known as a migratory insect, and might have been expected in Ireland before now, as nearly thirty examples have been observed in the south and west of England.

### Quail on Migration at Rockabill Light-Station.

On Thursday, September 28th, 1916, at 9.30 a.m., Mr. Hammond principal keeper, picked up a dead Quail on the roof of the oil-store which encircles the base of the tower. Beside it lay a Greater Whitethroat. Both birds, as he handed them to me, were very fresh but soaking wet; when I dried the Quail I found it was an adult male in splendid plumage.

C. J. Patten.

University, Sheffield.

### Short-Eared Owl on Migration at Rockabill Light-Station.

In the October number of the *Irish Naturalist* (vol. xxv., p. 170) I mentioned that at 7.20 p.m. I observed an owl (Short-eared to the best of my belief) flying round Rockabill. The date of my observation, which was August 20th, 1916, appears to have been accidentally omitted.

C. J. Patten.

University, Sheffield.

### Swans and their Nests.

A couple of swans frequent our little lake (or rather pond) of about 3 acres. They fly to the open waters of the Boyne in hard weather, come and go at will, but always nest here. However, they have never succeeded in rearing their young. In 1914 and 1915 the young ones died at the age of two or three weeks. Mere bags of fluff they were, and seemed starved. This year the eggs were addled and did not hatch out at all. I am at a loss to guess the reason, and would be glad of any suggestion. I questioned the man who feeds the wild fowl at the Zoo

in Dublin who told me that the swans there very rarely rear their young successfully. He attributed this to cold and wet seasons, but I doubt this, because at Beaulieu Pond, which is very like mine, but larger, the swans rarely fail to rear their broods. Moreover, when I was a boy, they bred here very successfully. He also told me the cygnets lived on small flies and insects which they caught on the water. If so, I don't wonder they died of starvation. Surely the parents feed them?

G. H. Pentland.

Black Hall, Drogheda.

## Recent Notices of Irish Birds.

Alfred Bell brings together the records of Pleistocene and later bird remains from the British Isles, including cave, sand-dune, and crannog records.—(*Zool.*, 1915, p. 401.)

C. J. Patten records (*Ibid.*, 1916, p. 41) an Icterine Warbler on migration from Tuskar Rock (with plate).

J. M. M'William notes (*Zool.*, 1916, p. 194) a Bartram's Sandpiper from Bunduff, Co. Leitrim, and contributes a paper (*Ibid.*, 1916, p. 348), "Notes on some Irish Birds," dealing mostly with Co. Monaghan.

R. F. Ruttledge writes (*Ibid.*, 1916, p. 431) on birds of South Mayo, largely Lough Carra.

N. H. Foster records (*Brit. Birds*, ix., p. 119) the Tree-sparrow breeding on a cliff in north Antrim.

W. J. Williams announces (*Ibid.*, ix., p. 125) the taking of a young Black-necked Grebe, too immature to fly, from a western lake.

A. R. Nichols states (*Ibid.*, ix., p. 253) that the Little Shearwater obtained in Ireland in 1853 proves on examination to be the Madeiran Little Shearwater.

C. J. Carroll writes on the extermination of the Golden Eagle in Ireland (*Ibid.*, ix., p. 251), Common Buzzard in Wicklow (ix., p. 252), cream-coloured Whimbrel on Lough Mask (ix., p. 255), increase of Tufted Ducks in Tipperary (ix., p. 275), Common Guillemots breeding in Waterford (ix., p. 276), Siskin colony in Tipperary (ix., p. 293), Green Sandpipers in Tipperary (ix., p. 302), Quails in Tipperary and Waterford (ix., p. 302).

Rev. C. W. Benson records February Chiffchaffs from Dublin and Wicklow (*Ibid.*, ix., p. 319), and has a note on Quails in Dublin (ix., p. 320).

J. Cunningham notes (*Ibid.*, x., p. 116) some Crossbills near Belfast.

## Speed of flight of Leisler's Bat.

My son told me this summer that he had seen some large bats hawking about the little lake in my grounds and that they flew very fast, faster, he thought, than a Swift which was with them. Our common bat here is the little Pipistrelle, and any larger bat is very seldom to be seen, so I went down the next evening to verify his statements and found it was quite accurate. From two to five large bats haunted the lake and the adjacent woods for most of the fine weather. They appeared about ten

minutes before sundown and remained as long as I could see them. They flew high as a rule and with astounding speed. I saw them in company with Swifts several times, and they certainly flew faster than the swifts. When they twisted and turned and swooped after their prey I could not follow their movements. My son shot one of them (no easy feat), and it turned out to be the Hairy-armed, or Leisler's Bat, which is, I believe, the largest bat we have in Ireland. It is perhaps worthy of note that I never heard these bats utter a sound, though they are said to be very noisy on the wing. Of course the occurrence of this bat here is in no way remarkable, but I want to call attention to the extraordinary speed of its flight. The Pipistrelle, so far as I can judge, does not fly nearly so fast as a Swallow.

G. H. Pentland.

Black Hall, Drogheda.

## Badgers and Hedgehogs.

About fifteen years ago Badgers appeared in my woods and soon formed a flourishing colony. As they increased, the Hedgehogs, which were then very plentiful gradually disappeared. For five or six years I never saw one at all. Then something happened to the Badgers. Their numbers dwindled till the tribe was reduced to one or two and they seem on the verge of extinction and the little Hedgehogs are reappearing! Cause and effect evidently.

G. H. Pentland.

Black Hall, Drogheda.

## Boldness of a Stoat.

A few days ago, one of the ladies of my family saw a Stoat which had just killed a full-grown Rabbit, and was eating it. She sat down to watch it. At first, being intent on its meal, it did not perceive her, but presently it looked up, saw her and retired into a rabbit hole. She sat still and watched. It came out again, looked at her and disappeared again. She still waited. Presently she was startled by a shrill cry at her back, and turning saw the Stoat at the mouth of a hole about two feet from her. It snarled and squeaked at her. She picked up a stick and made a thrust at the Stoat which retreated for a moment, but reappeared again at once, defying the stick and offering such an angry and menacing appearance that she fairly dropped her stick and ran away, leaving the gallant Stoat master of the field and the rabbit. Stoats have increased in numbers here lately to my great pleasure. There is no more useful creature (outside the poultry yard).

G. H. Pentland.

Black Hall, Drogheda.

# ARBUTI CORONA.

"All authorities appear to be in agreement as to the great antiquity of both these groups [the Lusitanian and American species of the Irish flora]. Prof. Forbes, indeed, considered that the Lusitanian was the oldest element in our present flora. It probably reached Kerry along a coast-line which was continuous from Spain to Ireland."—R. W. SCULLY: "Flora of Kerry," p. xl., 1916.

"The three southern sub-floras of Forbes [including the Lusitanian], in place of being the oldest as he supposed, we now know must have been the most recent; and it is now very doubtful to what extent they migrated over continental land now submerged, as he supposed, or were not rather carried by birds, currents, and other natural agencies."—Prof. W. H. HERDMAN: "Life and Work of Edward Forbes," in *Proc. and Trans. Liverpool Biol. Soc.*, vol. xxx., p. 72, 1915-16.

The County of Kerry is, as Mr. Southern has very properly remarked in the last number of this Journal, the Mecca of the student of geographical distribution in Ireland; and its biological interest centres on the group of Pyrenean plants and animals for which that area is famous. I was under the impression that, excepting the vigorous opinions of the late Mr. Clement Reid—whose recent death Irish naturalists join with their English brethren in deploring—a fair amount of unanimity had been reached as to the great relative age of these organisms as immigrants to Ireland; but two passages, recently written, which are quoted above, show that the lion is not yet prepared to lie down with the lamb. One cannot but feel surprise at the confidence with which Prof. Herdman announces that "we now know" that the Lusitanian plants are among the most recent arrivals in the country, and one wonders who is included in the "we" —certainly not one of the Irish biologists who have made a special study of this group and of the question of its origin. One of the many interesting features of Dr. Scully's recently issued "Flora of Kerry"[1] is his conclusions regarding many of these plants, which he has

[1] "Flora of County Kerry, including the Flowering Plants, Ferns, Characeae, &c." By REGINALD W. SCULLY, F.L.S. With six plates and a map. Dublin: Hodges, Figgis & Co., Ltd. 1916. 8vo. pp. lxxxii + 406. 12s. 6d. net.

been studying in their native surroundings for a period of twenty-five years.

A remarkable point in Mr. Clement Reid's confession of faith regarding the origin of the British flora is his conviction that the Lusitanian element is rapidly enlarging the area of its colonies. "I have mapped and examined a good many of these areas, and the plants seem in most places to be spreading vigorously from certain definite centres, to which chance has imported a seed" (see *Irish Naturalist*, xx., 207). Dr. Scully's conclusions, drawn from twenty-five years' observations of the Pyrenean group in Kerry, is directly opposed to this idea. *Arbutus Unedo* is certainly, and *Saxifraga Geum* probably, on the decrease, according to him. Furthermore, he has had certain colonies of both Pyrenean and American plants under continuous observation, and finds no tendency in a quarter of a century to increase either in numbers or in area. It is interesting to note that this observation extends to *Sisyrinchium angustifolium* and *Juncus tenuis*, two plants whose claim as natives has often been doubted, and for which a rapid increase in recent times has been frequently suggested: Dr. Scully considers both of them aboriginal, and stable as regards their range. This contribution to our knowledge of the status of our western plants will be warmly welcomed.

Another important feature of Dr. Scully's book is his discussion of the Robertsonian Saxifrages—*S. umbrosa*, *S. Geum*, and the rather shadowy *S. hirsuta*. By means of a series of cultivation experiments, both synthetic and analytic, carried out at Trinity College Botanic Garden by Prof. H. H. Dixon, it has been shown for the first time definitely that *S. hirsuta*, as well as a number of other named and unnamed intermediate forms, is an *umbrosa-Geum* cross; I say, "for the first time definitely," because I fancy that few botanists who have had experience of these forms in the garden, or who have studied them in their habitats, have had any reason to doubt the hybrid pedigree of *S. hirsuta* and its kindred forms. My own experiences, for instance, are probably analogous to those of other people who have paid any attention to the group.

I brought *S. Geum* from Berehaven to Belfast in 1888, and grew it in my garden for five years. Numerous self-sown seedlings appeared, all of which agreed with the parent. In 1894 I brought *S. umbrosa* from Recess to my Dublin garden, where for ten years it grew and produced only normal seedlings. Then I received *S. Geum* from Kerry, and planted it near the other. The most varied seedlings soon began to appear, representing many stages intermediate between the two species, and including *S. hirsuta.* This kind of evidence is good enough in its way, but it does not supply a scientific proof; and as I think that most other botanists had got no further in the matter than I had, the results of Dr. Dixon's definite and controlled experiments are important. Incidentally, I may say that an account by the experimenter himself, with further information of this research, would have been welcome, and, combined with Dr. Scully's systematic notes, would have been appropriate to the pages of one of our botanical periodicals, where besides it would have obtained a wider publicity. Dr. Scully's long discussion of these forms, and the accompanying six plates of leaf forms (which are rather poor) while most interesting, appear somehow inappropriate in a county Flora, and mar the methodical harmony of the work.

We look to the publication of a local Flora, and the intensive study of the plants of the selected area which it involves, to settle outstanding doubts and difficulties regarding the occurrence or rank of certain species, and similar points regarding which there may have been obscurity. In this respect the "Flora of Kerry" fully maintains its author's reputation for painstaking research and sound judgment. Some of his decisions regarding the standing of plants in Kerry are decidedly interesting. Among species often looked on with suspicion, which he admits to full rank as natives, are *Teesdalia nudicaulis* (on the strength of one small patch now apparently extinct), *Lavatera arborea, Trifolium filiforme, Sambucus nigra.* Dr. Moss, editor of the "Cambridge British Flora," recently told me that, having examined the only English station (near Bournemouth)

of *Simethis bicolor*, he believed, as H. C. Watson did before him, that the plant is not native there. Dr. Scully has no doubt about its being native in Kerry, and botanists who have examined its Irish habitat will be inclined to agree with him. *Thalictrum alpinum* is included in the flora, although the Brandon record, now thirty years old, has never been confirmed, despite the numerous visits of botanists to that glorious place. Another plant which is admitted, concerning which I cannot but feel very sceptical, is *Elisma natans*. The record rests on immature plants collected by G. C. Druce in 1885 near Muckross. Mr. Druce's record (*Irish Naturalist*, xix., 237) states that Prof. Glück, the well-known authority on water-plants, unhesitatingly referred the specimens to *E. natans*. But Prof. Glück's account of the matter, as I have already had occasion to remark (*Irish Naturalist*, xxi., 105), is of a different complexion. As a matter of fact, his statement to me was a good deal stronger than what I published, and makes it quite impossible to include this plant in the Irish flora on the present evidence. A few plants which we are accustomed to look on as indigenous in most of their Irish stations are set down by Dr. Scully as introduced in Kerry —*Spergularia rubra*, "alien," for instance, and *Ononis repens*, "denizen." *Armeria alpina* is excluded, as being doubtfully British; and the evidence, though recent, is not considered sufficient to justify the inclusion in the Kerry flora of *Cardamine amara*, *Orchis Morio*, *Juncus trifidus*. The Kerry "discoveries" of the notorious W. Andrews, such as *Herniaria glabra* and *Saxifraga Andrewsii*, are treated as they deserve to be. The puzzling *Polygonum sagittatum* is set down as "alien or denizen." I feel no doubt that all these decisions will commend themselves to students of the Kerry flora.

The treatment of the critical genera is somewhat unequal. The accounts of Rosa, Hieracium, and Potamogeton are particularly full and clear, and indicate industrious and critical collecting and careful diagonsis. Rubus, Euphrasia, Chara, etc., are not awarded such full treatment, and have evidently received less attention in the field. The accounts relating to certain special plants are delightfully

good ; of Arbutus, for example, and *Polygonum sagittatum,* and particularly of *Saxifraga umbrosa* and *S. Geum,* as already mentioned. The more technical information is enlivened with quaint and well chosen extracts from the older writers on the Kerry flora, and the author's love of nature and of beauty often shines through his account of the plants and their habitats. Who will quarrel with him for regarding *Pinguicula grandiflora* as the most beautiful member of the Irish flora ?

At the same time one cannot help thinking that the book is a little bit—dare we use the word ?—old-fashioned in its treatment of the flora in its wider sense. The description of the topography of the county—so intimately associated with its vegetation—is somewhat mechanical. Only slight attempts are made to look at the vegetation or its constituent parts from the point of view of plant geography or ecology. The subject of regional floras is but weakly developed. No discussion is supplied, for instance, of the flora of any of the islands lying off the Kerry coast—not even of the Blaskets, which are of peculiar interest as forming the most westerly land in Europe ; yet the flora of at least the main island of the group is thoroughly known and presents interesting features. Neither does one find any account of the vegetation of the fascinating native woods which are so marked a feature of many of the Kerry valleys, and which at Killarney are of such special importance. But nevertheless the topographical part of the book is better done than in the case of many local floras of recent date. The map which—excepting the inartistic but useful plates of Saxifrage leaf-forms—forms the sole illustration in the volume is small and inadequate, and a large number of the places mentioned in the text are not entered upon it. The inclusion of an orographical and a geological map would have greatly assisted the reader in understanding the features and problems of Kerry botany.

The point which comes out clearest from a study of the distribution of the Kerry plants strikes me as being the extraordinary richness and intricacy of the flora of Killarney. Here favourable and varied conditions prevail

—there is in a limited area mountain and lowland, rock and lake, limestone and slates, woods and streams. Again, large houses and gardens are frequent, and the introduced flora is varied; flower-beds adjoin wild rocky ground with a startling proximity; many of the garden plants have now run riot; and so the present Killarney flora presents a bewildering tangle of native and alien plants. One would like to know the number of species found within half-a-mile of the Lower Lake; it must be, for Ireland, a remarkable total.

From omissions or errors of any kind the book is almost free. One misses the name of West Galway from the note on *Bartsia viscosa*, which is described as disappearing completely between Kerry and Donegal. "Topog. Bot." does not strike one as a happy contraction for "Irish Topographical Botany," since by any but a Hibernian reader it would be confused with Watson's better known work. Nor do "Bien." for biennial, and "Peren." for perennial appeal to one. Mr. Marshall's Ranunculus is referred to as *R. petiolaris*, though that name, being already occupied, was soon discarded in favour of *R. scoticus*.

The author tells us that he has taken Mr. Colgan's "Flora of the County Dublin" as a model, and so closely has he followed his pattern, as regards not only arrangement but paper and type, that when both works are open before one it is impossible to distinguish them except by the context. The "Flora of Kerry" is beautifully printed on thick paper, but typographical errors are rather more frequent than one would expect in a work so carefully prepared and sumptuously produced. Though dealing with only one county, it is more bulky than any of the works dealing with the flora of the whole of Ireland—a distinct disadvantage for the scientific tourist who wishes to carry it with him on his peregrinations. A thin-paper edition reduced in size so as to allow of its being carried in the pocket would be a godsend to the field botanist.

The appearance of this able and full account of the distribution of the higher plants in Kerry—the most beautiful and most interesting of all the Irish counties—will be welcomed everywhere by botanists. It is fit and

proper that Kerry plants should have a volume to themselves, and in Dr. Scully's book they find certainly a noble shrine.

R. LL. P.

## EARTHQUAKE OR LANDSLIP?

BY R. F. SCHARFF, PH.D., M.R.I.A.

Bog-slides as well as land-slips near the coast have been observed in Ireland, but I am not aware of slow movements of the soil having ever been noticed or recorded in Ireland. The curious phenomenon that I wish to bring under the notice of the readers of the *Irish Naturalist* may not be due to this cause. It may possibly be due to a local earthquake, but it seems to me more probably the result of a land-slip.

Heavy rains had been falling during October followed by another severe rainfall on the 3rd November last. On the night of the latter date two of my clocks suddenly stopped at ten minutes to eleven, while three other clocks went on as before. The latter are placed with the pendulum swinging in the direction from north to south, whereas the two which stopped are fixed in the direction west to east. My house, I may mention, is built on the slope of Carrigoona Mountain in Co. Wicklow. It stands on a concrete foundation which rests on about 20-30 feet of boulder clay and sand. Underneath this comes the quartzite rock of this district.

The clocks had both been keeping excellent time. Besides the fact of their both stopping at precisely the same time indicates that the stoppage was produced by the same cause, which could only have been a shaking of the house in the direction of the slope of the ground, which is eastward. No indications, other than that alluded to, were noticeable to prove that such had been the case. I assumed, nevertheless, that a landslip had taken place. I should be glad to hear any observations on the subject from anyone interested in the matter.

Knockranny, Bray.

# ADDITIONAL COLEOPTERA FROM MEATH AND CAVAN.

BY G. W. NICHOLSON, M.A., M.D.

TEMPTED by the fine weather of the latter part of May, I went to Ireland in June, 1916, hoping to do some summer collecting. I could hardly have chosen a worse month, and very soon gave up sweeping and similar summer amusements, and had to content myself with grubbing. In spite of this I did well enough to justify the belief that there are still many surprises in store for the collector in the less well explored parts of Ireland.

## I.—COLEOPTERA FROM BALRATH, CO. MEATH.

The following are additions to the Irish list :

1. *Omalium planum*, Pk. One specimen at the sap of a recently injured oak in the deer-park on June 5.

2. *Conosoma immaculatum*, Steph. One in moss on the bog on June 10.

3. *Neuraphes Sparshalli*, Den. One under the bark of a dead log on the bog on June 10. The other side of this log was occupied by a nest of *Lasius fuscus*. There were, however, no specimens of the ant in the company of the beetle, nor was I able to find any more of it by sifting the nest.

4. *Scymnus nigrinus*, Kug. Two specimens by beating a fir in the bog wood on June 3.

5. *Crepidodera smaragdina*, Foud. This is a doubtful species, and is, in my opinion, merely a variety of *C. helxines*, L. I took numerous specimens, which agree with such British examples of *C. smaragdina* as I have compared them with. No other form of Crepidodera was found with them. They were taken off sallows on the bog on several days.

6. *Otiorrhynchus porcatus*, Hbst. This interesting addition to the British list, which I have already published elsewhere,[1] came as a great surprise. I found one very bedraggled specimen in a shower of rain on the hall steps on June 2, and 12 more on the bog on the 10th, where they were shaken out of moss in a very restricted area.

In addition I may mention the following captures: *Pterostichus versicolor*, Stm., the second black specimen in this locality; *Megarthrus denticollis*, Beck., in moss on Chamberlaynestown bog; *Olophrum fuscum*, Gr., one in a swamp; *Stenus lustrator*, Er., a few with the preceding; *Lathrobium quadratum*, Pk., one at the edge of a pond; *Lamprinus saginatus*, Gr., one on Chamberlaynestown bog, and two on the home bog out of moss in company with a species of Myrmica; *Encephalus complicans*, West., by sweeping in a ditch; *Bolitochara obliqua*, Er., under pine-bark; *Ilyobates nigricollis*, Pk., one specimen in moss on the bog; *Euplectus ambiguus*, Reich., in sedge refuse; *Neuraphes angulatus*, Muell., two specimens in moss; *Colon brunneum*, Lat., one in sedge refuse; *Agathidium marginatum*, Stm., two with the preceding; *Orthoperus atomus* Gyll., at the sap of a wounded oak; *Cercus pedicularius*, common on reeds, etc.; *Epuraea obsoleta*, F., *E. longula*, Er., *E. florea*, Er., on a wounded oak, the former exceedingly common; *Ips iv-punctata*, Hbst., this species, which I added to the Irish list a few years ago on the strength of one specimen from the bog wood,[2] was not uncommon under the bark of a pine stump in the same place; *Pityophagus ferrugineus*, F., five under the bark of a felled pine; *Atomaria analis*, Er., in moss; *Hyperaspis reppensis*, Hbst., one swept on the bog; *Sericosomus brunneus*, L., together with the var. *fugax*, F., which is the female of this species, very sparingly by beating young fir trees in the bog wood; *Elater pomorum*, Hbst., equally common under the bark of birch and of pine stumps on the bog, also an occasional specimen on the wing and by general sweeping, etc.; *Rhinosimus ruficollis*, L., by sweeping;

[1] *Entomologist's Monthly Magazine*, lii., 1916, p. 202.
[2] *Irish Naturalist*, xxiii., 1914, p. 71.

*Anaspis rufilabris*, Gyll., on hawthorn flowers; *Dryophilus pusillus*, Gyll., which I have recently recorded from the Co. Cavan,[1] was not uncommon on larch in the bog wood; *Barypeithes sulcifrons*, Boh., one specimen on a buttercup; *Sitones brevicollis*, Sch., one by sweeping; *Barynotus elevatus*, Marsh., fairly common in moss and by sweeping on the bog; *Coeliodes quercus*, F., on oak; *Elleschus bipunctatus*, L., in profusion on sallows in the bog wood; *Apion immune*, Kirby, a few on broom.

A morning spent on the bog on my cousin's property of Emlagh, near Carlanstown, produced *Telephorus liturratus*, F.; *Elater pomorum*, Hbst.; *Barynotus Schoenherri*, Zett., under stones; *Orchestes scutellaris*, Gyll., var. *semirufus*, Gyll., very common on young birch, without, however, a single specimen of the type form being found; and *Pityophtorus pubescens*, Marsh.

## II.—Coleoptera from Cloverhill, Co. Cavan.

I spent a good deal of time in vain endeavours to run down *Pterostichus aterrimus*, Pk.; in doing so, however, I found six specimens of *Carabus clathratus*, L., by treading grass at the edge of a lake, and a single *Chlaenius holosericeus*, F., in a tuft of sedge in the same spot. The capture, in this locality, of the former species is rather surprising, as it is usually recorded from bogs at a high elevation or near the sea. It is generally taken in April. As one half of my specimens are males, and as they are all in excellent condition, I conclude that the species was by no means "over," but that it must be rare in the district, since I was unable to capture any more. *Stenolophus vespertinus*, Pz., one with the preceding; *Acupalpus luridus*, Dj., one in moss on a bog; *Anisodactylus binotatus*, F., var. *spuraticornis*, Dj., four specimens in turf refuse; *Agabus paludosus*, F.; *Stenus crassus*, Steph.; *Cryptobium glaberrimum*, Hbst., in moss; *Philonthus carbonarius*, Gyll., *Pilucens*, Er., in straw refuse; *Gyrophaena laevipennis*, Kr., by sweeping; *Tachyusa atra*, Gr., common on the muddy

[1] *Irish Naturalist*, xxiv., 1915, p. 5.

shore of a lake ; *Hypocyptus laeviusculus*, Man., by sweeping ; *Euplectus ambiguus*, Reich., *Tychus niger*, Pk., *Euconnus hirticollis*, Ill., in moss ; *Anisotoma ovalis*, Schm., by sweeping ; *Liodes humeralis*, Kug., one on a pine stump ; *Agathidium laevigatum*, Er., in straw refuse ; *Clambus punctulum*, Beck., one specimen of this recent addition to the Irish list [1] out of moss on a bog ; *Corylophus sub-laevipennis*, Duv., a few in some straw in a field ; *Hister neglectus*, Germ. ; *Octhebius pygmaeus*, F. ; *Chaetarthria seminulum*, Hbst. ; *Telephorus figuratus*, Man., together with the var. *scoticus*, Shp., which latter has not before been recorded from the country ; *Malthodes atomus*, Th. ; *Soronia punctatissima*, Ill., two at the sap of a damaged oak. This species is included in Johnson & Halbert's List of Beetles of Ireland,[2] without, however, any locality being given ; *Rhizophagus cribratus*, not uncommon under bark ; *Cryptophagus distinguendus*, Stm., one by sweeping ; *Antherophagus pallens*, Gyll. ; *Atomaria basalis*, Er. ; *Throscus dermestoides*, L., common under dead leaves ; *Tanysphyrus lemnae*, F., not uncommon in sedge at the edge of lakes ; *Phytobius comari*, Hbst. ; *Ceuthorrhynchus cochliariae*, Gyll., a few by sweeping ; *C. chalybaeus*, Germ., I swept one specimen of this species, that I recorded from Meath two years ago ; [3] *Orobites cyaneus*, L. ; *Pityophthorus pubescens*, Marsh.

At various spots on the shore of Lough Oughter I took *Bembidium assimile*, Gyll. ; *Chlaenius vestitus*, Pk. ; *Bledius subterraneus*, Er., in abundance.

At Castle Saunderson I found one specimen of *Donacia impressa*, Pk., on an Iris leaf by the shore of a lake.

At Lanesborough Lodge I observed *Atheta luteipes*, Er., under a stone by the river.

Oxford and Cambridge Club, London, S.W.

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[1] *Irish Naturalist*, xxii., 1913, p. 49.
[2] *Proc. Royal Irish Academy* (3), vi., 1900-1902 p. 710.
[3] *Irish Naturalist*, xxiii., 1914, p. 68.

# IRISH SOCIETIES.

## DUBLIN MICROSCOPICAL CLUB.

DECEMBER 13.—The Club met at Leinster House, N. COLGAN (President) in the chair.

W. F. GUNN showed two slides of the myxomycete *Arcyria punicea* Persoon, one showing the ruptured sporangia, and the other the capillitium threads and spores. The species has been recorded from six out of the twelve sub-provinces of Ireland.

Prof. G. H. CARPENTER showed the live pupa of a female snake-fly (Raphidia) brought from the New Forest, Hampshire, by Dr. Pethybridge, who had found it in old timber. This pupa is remarkable for its great activity and power of movement, resembling, more than other pupae of the Endopterygota, the nymph of a primitive insect. The characteristic ovipositor is closely apposed to the dorsal aspect of the abdomen, its tip directed forward.

Sir F. W. MOORE showed a parasitic fungus *Colletotrichum Orchidearum* Allesch., found growing on a species of Oberonia in the Orchid-houses at Glasnevin. The genus is closely allied to Gloeosporium, from which it differs in having peculiar dark bristle-like sterile conidiophores; these were seen in the specimens exhibited. This fungus has previously been found on orchids at Glasnevin, and in several continental Botanic Gardens. It is doubtful if it has been found on orchids in a wild state.

D. M'ARDLE showed specimens of *Eurhynchium rusciforme* Milde var. *inundatum* Bridel, which he recently found attached to stones in a mountain stream at Killakee, Co. Dublin. Specimens were sent to a well-known authority, Mr. H. N. Dixon, of Northampton, who writes: "The Killakee specimens come nearer to plants labelled var. *inundatum* than the var. *prolixum*." The latter has long been a desideratum in Ireland. Wilson in his excellent work, "Bryologia Britannica," p. 355, under *H. ruscifolium*, Dill, states: "In the Hookerian Herbarium there is a curious variety of this species, of a very different aspect from that of the typical form, from Laxlip [Leixlip], Ireland, with elongated cylindrical or filiform fasciculated branches, and smaller roundish, very concave leaves. It is without fruit, and deserves further investigation." The variety *inundatum*, though not previously published as an addition to the Irish cryptogamic flora, has been detected in one other county (Wicklow). He also showed type specimens in fruit, and as a microscopic object the capsule with the large lid and long curved beak removed, exposing the bright red-coloured teeth furnished with semilunar imbricated bands for about two-thirds of their length, terminating in fine hyaline points, highly hygroscopic; annulus almost rudimentary, spores mostly round with a well marked hyaline ring.

JANUARY 10.—The Club met at Leinster House, N. COLGAN (President) in the chair.

Prof. G. H. Carpenter showed stained sections through the seminal vesicles of an earthworm in which the stages in the conjugation and sporulation of the well-known sporozoan parasite Monocystis, as lately described by Cuénot, could be clearly demonstrated.

W. N. Allen exhibited a specimen of the myxomycete *Dictydiaethalium plumbeum*, Rost., one of three plasmodia found growing on a log in Dickson's Nursery, Newtownpark Avenue, Blackrock, Co. Dublin, on 22 November, 1916. The plasmodium shown was the largest of the three, and measured about one square centimetre; when found it was in the rose-coloured stage, and had completed its development when exhibited, being thus of a brownish slate colour. Accompanying the exhibit were coloured drawings of the plasmodium and of the spores, which measured from 6.35 $\mu$ to 12.7 $\mu$ in diameter, and contained when examined on 2nd December numerous globules which have since been disappearing.

D. M'Ardle showed specimens of *Amblystegium serpens*, var. *angustifolia* Lindb. (Limpr.) and a microscopical preparation of stem and leaves, and copious light yellow-coloured rhizoids. It differs from the type in the complete absence of a nerve, and the leaves more widely ovate-cordate at the base, forming a distinct auricle, tapering to a fine acumen, margin bluntly and distantly dentate or sinuolate, especially in the lower half. Cells large-ovate, unequal-sided, four times as long as broad, increasing in size upwards, the fine acumen formed of a single cell. The whole plant presents an unusual fragile structure, and forms an interesting microscopic object. The specimens were collected recently at Killakee on the Dublin Mountains on old wood, they are of a deep green colour, ½ to ¾ inch long, growing in neat strata. No fruit has been found; it will be searched for with the hope of finding more evidence to rank this beautiful distinct form as a species. The exhibitor is not aware of its being previously found in Ireland, and it is an addition to our cryptogamic flora.

# REVIEW.

## BRITISH PLANTS.

**Illustrations of the British Flora.** Drawn by W. H. Fitch, F.L.S., with additions by W. G. Smith, F.L.S. 4th revised edition. London: L. Reeve. 1916. 9*s*. net.

The new edition of this well-known work has been brought up to date by the inclusion of a few recent additions to the flora of our islands; and in place of the bare list of Natural Orders given in previous editions an enlarged version of the "Arrangement of Natural Orders" as given in the last edition of Bentham's "Handbook of the British Flora" is substituted, to assist the reader in running down his plant. In the body of the work the addition of certain synonyms and of the English names of the plants will also be a help to the reader.

# OBITUARY.

## GEORGE DUNLEAVY,

Of the many lightkeepers whose well-filled schedules formed the basis of Mr. Barrington's Irish Migration Reports, few contributed so much excellent work as George Dunleavy, who, we regret to see, passed away on the 3rd of January last, at his Islandmagee home, Ballylumford. Dunleavy was stationed at the Fastnet lighthouse in the years 1886-8, and from that station he sent Mr. Barrington the first Lapland Bunting known to have visited Ireland, as well as the third and fifth Irish examples of the Pied Flycatcher, three Black Redstarts, and a Common Redstart. After leaving the Fastnet he was in charge of less promising lighthouses—Spit Bank (1889-91), N. Drogheda (1892-3), Samphire Island (1894-5), and Dungarvan (1896-7), and had naturally fewer opportunities of sending rare birds; but his vigilances as an observer and his accuracy in noting what he saw made the poorest station a centre of ornithological interest when Dunleavy filled its schedules. His letters showed that he took real pleasure in the work. At the time of his death he had attained the age of 72.

C. B. M.

# NOTES.

## BOTANY.

### Trichia affinis in Connaught and Ulster.

In a report of a meeting of the Dublin Microscopical Club, p. 13 *ante*, it is stated that *Trichia affinis* de Bary has only been recorded from Leinster and Munster. Reference to Miss Lister's report on the Mycetozoa, Clare Island Survey (*Proc. R. I. Acad.*, vol. xxxi., part 63) shows that this species has been found in both Counties Galway and Mayo. In *Proc. Belfast Naturalists' Field Club*, series 2, vol. vii., pp. 86, 101 and 161-163, it is moreover recorded for Counties Antrim, Leitrim, Sligo and Fermanagh. I have also collected it in County Down, and found this species to be generally common.

MARGARITA D. STELFOX.

Ballymagee, Bangor, Co. Down.

### Elymus arenarius and Asparagus officinalis on the North Bull, Dublin.

On a visit paid to the North Bull on the 16th September last, my first visit since the Bull was closed to the public on its adoption as a military rifle range towards the close of 1914, I found four patches of this fine grass well established and in fruit along the outer or sea edge of the sand bank beyond the northern end of the golf links. I saw no trace of the grass here in the autumn of 1914, when I examined this part of the Bull in

search of *Artemisia Stellariana*, and there can be little doubt that the Elymus was somehow introduced here in the interval. It may have been sown as a binder of the sands, though the abundance all round of *Psamma arenaria*, an equally efficient binder, renders that explanation improbable. Or, still more improbable, it may have been drifted by a southerly gale across some twelve miles of sea from the railway bank where it has been sown along the shore near Bray. Or, most probable solution of all, since the grass is cultivated as an ornamental species, it may be a garden outcast thrown on the mainland shore of the creek near Raheny, whence, like the Kamtschathan Artemisia, it has been floated across the narrow water channel to find a resting place amongst the dense fringe of Psamma on the seaward edge of the Bull. Against this assumption of a recent introduction, it might be maintained that the Elymus has been long established on the North Bull and only lately disclosed by a shifting of the sands. But since the sand drift sets steadily towards and not away from the present station of the grass this disclosure seems highly improbable.

Near the Elymus stations, but farther inland amongst thick beds of Psamma, seven growing plants of *Asparagus officinalis* were found, scattered over about half a mile's length of the dunes. Two of these plants bore tall fruiting stems, and the species, obviously originating from garden outcasts on the mainland shore at Raheny, will, no doubt, become a permanent member of the North Bull flora.

N. Colgan.

Sandycove, Co. Dublin.

## ZOOLOGY.

### Quail and Wren on Migration at Maidens Lighthouse.

On the night of October 4th, 1916, Mr. Barlow picked up a dead Quail on the balcony of the Maidens lighthouse tower. The bird proved to be an adult female in splendid condition. Almost synchronously a dead adult female Wren was picked up in very good condition. I am indebted to Mr. Barlow for forwarding these specimens for investigation.

C. J. Patten.

University, Sheffield.

### Migration at Mutton Island.

The following notes are taken from letters received from Mr. Glanville, keeper of Mutton Island lighthouse :—A Grey Wagtail was observed on August 5th, and on August 10th one wagtail was observed going south and another heard calling. Mr. Glanville believes both were White Wagtails, which he says he was familiar with while on the Tuskar. On July 29th, two Bar-tailed Godwits were observed, and on August 19th a Black-tailed Godwit. A Greenshank was on the island from August 19th until August 22nd. During the latter end of August and early part of September wagtails were numerous on the island and many passed

over. On August 28th Mr. Glanville watched for over an hour three Yellow Wagtails feeding on flies about some decaying sea-weed.

ROBERT F. RUTTLEDGE.

Bloomfield, Hollymount, Co. Mayo.

## Black Redstart in Co. Wexford.

On the morning of November 4th two Black Redstarts in female or immature plumage appeared on the roof and portico of this house, having probably been driven out of their course by the great storm that had blown from the south during the whole of the preceding day. They remained here for nine days, and were last seen a little before sunset on the evening of the 12th—a beautifully fine, calm day, on which the barometer stood at the highest point it had reached since the birds' arrival, so that the selection of their time for departure would seem to have been highly judicious. This is the first occasion on which the Black Redstart has been noted—so far as I am aware—in this part of Co. Wexford, which is eighteen miles from the nearest sea to eastward, and twenty-two from the south coast. I should be glad to know if it has shown itself at other inland stations during the present winter, and under what sort of meteorological conditions. Owing to its preference for porches and window-sills it is somewhat less likely than most of the smaller migrants to escape observation when it reaches a new locality.

C. B. MOFFAT.

Ballyhyland, Co. Wexford.

## Little Bustard in Co. Clare.

A female Little Bustard, *Otis tetrax*, in beautiful plumage was shot near Ennis, Co. Clare, on December 20th, 1916, and sent to Messrs. Williams, where it is being mounted for me. This is the seventh specimen obtained in Ireland, for of the eight individuals observed between 1833 and 1892 two managed to elude capture.

C. J. CARROLL.

Rocklow, Fethard.

## Bat Flying in Daylight.

On the 15th December last, over a frozen mill pond near Downpatrick, in a bright sun at the hour of 1.25 p.m., I watched for some time a small bat hawking, exactly like a Swallow over water, and like the latter frequently dipping down to touch the ice for a brief moment and off again. Several times it came within a few feet of me, but unfortunately I do not know the different species or I could easily have distinguished it. Only once before have I seen a bat out in the daytime, but then it was in the late spring or early summer about twelve years ago in the County Cavan. The hour was noon, and it was hawking under the shade of trees, although the sun was shining as in the present case.

J. H. H. SWINEY.

Cloghaneely, Belfast.

# SOME IRISH ICHNEUMONIDAE.

BY REV. W. F. JOHNSON, M.A., F.E.S., M.R.I.A.

Last year was not at all favourable to the pursuit of Ichneumon Flies. These insects like to fly in the sunshine, and its absence makes them lethargic, so that very few are met with; they are also more partial to the morning hours than the afternoon. As last year was anything but noted for sunshine and had more than its share of rain and dull weather, it will easily be realised that my captures were not so numerous as usual. However by taking advantage of what sunshine there was I managed to pick up some specimens here through the spring and summer; I also got some specimens at Coolmore where I spent September, and Mr. J. J. F. X. King, F.E.S., allows me to record some Irish captures of his.

I was very glad to take *Ichneumon militaris* Grav. again, for as I pointed out in my last paper[1] there had been some doubts about this species which my capture cleared up. I give *I. emancipatus* Wesm. with reserve, as I am not quite satisfied as to its identity. It is very interesting to observe these insects searching for their prey. They will alight on a leaf and instantly run to underside, then on to the next, up the stem and down the stem, antennae quivering and the whole creature instinct with a hunter's eagerness. So active are they in their movements that it is very hard to follow them and often as I have watched I have never yet seen one strike its victim, but I hope some day to see and observe this action.

## ICHNEUMONINAE.

**Cratichneumon annulator** Fab.—Coolmore at flowers.

**Barichneumon anator** Fab.—Coolmore on the wing, a male.

**B. ridibundus** Gr.—Coolmore among sallows, a male variety with head, meso- and metathorax and hind femora except extreme base, black.

**B. incubitor** L.—Poyntzpass in fields in June and August.

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[1] *Irish Naturalist*, vol. xxv., 1916, pp. 18, 19.

**Barichneumon albicinctus** Gr.
**B. lepidus** Gr. } —Poyntzpass in fields in June.

**Ichneumon lugens** Gr.—Kenmare, taken by J. J. F. X. King in August, a female with black scutellum.

**I. sarcitorius** L.—Coolmore, a male captured on the outside wall of the bungalow.

**I. militaris** Gr.—Poyntzpass. I took another female of this interesting species at Hogweed in one of my fields in June.

**I. emancipatus** Wesm. (?)—Coolmore, on the roadside, a male.

**I. caloscelis** Wesm.—Coolmore among sallows.

**Probolus alticola** Gr.—Coolmore, three females among herbage on a grassy bank, and two males on the wing, all were taken at the same time and the females appeared to be freshly emerged.

**Platylabus orbitalis** Gr.—Poyntzpass in fields in August, a male var. with the hind tarsi white; Coolmore among herbage on the roadside, a female of the var. *subalbellus* Gr.

**Phaeogenes planifrons** Wesm.—Poyntzpass in fields in June.

**P. melanogonus** Gm.
**P. rusticatus** Wesm. } Poyntzpass in fields in August.

**Colpognathus divisus** Thoms.—Coolmore among sallows.

**Hemichneumon elongatus** Ratz.—Poyntzpass on roadside in May.

## CRYPTINAE.

**Microcryptus perspicillator** Gr.—Poyntzpass in fields in August, a male var. with light-coloured antennae.

**M. improbus** Grav.

**Acanthocryptus nigricollis** Thoms.—Coolmore among sallows.

**Glyphichnemis vagabunda** Gr.—Poyntzpass in fields in July. Cappoquin, Co. Waterford, in July, by J. J. F. X. King.

**Phygadeuon ambiguus** Gr.
**P. hercynicus** Gr. } Poyntzpass in August in fields. Coolmore on roadside among herbage.

**P. inflatus** Thoms.—Poyntzpass in fields in June, male and female; one of the latter had the legs dark. Coolmore on Wild Carrot.

**Hemiteles conformis** Gm.—Coolmore in porch of bungalow.

**H. cingulator** Gr.—Poyntzpass in stable window and in fields in July.

**H. subzonatus** Gr.—Poyntzpass in fields in July.

**H. tristator** Gr.—Poyntzpass on hill in June and in stable in July. Coolmore in porch of bungalow.

**Stilpnus gagates** Gr.—Coolmore on roadside among herbage.

**Atractodes exilis** Hal.—Coolmore on roadside among herbage. Haliday says it is very rare in Ireland. I took it at Curraun Achill and Mr. Morley took it at Louisburgh and on Clare Island, *vide* Clare Island Survey (*Proc. R.I.A.* vol. xxxi., part 24, p. 11.)

**Spilocryptus migrator** Fat.—Poyntzpass in fields in August.

**S. abbreviator** Fat.—Poyntzpass in field in August.
var. **Hopei** Gr.—Coolmore on roadside: this is a female variety.

**Goniocryptus titillator** L.—Poyntzpass in fields in July and August.
**Cryptus dianae** Gr.—Poyntzpass in August in fields.

## PIMPLINAE.

**Pimpla brevicornis** Gr.—Coolmore among sallows.
**P. punctiventris** Thoms.—Coolmore roadside among herbage.
**P. instigator** Fab.—Cappoquin in August, taken by J. J. F. X. King.
**P. maculator** Fab.—Poyntzpass in June in field.
**Clistopyga incitator** Fat.—Poyntzpass in June in garden.
**Glypta ceratites** Gr.—Poyntzpass in August in field, a male var. with claws not pectinate.
**G. trochanterata** Bridg.—Poyntzpass in June and August; among those taken in June was a female which varied in having the hind trochanters partly black instead of entirely so.
**G. annulata** Bridg.—Coolmore among sallows.
**Stilbops chrysostoma** Gr.—Coolmore on roadside among herbage.
**Banchus moniliatus** Gr.—Kilmacrenan, Co. Donegal, taken by J. J. F. X. King in July. It is rare in Great Britain, being only recorded from Colchester, Portland, South Devon and Galashiels.

## TRYPHONINAE.

**Metopius dentatus** Fab.—On mountain near Cookstown, flying over heather, taken by Mr. Thomas Greer. I took this handsome insect at Coolmore. It has been bred from *Lasiocampa callunae*, *L. quercus* *L. trifolii*, *L. quercifolia* and *Saturnia carpini*.
**Exochus podagricus** Gr.—Poyntzpass in June in field.
**E. niger** Bridg.—Coolmore among sallows, rare.
**E. prosopius** Gr.—Coolmore among sallows, not common.
**Bassus multicolor** Gr.—Poyntzpass in August in field, rare.
**Homocidus dimidiatus** Schr.—Coolmore on sandhills.
**H. xanthaspis** Thoms.—Coolmore among sallows.
**H. elegans** Gr. var. **nigritarsus** Gr.—Bellurgan, Co. Louth, in June, among herbage, on seashore, a male.
**H. hygrobius** Thoms.—Caught on the wing when driving to Newry in July.
**Promethus sulcator** Gr. } —Poyntzpass in August in field.
**P. pulchellus** Hlgr. }
**P. dorsalis** Hlgr.—Poyntzpass in May in field, uncommon.
**Mesoleius rufonotatus** Hlgr.—Coolmore among sallows.
**M. aulicus** Gr.—Poyntzpass in June in field.
**Trematopygus vellicans** Gr.—Poyntzpass in August on hill, scarce.
**Tryphon elongator** Fat.—Coolmore on Owen's Fort, at flowers of Wild Carrot.
**T. brachyacanthus** Gm.—Poyntzpass in August on hill, rare.
**T. vulgaris** Hlgr.—Poyntzpass in August, in field.
**T. brunniventris** Gr.—Poyntzpass in August in field. Coolmore on Owen's Fort, at flowers.

**Mesoleptus prosoleucus** Gr.—Coolmore in August on roadside, at flowers, a female, rare.

**M. leptocerus** Gr.—Poyntzpass in August in field, rare

**Polyblastus sphaerocephalus** Gr.—Poyntzpass in August in field. Coolmore on roadside among herbage.

**P. pastoralis** Gr.—Poyntzpass in June in field.

**P. pratensis** Gr.—Poyntzpass in June in Acton Wood, rare.

**P. rivalis** Hlgr.—Coolmore among sallows, rare.

## OPHIONINAE.

**Diaparsus geminus** Hlgr.—Poyntzpass in May in field.

**D. microcephalus** Gr.—Poyntzpass in August in field. Coolmore on roadside.

**Campoplex falcator** Fat.—Coolmore among sallows.

**Limnerium annulator** Zett.—Coolmore among herbage.

**L. xanthostoma** Gr.—Poyntzpass on hill in June, on hill and in fields in August. Coolmore among sallows.

**Omorga difformis** Gmel.—Poyntzpass in field in July.

**O. cursitans** Hlgr.—Poyntzpass in fields in June.

**O. multicincta** Gr.—Poyntzpass hill in May, lane in June.

**Olesicampa sericea** Hlgr.—Poyntzpass in field in August.

**Meloboris crassicornis** Gr.—Poyntzpass in fields in June.

**Angitia insectator** Schr.—Coolmore on roadside.

**A majalis** Gr.—Coolmore in window.

**A. fenestralis** Hlgr.—Poyntzpass hill in May.

**A. armillata** Gr.—Poyntzpass in Acton Wood in June.

**A. interrupta** Hlgr.—Coolmore among herbage. Poyntzpass in fields in May, June and July.

**A. tripunctata** Bridg.—Poyntzpass hill in July.

**Schizoloma capitata** Desv.—Kilmacrenan in July.

**Anomalon cerinops** Gr.—Kilmacrenan in July.

**Labrorhynchus nigricornis** Wesm.—Cappoquin in August. The three last-named species were taken by J. J. F. X. King.

**Ophion distans** Thoms.—Poyntzpass in October in my house.

Poyntzpass, Co. Armagh.

# MEASUREMENTS AND WEIGHTS OF BIRDS' EGGS.

BY NEVIN H. FOSTER, F.L.S., M.R.I.A., M.B.O.U.

One hundred and thirty-six species of birds breed, or have been known to breed in the past hundred years, in Ireland; and of these are appended from my own collection of their eggs the measurements, *i.e.*, greatest length and greatest width, and weights of the empty shells. The measurements are given in millimetres and the weights in grammes. It may be well to state that a few of these eggs (Carrion-Crow, Redstart, Harriers, Eagles, Bittern, Spotted Crake, Red-throated Diver, and two or three others) are not "Irish taken" specimens. The order and nomenclature followed is that of the "B.O.U. List," 2nd edition, and where that differs from the better known nomenclature adopted in Howard Saunders' "Manual of British Birds," the latter is given in square brackets.

**Raven,** *Corvus corax* Linn.—Average of 2 eggs 49·35 × 32·1—weight 1·725.

**Carrion-Crow,** *C. corone* Linn.—Average of 4 eggs 42·67 × 29·78—weight 1·262.

**Hooded Crow,** *C. cornix* Linn.—Average of 4 eggs 42·48 × 29·07—weight 1·2.

**Jackdaw,** *C. monedula* Linn.—Average of 6 eggs 35·4 × 24·99—weight ·8.

**Rook,** *C. frugilegus* Linn.—Average of 23 eggs 41·13 (36·5-45) × 27·51 (25-29·7)—weight 1·045.

**Magpie,** *Pica pica* (Linn.) [*P. rustica*].—Average of 33 eggs 33·62 (30·5-37·3) × 23·71 (22-25·2)—weight ·5958.

An egg 23 × 17·2 in which was no yolk is not included in above average.

**Irish Jay,** *Garrulus glanadrius hibernicus* With. & Hart. [*G. glandarius*].—Average of 3 eggs 30·9 × 22·5—weight ·5066.

**Chough,** *Pyrrhocorax pyrrhocorax* (Linn.) [*P. graculus*].—Average of 2 eggs 39·85 × 28·1—weight 1·025.

**Starling,** *Sturnus vulgaris* Linn.—Average of 17 eggs 30·03 (28-32) × 21·58 (20-22·5)—weight ·497.

**Greenfinch,** *Chloris chloris* (Linn.) [*Ligurinus chloris*].—Average of 21 eggs 19·82 (18·5-21) × 14·105 (13·5-15·5)—weight ·1019.

**Goldfinch,** *Carduelis carduelis britannica* (Hart.) [*C. elegans*].—Average of 5 eggs 17·36 × 12·9—weight ·088.

**Siskin,** *Spinus spinus* (Linn.) [*Carduelis spinus*].—One egg 16 × 14—weight ·06.

**House-Sparrow,** *Passer domesticus* (Linn.).—Average of 32 eggs 21·16 [18·7-25) × 15.13 (13·5-16·5)—weight ·1712.

**Tree-Sparrow,** *P. montanus* (Linn.).—One egg 19·3 × 14·3—weight ·12.

**Chaffinch,** *Fringilla coelebs* Linn.—Average of 9 eggs 18·9 (18-20) × 14·24 (13·5-14·8)—weight ·1211.

**Linnet,** *Acanthis cannabina* (Linn.) [*Linota cannabina*].—Average of 3 eggs 17·4 × 13·5—weight ·08.

**Lesser Redpoll,** *A. linaria cabaret* (Müll.) [*Linota rufescens*].—Average of 7 eggs 15·64 × 11·82—weight ·0643.

**Twite,** *A. flavirostris* (Linn.) [*Linota flavirostris*].—Average of 3 eggs 17·93 × 13·23—weight ·0833.

**British Bullfinch,** *Pyrrhula pyrrhula pileata* MacGill. [*Pyrrhula europaea*].—Average of 5 eggs 19·24 × 14·04—weight ·118.

**Crossbill,** *Loxia curvirostra* Linn.—One egg 21 × 16—weight ·15.

**Corn-Bunting,** *Emberiza calandra* Linn. [*E. miliaria*].—Average of 5 eggs 23·1 × 16·58—weight ·194.

**Yellow-Hammer,** *E. citrinella* Linn.—Average of 13 eggs 20·57 (19-22) × 15·7 (15-17·7)—weight ·1581.

A yolkless egg in the collection measuring 13·7 × 11 is not included in above average. This egg is heavily pigmented all over its surface.

**Reed-Bunting,** *E. schoeniclus* Linn.—Average of 9 eggs 19·54 × 14·31—weight ·1211.

**Sky-Lark,** *Alauda arvensis* Linn.—Average of 5 eggs 25·04 × 16·92—weight ·22.

**Wood-Lark,** *Lullula arborea* (Linn.) [*Alauda arborea*].—One egg 26·7 × 16—weight ·17.

**Pied Wagtail,** *Motacilla lugubris* Temm.—Average of 7 eggs 19·24 × 15·06—weight ·1286.

**Grey Wagtail,** *M. boarula* Scop. [*M. melanope*].—Average of 4 eggs 18·42 × 14·33—weight ·105.

**Yellow Wagtail,** *M. raii* (Bonap.).—Average of 2 eggs 19·75 × 14·5—weight ·105.

**Meadow-Pipit,** *Anthus pratensis* (Linn.).—Average of 10 eggs 20·31 (19·8-20·7) × 14·37 (14-15)—weight ·125.

**Rock-Pipit,** *A. petrosus* (Mont.) [*A. obscurus*].—Average of 2 eggs 20·75 × 16·85—weight ·185.

**British Tree-Creeper,** *Certhia familiaris britannica* (Linn.).—Average of 5 eggs 15·04 × 12·04—weight ·0633.

**Goldcrest,** *Regulus regulus* (Linn.) [*Regulus cristatus*].—Average of 6 eggs 14·03 × 10·46—·0392.

**British Great Titmouse,** *Parus major newtoni* Praz. [*Parus major*].—Average of 12 eggs 18·15 (17-20·5) × 12·83 (11·2-14·5)—weight ·1.

**Irish Coal-Titmouse,** *P. ater hibernicus* (Grant) [*P. ater*].—Average of 3 eggs 15·33 × 12—weight ·0633.

**British Blue Titmouse,** *P. coeruleus obscurus* Praz. [*P. coeruleus*].—Average of 3 eggs 14·66 × 11·93—weight ·0633.

**British Long-tailed Titmouse,** *Aegithalus caudatus roseus* (Blyth) [*Acredula caudata*].—One egg 14× 11—weight ·05.

**Whitethroat,** *Sylvia communis* Latham [*S. cinerea*].—Average of 9 eggs 17·72× 13·49—weight ·0955.

**Garden-Warbler,** *S. simplex* Latham [*S. hortensis*].—Average of 3 eggs 18·33× 14·6—weight ·123.

**Blackcap,** *S. atricapilla* (Linn.).—Average of 4 eggs 19·55× 14·65—weight ·125.

**Grasshopper-Warbler,** *Locustella naevia* (Bodd.).—Average of 2 eggs 17·75× 14·25—weight ·1.

**Sedge-Warbler,** *Acrocephulus schoenobaenus* (Linn.) [*A. phragmitis*].—Average of 2 eggs 16·35× 12·9—weight ·075.

**Willow-Warbler,** *Phylloscopus trochilus* (Linn.).—Average of 6 eggs 14·83× 12·15—weight ·059.

**Wood-Warbler,** *P. sibilatrix* (Bechst.).—One egg 17·7× 12·2—weight ·071.

**Chiffchaff,** *P. collybita* (Vieil.) [*P. rufus*].—Average of 4 eggs 15·6× 12·3—weight ·07.

**Missel-Thrush,** *Turdus viscivorus* Linn.—Average of 15 eggs 31·32 (29·8-34·5)× 22·11 (20-23·8)—weight ·4566.

**British Song-Thrush,** *T. musicus clarkii* Hart. [*T. musicus*].—Average of 26 eggs 27·31 (24-29·5)× 20·6 (19·5-22·5)—weight ·3615.

**Blackbird,** *T. merula* Linn.—Average of 18 eggs 30·23 (26-33)× 21·65 (19-25)—weight ·44.

**Ring-Ousel,** *T. torquatus* Linn.—Average of 4 eggs 29·8× 21·88—weight ·4325.

**Redstart,** *Phoenicurus phoenicurus* (Linn.) [*Ruticilla phoenicurus*].—Average of 2 eggs 18·75× 13·45—weight ·9.

**British Redbreast,** *Erithacus rubecula melophilus* Hart. [*E. rubecula*].—Average of 9 eggs 19·78× 15·39—weight ·15.

**Stonechat,** *Saxicola rubicola* (Linn.) [*Pratincola rubicola*].—Average of 4 eggs 19·37× 14·1—weight ·105.

**Whinchat,** *S. rubetra* (Linn.) [*P. rubetra*].—Average of 2 eggs 18·65× 14—weight ·11.

**Wheatear,** *Oenanthe oenanthe* (Linn.) [*Saxicola oenanthe*].—Average of 4 eggs 20·35× 15·17—weight ·1375.

**Hedge-Sparrow,** *Accentor modularis* (Linn.).—Average of 12 eggs 20·29 (19-22)× 14·3 (13·7-15)—weight ·133.

**Irish Dipper,** *Cinclus cinclus hibernicus* Hart. [*Cinclus aquaticus*].—Average of 2 eggs 26× 18—weight ·24.

**Wren,** *Troglodytes troglodytes* (Linn.) [*Troglodytes parvulus*].—Average of 6 eggs 16·33× 12·45—weight ·075.

**Spotted Flycatcher,** *Musicapa griseola* Linn.—Average of 7 eggs 18·09× 13·84—weight ·1.

**Swallow,** *Hirundo rustica* Linn.—Average of 5 eggs 19·64× 13·8—weight ·104.

**Martin,** *Delichon urbica* (Linn.) [*Chelidon urbica*].—Average of 3 eggs 19·5× 13·93—weight ·1066.

**Sand-Martin,** *Riparia riparia* (Linn.) [*Cotile riparia*].—Average of 4 eggs 17·43× 12·82—weight ·078.

**Cuckoo,** *Cuculus canorus* Linn.—Average of 4 eggs 22·05× 16·55—weight ·1728.

**Swift,** *Micropus apus* (Linn.) [*Cypselus apus*].—Average of 3 eggs 24·67 × 16·13—weight ·23.

**Nightjar,** *Caprimulgus europaeus* Linn.—Average of 4 eggs 31·7× 22·55—weight ·625.

**Kingfisher,** *Alcedo ispida* Linn.—Average of 3 eggs 23·4× 18·73—weight ·2166.

**Barn-Owl,** *Flammea flammea* (Linn.) [*Strix flammea*].—Average of 2 eggs 40·75× 30·6—weight 1·45.

**Long-eared Owl,** *Asio otis* (Linn.).—Average of 2 eggs 41·25× 32·5—weight 1·575.

**Marsh-Harrier,** *Circus aeruginosus* (Linn.).—One egg 49·5× 39·3—weight 4·05.

**Hen-Harrier,** *C. cyaneus* (Linn.).—Average of 2 eggs 48·25× 36·25—weight 3·05.

**Buzzard,** *Buteo buteo* (Linn.) [*B. vulgaris*].—Average of 3 eggs 54·77× 46·83—weight 4.6833.

**Golden Eagle,** *Aquila chrysaëtus* (Linn.).—One egg 72·3× 58·3—weight 13·2.

**White-tailed Eagle,** *Haliaëtus albicilla* (Linn.).—One egg 70·7× 55·7—weight 11·2.

**Sparrow-Hawk,** *Accipiter nisus* (Linn.).—Average of 12 eggs 39·375 (37-42) × 32·525 (32-33)—weight 1·821.

**Peregrine Falcon,** *Falco peregrinus* Tunst.—One egg 51·2× 37·8—weight 3·85.

**Merlin,** *F. aesalon* Tunst.—Average of 3 eggs 39·23× 31·3—weight 1·583.

**Kestrel,** *F. tinnunculus* Linn.—Average of 11 eggs 39·77 (38-42·2)× 31·23 (29·8-33)—weight 1·6.

**Cormorant,** *Phalacrocorax carbo* (Linn.).—One egg 66·7× 41·5—weight 7·1.

**Shag,** *P. graculus* (Linn.).—Average of 3 eggs 61·3× 38·4—weight 4·833.

**Gannet,** *Sula bassana* (Linn.).—Average of 5 eggs 75·78× 49·06—weight 10·966.

The eggs of the Order Pelicaniformes are thickly incrusted on the outside with a chalky secretion. In the above three species this incrustation was not removed before weighing, but on scraping it off one of the Gannet's eggs it was found that without it this egg weighed 1·5 grammes less.

**Mute Swan,** *Cygnus olor* (Gmel.).—Average of 7 eggs 109·86 (104-113·5) × 72·14 (68·5-75)—weight 38·943.

**Common Sheld-Duck,** *Tadorna tadorna* (Linn.) [*Tadorna cornuta*].—One egg 64× 45·7—weight 6·4.

**Wild Duck or Mallard,** *Anas boschas* Linn. [*A. boscas*].—Average of 6 eggs 58·72× 41·92—weight 4·783.

**Common Teal,** *Querquedula crecca* (Linn.) [*Nettion crecca*].—Average of 3 eggs 43·766× 32·4—weight 1·78.

**Shoveler,** *Spatula clypeata* (Linn.).—Average of 5 eggs 50·1 × 37·36—weight 2·71.

**Pintail,** *Dafila acuta* (Linn.).—One egg 53·5 × 41·7—weight 4·35.

**Pochard,** *Nyroca ferina* (Linn.) [*Fuligula ferina*].—Average of 2 eggs 61·1 × 44·1—weight 6·45.

**Tufted Duck,** *N. fuligula* (Linn.) [*Fuligula cristata*].—Average of 3 eggs 56·1 × 40·5—weight 4·25.

**Common Scoter,** *Oedemia nigra* (Linn.).—Average of 3 eggs 62·63 × 43·9—weight 4·95.

**Red-breasted Merganser,** *Mergus serrator* Linn.—Average of 5 eggs 64·24 × 45·3—weight 6·326.

**Heron,** *Ardea cinerea* Linn.—Average of 5 eggs 59·82 × 41·34—weight 4·554.

**Bittern,** *Botaurus stellaris* (Linn.).—One egg 52·2 × 37·5—weight 2·43.

**Red-necked Phalarope,** *Phalaropus lobatus* (Linn.) [*P. hyperboreus*].—One egg 30·2 × 20·2—weight ·35.

**Woodcock,** *Scolopax rusticola* Linn.—Average of 3 eggs 42·76 × 33·76—weight 1·4.

**Common Snipe,** *Gallinago gallinago* (Linn.) [*Gallinago coelestis*].—Average of 7 eggs 38·89 × 28·34—weight ·8357.

**Dunlin,** *Tringa alpina* Linn.—Average of 6 eggs 34·44 × 24·78—weight ·483.

**Redshank,** *Totanus totanus* (Linn.) [*Totanus calidris*].—Average of 5 eggs 43·8 × 31·64—weight 1·23.

**Common Sandpiper,** *Totanus hypoleucus* (Linn.).—Average of 4 eggs 36·125 × 24·98—weight ·58.

**Curlew,** *Numenius arquata* (Linn.).—Average of 5 eggs 70·24 × 48·38—weight 4·82.

**Golden Plover,** *Charadrius apricarius* Linn. [*C. pluvialis*].—One egg 47·5 × 35·7—weight 1·55.

**Ringed Plover,** *Aegialitis hiaticula* (Linn.)—Average of 4 eggs 36·5 × 26·25—weight ·7.

**Lapwing,** *Vanellus vanellus* (Linn.) [*V. vulgaris*].—Average of 9 eggs 46·39 (44-48) × 33·92 (30·3-34)—weight 1·478.

**Oyster-catcher,** *Haematopus ostralegus* Linn.—Average of 4 eggs 56·45 × 45·4—weight 3·375.

**Common Gull,** *Larus canus* Linn.—Average of 2 eggs 56·35 × 40·65—weight 3·115.

**Herring-Gull,** *L. argentatus* Ponto.—Average of 35 eggs 68·97 (64·5-78) × 48·5 (43·7-53·3)—weight 5·71.

**Greater Black-backed Gull,** *L. marinus* Linn.—Average of 3 eggs 76·87 × 54·33—weight 8·27.

**British Lesser Black-backed Gull,** *L. fuscus affinis* (Linn.).—Average of 4 eggs 69·125 × 49·65—weight 6·1.

**Black-headed Gull,** *L. ridibundus* Linn.—Average of 8 eggs 51·71 × 37·75—weight 2·3312.

**Kittiwake,** *Rissa tridactyla* (Linn.).—Average of 4 eggs 55·7 × 38·625—weight 2·625.

**Common Tern,** *Sterna hirundo* Linn. [*S. fluviatilis*].—Average of 43 eggs 42·52 (38-47·7) × 29·84 (28-31·7)—weight 1.0756.

**Arctic Tern,** *S. paradisea* Brün. [*S. macrura*].—Average of 26 eggs 40·69 (38-44·8) × 29·36 (25·5-31)—weight 1·0288.

**Roseate Tern,** *S. dougalli* Mont.—Average of 3 eggs 41·16 × 29·93—weight 1·12.

**Little Tern,** *S. minuta* Linn.—Average of 7 eggs 31·86 × 24—weight ·56.

**Sandwich Tern,** *S. sandvicensis* Lath. [*S. cantiaca*].—Average of 3 eggs 52·52 × 36·9—weight 2·566.

**Razorbill,** *Alca torda* Linn.—Average of 8 eggs 75·05 (72·3-79) × 48·31 (46-51·5)—weight 9·49.

**Common Guillemot,** *Uria troille* (Linn.) [*U. troile*].—Average of 18 eggs 80·8 (75·5-89) × 50·25 (48-53)—weight 12·37.

**Black Guillemot,** *U. grylle* (Linn.).—Average of 2 eggs 62·75 × 40·5—weight 4·55.

**Puffin,** *Fratercula arctica* (Linn.).—Average of 6 eggs 60·83 × 42·87—weight 3·9167.

**Storm-Petrel,** *Thalassidroma pelagica* (Linn.) [*Procellaria pelagica*].—Average of 4 eggs 27·95 × 21—weight ·4.

**Leach's Petrel,** *Oceanodroma leucorrhoa* (Vieill.).—One egg 33·3 × 24—weight ·55.

**Manx Shearwater,** *Puffinus puffinus* (Brün.) [*Puffinus anglorum*].—One egg 58 × 43—weight 3·8.

**Fulmar,** *Fulmarus glacialis* (Linn.).—Average of 2 eggs 74·6 × 50·6—weight 8·45.

**Red-throated Diver,** *Colymbus stellatus* (Pont.) [*C. septentrionalis*].—Average of 3 eggs 74·66 × 45·5—weight 6·6833.

**Great Crested Grebe,** *Podiceps cristatus* (Linn.) [*Podicipes cristatus*].—Average of 4 eggs 54·62 × 35·875—weight 3·375.

**Little Grebe,** *P. fluviatilis* (Tunst.) [*Podicipes fluviatilis*].—Average of 6 eggs 39·22 × 26·42—weight 1·1917.

**Water-Rail,** *Rallus aquaticus* Linn.—Average of 4 eggs 35·25 × 25·9—weight ·9122.

**Spotted Crake,** *Porzana porzana* (Linn.) [*Porzana maruetta*]. One egg 31 × 23·5—weight ·75.

**Corn-Crake,** *Crex crex* (Linn.) [*Crex pratensis*].—Average of 17 eggs 36·85 (34-40) × 25·82 (25·2-27)—weight ·834.

**Moor-Hen,** *Gallinula chloropus* (Linn.).—Average of 19 eggs 43·73 (41-47·2) × 30·61 (27·5-33)—weight 1·9447.

**Coot,** *Fulica atra* Linn.—Average of 6 eggs 51·95 (48·5-54) × 36·04 (33·2-39·5)—weight 3·4.

**Stock-Dove,** *Columba aenas* Linn.—Average of 2 eggs 36 × 28·6—weight 1·25.

**Ring-Dove** or **Wood-Pigeon,** *C. palumbus* Linn.—Average of 9 eggs 40·67 (37-42) × 29·08 (27-30)—weight 1·261.

**Rock-Dove,** *C. livia* Bonn.—One egg 41 × 28—weight 1·1.

**Turtle-Dove,** *Streptopelia turtur* (Linn.) [*Turtur communis*].—One egg 30 × 22·5—weight ·5.

**Pheasant,** *Phasianus colchicus* Linn.—Average of 6 eggs 44·67 × 35·68—weight 3·05.

**Partridge,** *Perdix perdix* (Linn.) [*Perdix cinerea*].—Average of 3 eggs 37·17 × 28·33—weight 1·65.

**Quail,** *Coturnix coturnix* (Linn.) [*Coturnix communis*].—Average of 7 eggs 31·71 × 23·84—weight ·8286.

**Red Grouse,** *Lagopus scoticus* (Lath.).—Average of 4 eggs 44·1 × 31·9—weight 1.775.

In previous issues of this Journal[1] the dimensions and weights of *full* eggs of 109 species were recorded. The two following have since been examined :—

DUNLIN (*Tringa alpina*)—(¾ hatched).

| Inch. | | Inch. | | Grains. | Inch. | | Inch. | | Grains. |
|---|---|---|---|---|---|---|---|---|---|
| 1·37 | × | 1· | — | 159½ | 1·4 | × | ·97 | — | 154 |
| 1·33 | × | ·98 | — | 155½ | 1·38 | × | ·98 | — | 155½ |

STOCK-DOVE (*Columba aenas*).

| Inch. | | Inch. | | Grains. |
|---|---|---|---|---|
| 1·43 | × | 1·15 | — | 264½ |

Hillsborough, Co. Down.

# OBITUARY.

## WILLIAM GRAY.

The death, in his eighty-sixth year, of Mr. William Gray, removes one of the pioneers of the Belfast Naturalists' Field Club, and one of the most familiar figures in scientific circles in Belfast. Mr. Gray belonged to the period when a "naturalist" was expected to know something of the whole range of science, and he acquired a wide knowledge of local geology, zoology, and archaeology. But detailed study did not appeal to him, and though he collected extensively and had a very complete knowledge of the district in which he lived and worked, he contributed but little to scientific literature during his long and active life. This is to be regretted, as for many years his position as inspector under the Board of Public Works gave him exceptional opportunities for scientific study throughout the counties of Antrim and Down. He was much esteemed by his fellow-members of the Belfast Naturalists' Field Club who elected him as President for the years 1879-81 and 1889-91.

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[1] *Vide* vols. x., xi., xii., xvi., and xviii.

# IRISH SOCIETIES.

## ROYAL ZOOLOGICAL SOCIETY.

Recent gifts include a Badger from Mrs. Lendrum, Cavies from Miss Grattan Bellew, and a Ring-necked Parrakeet from Mrs. Newman. A Diana Monkey, a Mona Monkey, and a Woolly Monkey have been received on deposit, and three White-Collared Mangabeys and two Sooty Mangabeys in exchange. A pair of Swans have been acquired by purchase.

JANUARY 31.—ANNUAL GENERAL MEETING held in the theatre of the Royal Dublin Society (by permission), the Rt. Hon. JONATHAN HOGG, ex-President, in the chair. In opening the proceedings, he referred to the loss sustained by the Society through the deaths within the year of two Presidents: Sir Charles Ball, Bart., and W. E. Peebles, J.P.

Prof. G. H. CARPENTER (Hon. Secretary) moved the adoption of the Council's Report.

This is the third Report presented to the Society since the outbreak of war. Another year of much difficulty, on account of reduced attendance and diminished receipts from ordinary sources of income, has passed; the Council desires to record thankfully that, through the generous support of members, the Society closes the year in a distinctly stronger position than was the case twelve months ago. At the end of December, 1915, there was an adverse balance of £447; this has now been reduced to £225. The decrease of gate receipts during the past year is attributable to the continuance of war conditions, intensified by the abnormal loss on account of the Easter-week rebellion, to which reference is made below. The Easter holiday entrance payments in 1915 amounted to £132, whereas they were barely £62 in 1916. But the number of visitors to Dublin was lower than ever all through the summer, so that another fall of £250 in the gate receipts has to be recorded. All soldiers and sailors in uniform are now admitted at half-price on week-days, and this privilege is utilized to a gratifying extent.

The increasing economic strain has also reduced seriously the number of members; it is satisfactory to record the admission of ten new life-members. Thirty-four annual members and ten garden subscribers joined during 1916, and several have reluctantly resigned their membership. The result is a decrease of £54 in entrance fees and subscription.

A year ago it was hoped that further appeals to members of the Society for monetary help might be avoided. But the loss incurred during Easter week, the falling off of admission payments throughout the summer, and the continual increase in the cost of food and fuel combined to produce a financial situation so threatening that the Council felt it necessary to lay the needs of the Society again before its supporters by means of a circular letter. The appeal of 1914 brought in gifts amounting to £420. This encouraging result was far surpassed during the last six months of 1916, when contributions reaching a total of £575 were sent, in many cases with cheering letters expressing true concern for the welfare of the Society. The Council, on whom has fallen the responsibility of guiding the Society's

affairs through these trying days, cannot but express gratitude for the support that has been accorded, and acknowledge with hearty thankfulness the generous action of the members at this time of need. During the last few days of the year a promise of a further gift of £100—as to the source of which anonymity is enjoined—has been received; this sum will not be paid until 1917, and cannot, therefore, be included in the accounts now presented, which show a deficit of £225. The Council is doing its best to ensure economy in administration, and favourable engagements have been made for the supply of coal, coke, and hay. Nevertheless the coal bill is 50 per cent. higher than in 1915.

A year ago, Sir Charles Ball, Bart., M.D., retired from the Presidency of the Society, and Mr. W. E. Peebles was elected in his place. It is with the deepest regret that the Council now record the death of both these old and valued supporters of the Society, which has never before lost an ex-President and a President within twelve months.

Sir Charles Ball, whose failing health prevented him from taking the chair at the last annual meeting, died on March 17th (St. Patrick's Day), 1916. The third son of Robert Ball, who was Secretary of the Society from 1837 till 1857, Charles became a member in 1882, and he was elected on the Council in 1895, becoming President in 1910. During the last two years of his life he held a lieutenant-colonelcy in the Royal Army Medical Corps, and there can be little doubt that the exertions and exposure associated with his military duties contributed to the weakness which caused his death at the comparatively early age of 65. A good account of his life may be found in the *Irish Naturalist* for May, 1916.

W. Edward Peebles was the "father" of the Royal Zoological Society, which he joined in 1861, and on whose Council he has served continuously since 1879. A barrister and a sportsman, with many varied interests, he was an admirable type of those men of leisure whose valuable help has always been at the service of the Society. It may be doubted if any member has visited the Gardens more constantly than he, and his counsel was continually at his colleagues' disposal, while his gifts to the collections were generous and frequent. The establishment of the Members' Room in the Haughton House was first suggested by him, and later on he contributed liberally to its enlargement. The Council has now been informed that Mr. Peebles has bequeathed by will a sum of money for the further improvement of the premises and for the erection of necessary buildings in the Gardens in future; all these advantages will therefore remain as material evidence of his benefactions. In 1904 he was elected Honorary Vice-President, and when the members of the Council a year ago unanimously chose him for the Presidency they little thought that he would enjoy that honour for less than a year.

Reference has already been made to the serious monetary loss which the Society suffered as one result of the outbreak in Dublin in Easter week. The difficulty of bringing the collections safely through that week was great, and it is hardly surprising that wild rumours of the shooting of the lions and tigers, because no food could be procured for them, were current, and were believed in some quarters. Members of the Society

should know that the preservation of the collections was mainly due to the zeal and courage of Mrs. B. B. Ferrar and the keepers under her instructions. On Easter Monday, 24th April, the Superintendent had gone as usual to his military duties at the Royal Barracks, where he was necessarily detained from the outbreak of the revolt until Thursday, 4th May. In the morning the Gardens were full of visitors, most of whom hurried away when news of the conditions in the City reached the Park. One family from Dalkey, finding it impossible to get home, returned and was lodged for the night in the Haughton House. The refreshment room was, happily, well stocked with provisions, and the immediate wants of residents and some of the animals were thus provided for. Through the week the keepers could not go to and from their homes, except at risk of their lives; Mrs. Ferrar arranged, therefore, for J. Supple, J. Flood, and T. Kelly to lodge on the premises, and the others attended when they could. Heavy firing about Phibsborough on Tuesday, 25th, was all too audible in the Park, and on Thursday, 27th, rifle bullets passed over the Gardens. The most serious difficulty was the feeding of the large Carnivora; as it was impossible to get horses from the City, it became necessary to sacrifice some of the less valuable stock in the Gardens, so that an old pony, a donkey, a goat, and a few dingoes were used to keep the lions and tigers in food. The Secretary was able to reach the Gardens on three occasions by way of Island Bridge or Chapelizod, and to convey some urgently-needed provisions. By the beginning of the succeeding week permission was obtained from the military authority for the supply of horse-flesh from the City, and all danger of famine was removed. By the middle of the week, it was possible to convey to the Gardens an unexpected gift of monkeys; a few visitors who had permission to enter the Park made their way to the Zoo, and small amounts began to be taken at the gate. On Saturday, 6th May, six members of the Council assembled at nine o'clock, but, owing to the shortage of coal and the absence of gas, no breakfast was provided. On May 13th, however, a fully-attended breakfast and Council meeting coincided with the re-opening of the Park to the public, and the resumption of normal activities at the Gardens.

No change has taken place during the year among the Anthropoid Apes; the Gorilla "Empress," the Chimpanzees "George" and "Charlie," and the Hoolock Gibbon are still the chief attractions of the Monkey House. All have grown and maintained excellent health, the swellings in the neck which troubled the Gorilla during 1916 having now disappeared. The Gorilla must be at present in the fourth year of her age, having completed three full years' residence under J. Supple's care.

Besides the three kinds of Anthropoid Apes just mentioned, there are now in the Gardens twelve Ethiopian, four Oriental, and two South American species of monkey, and three species of Madagascar Lemurs, the twenty-four distinct members of the Primates being represented by forty-seven specimens. It may be doubted if the Monkey House ever contained a more varied and interesting selection. Noteworthy animals comprise an exceptionally large and handsome Patas, which goes through

a curious dancing performance, a rare Roloway from the Gold Coast, and three White-collar Mangabeys, one of which is of great size. A Hamadryas Baboon—the "sacred" monkey of the ancient Egyptians—and a large Anubis Baboon from West Africa live together on friendly terms in the large central cage, which affords them ample scope for mutual chases and climbing competitions. The American group was represented last year by Capuchins. These have, unhappily, all died, but two Humboldt's Woolly Monkeys (Lagothrix), on deposit, worthily represent the New-World Primates, as well as a Feline Douroucouli—an animal rarely seen in collections. A beautiful little Titi, given by Capt. Henderson during the summer, proved very docile and affectionate; unfortunately, it died in October.

Among the older lions, the East African "Fritz," given to the Society four years ago by Mr. H. Gurney Barclay, has died; all the other mature stock is still on view. Four litters of cubs were born during the year, comprising twelve specimens. Of these, three of each sex were in the House at the close of the year; of the remainder, four died, two were sent to Canada in exchange for a Black Bear, Canadian Porcupines and Beavers, while two were sold, together with six of the 1915 cubs. The stock now stands at twenty—ten of each sex.

The old Tigress, "Ranee," given by the Nizam of Hyderabad, died in October, but two handsome pairs of Tigers are left in the House. Unfortunately, the Jaguars and three of the Leopards have died during the year, leaving only one Leopard to represent the larger spotted felines. Promises of gifts to replace these losses have been received, but it is feared that it may not be possible to import them while the war lasts. The Cheetah, given by Capt. Dobbs, died in February, to the grief of many admirers of such a friendly beast. The stock of Bears has been increased by a very fine Black male, received in exchange from the Riversdale Gardens, Toronto.

Unhappily, several interesting and valuable animals in the Herbivore Houses have died during the year. The Eland bull succumbed in March, and the cow, kindly promised a year ago, and given in the spring by the Duke of Bedford, survived only until August. The Indian Antelope, after a long life in the Gardens, also died in August. As some compensation for these losses, a very handsome Zebu bull from Borneo, with two cows, were given by the Zoological Society of London; shortly after arrival in June, one of the latter gave birth to a fine calf; these beasts are kept in the paddock beyond the lake, where they show to great advantage. Another midsummer birth of much interest was that of a female Bison calf, which is thriving; in its early weeks, this calf's fur was of a bright red colour, but it has now assumed the dark coat of its parents. A Greek Boar from Mudros—formerly a warship pet—is another noteworthy acquisition.

Two pairs of Canadian Porcupines have been acquired during the year; these are on view beneath the Haughton House; a new Beaver from Toronto is another gratifying addition to the collection of Rodents. On the other hand, we deplore the loss of the pair of Capybaras, which for

several years had been allowed much liberty around the lakes, and often provided an instructive spectacle to visitors as they swam or walked. A Great Ant-Eater was acquired in September; it lived for some time happily in the Monkey House, and its habits—especially at feeding time, when the long tongue came into play—were a source of much interest. Unfortunately, it died of enteritis in November.

Dr. MacDowel Cosgrave (Hon. Treasurer) seconded the adoption of the Report and Accounts, which were unanimously passed.

The Officers and Council for 1917 were then elected:—President, Sir Frederick Moore; Hon. Treasurer, H. F. Stephens; new members of Council, Col. C. Cane, J. E. Geoghegan, and A. Maude.

Sir F. Moore, the new President, then took the chair, and appealed to the members present for support in the varied activities of the Society.

Prof. J. Alfred Scott gave an account of some of the animals now and formerly in the Gardens, with an excellent set of photographic lantern-slides in illustration.

Prof. J. Arthur Thomson, LL.D., of Aberdeen Univerity, was unanimously elected an Honorary Member of the Society.

## BELFAST NATURALISTS' FIELD CLUB.

December 19.—An address was delivered by A. Deane on "The Childhood of Art" as manifested in the works of the stone age of man. Professor Yapp occupied the chair. An animated discussion followed, in which Professor Yapp, Dr. Charlesworth, Mr. Cleland, and Mr. Milligan took part.

January 16.—N. H. Foster read a paper on "The Mourne Mountains." The chair was occupied by the President (Major A. R. Dwerryhouse). Mr. Foster said that the Mourne Mountains formed the most elevated land in Ulster, and covered an area of about 14 x 7 miles. They were in the main composed of a tough grey granite, but in several of the peaks the old Silurian rock had been lifted with the outflow and now capped the underlying granite. He then proceeded to describe some walks which could be undertaken, and in speaking of the Castles of Commedagh—a wonderful natural feature—said it was strange that so few of Newcastle's visitors had ever viewed this wonderland, which was within two hours' walking of the town. In a granite area the flora and fauna were as a rule poor in number of species, but in the Mourne district several of our rarer plants were to be found. In speaking of the fauna he said that in the recesses of these mountains the Fox and the Badger still lurked, whilst the Pine Marten had been observed in Tollymore Park and in Donard demesne. Our only Irish reptile, the Viviparous Lizard, had been recorded from here. Of the birds frequenting the district Mr. Foster had many things to recount, including the capture at Greencastle some years ago of a specimen of the Antarctic Sheathbill—unique in the northern hemisphere. The paper was illustrated by 60 lantern slides.

# NOTES.

## ZOOLOGY.

### Frogs Spawning in Severe Weather.

I must supplement the note I wrote last winter (vol. xxv. p. 52) on "Frogs spawning in January," by mentioning that during the present winter I saw no frog-spawn until February 14th. On that day, examining three separate spawning pools—two of them half a mile apart—I found masses of the jelly-like substance in them all. The date is ten days later than the latest recorded in my previous note; but as the country on Feb. 14th was still under a mantle of snow which had lain for a full calendar month the difference is not greater than might have been expected. The present winter has been the severest experienced here for 36 years, and the snowfall of January 26th (which fell on ground already twelve days under snow) was the heaviest since that of January 17th, 1881. With the exception of one week—December 28th to January 3rd, inclusive (during which week I may add that Pipistrelles were flying numerously every night)—we have had uninterrupted cold weather since December 10th, and it was only in the immediate neighbourhood of springs, even in the second week of February, that the Frogs *could* spawn, the pools elsewhere being still under ice. It shows how inveterate is their habit of early spawning that they began when they did.

C. B. Moffat.

### Bittern in Co. Tyrone.

My friend, Mr. W. C. Wright, of Belfast, published in *British Birds* for January last that a Bittern (*Botaurus stellaris*) shot near Coalisland, Co. Tyrone, on December 2nd, 1916, proved to be a female, with the feathers of the head and neck in a state of moult. The ovaries were in a diseased state and the stomach contained a perch nine inches long. I think the above of great interest to Irish ornithologists.

W. H. Workman.

Belfast.

### Jays in County Dublin.

Within the last few months a considerable number of Jays, about 30 birds, have appeared in the southern part of the county about Brittas, and are still located there. I am not aware that these birds have ever been observed in the locality before.

G. C. May.

Dublin.

## Summer Migrants at Balbriggan in 1916.

In March last year, I issued more than 100 cards containing a list of migrants with the probable dates of their arrival, hoping in this way to ascertain the range of some of the rarer species.

There were many applications for these cards; but I am sorry to say, that I have received only one return from those to whom they were sent. It is remarkable, however, that it contains the names both of the Redstart and the Garden Warbler, which may be considered decidedly "Rarae Aves" in Ireland.

I append the dates of my own observations here in 1916.

| | | | | | |
|---|---|---|---|---|---|
| 1 Chiff-chaff | April | 5 | 10. Swift | May | 13 |
| 2 Swallow | ,, | 7 | 11 Sandpiper | ,, | 13 |
| 3 Willow Warbler | ,, | 15 | 12 Common Tern | ,, | 16 |
| 4 Corncrake | ,, | 24 | 13 Sedge Warbler | ,, | 17 |
| 5 Sand-Martin | ,, | 26 | 14 House Martin | ,, | 20 |
| 6 Whimbrel | ,, | 27 | 15 Wheatear | ,, | 26 |
| 7 Cuckoo | ,, | 28 | 16 Lesser Tern | ,, | 27 |
| 8 Whitethroat | May | 2 | 17 Spotted Flycatcher | ,, | 28 |
| 9 Grasshopper Warbler | ,, | 12 | | | |

My observation of the Wheatear was extraordinarily late here last year. No observations of the Quail or Blackcap.

CHARLES W. BENSON.

Bedford House, Balbriggan.

## Waxwing in Co. Down.

A Waxwing, *Ampelis garrulus*, was shot here on 1st February, and brought to me for identification. It was feeding on berries of Cotoneaster in a garden close to a dwellinghouse, and is said to have appeared very tame.

Hillsborough, Co. Down. NEVIN H. FOSTER.

# BOTANY.

## Trichia affinis.

I am obliged to Mrs. Stelfox for her correction of my statement at the November meeting of the Dublin Microscopical Club that *Trichia affinis* had only been recorded from Leinster and Munster. At the time I was unaware of the records of the Clare Island Survey. Since that list was printed, some good work has been done in extending the known range of the Mycetozoa in Ireland, not the least of which is to the credit of the writer of the correction. There is little doubt that a careful search in other localities will show that this species is fairly well distributed throughout the country.

Dublin. W. F. GUNN.

## Aquatic Fungi.

Fungi which live in or under water are rare. In the outlet of a little lake on Brandon, in Kerry, at 2,000 feet elevation, in July, 1913, I found a small orange fungus growing on dead heather stems in three feet of water, which was identified at Kew as *Vibrissea truncorum* Fr. Next year (October, 1914) the same plant turned up on dead heather in a foot of water in Lough Dan, Co. Wicklow; and on the day following Miss Jane Stephens obtained further specimens, also on dead heather, in a foot of water in the outlet stream from Lough Tay. These specimens were verified by Miss Knowles. The species is rare in the British Isles; and in Ireland, curiously enough, has been recorded previously only from these same two regions:—Hungry Hill, Co. Cork, 1,000 feet, on dead heather stems in boggy places (M'Weeney in *Irish Naturalist*, ii. 227, 1893), and "Powerscourt, recurring in the same place every spring (Pim); Slade Brook (M'Weeney)"—(Pim and M'Weeney, *Irish Naturalist*, ii., 259, 1893.)

A commoner species of similar appearance and similar habitat is *Mitrula phalloides* Chev. (=*M. paludosa* Fr.). It is recorded from Cloyne Valley, Co. Cork; Powerscourt, Co. Wicklow; Glencullen, Co. Dublin; Slieve Donard and Hilltown, Co. Down, and near Belfast, Co. Antrim. I have a note of having obtained it over twenty years ago in Tollymore Park, Co. Down (named by Canon Lett), and in June of last year got good specimens on dead heather in several inches of water near the Hare's Gap, Mourne Mountains; Miss Knowles kindly identified it.

R. Lloyd Praeger.

Dublin.

## Some Leitrim Fungi.

At Dromahaire, Co. Leitrim, last October, we found an unfamiliar yellow spatula-shaped fungus on limestone pasture in some abundance; and later under trees near the mouth of the Bonet River, on a space of a few square yards, we collected an unusual variety of interesting small fungi of the Clavaria and Geoglossum types. They were sent to Mr. A. D. Cotton of Kew, who kindly reported on them. The first-mentioned proved to be *Spathularia clavata* Sacc., rare in the British Isles, and with only one previous Irish station (Shankill, Co. Dublin: G. Pim). The others were as follows:—*Clavaria fumosa* Pers., *C. muscoides* L., *C. rugosa* Bull., *C. inaequalis* Fl. Dan., *C. umbrinella* Sacc., *Microglossum viride* Gill (=*Mitrula viridis* Karst.), *Otidea grandis* Massee, *Thelephora spiculosa* Fr. Of these, *C. rugosa* and *C. inaequalis* are on record from each of the four provinces of Ireland; the other three Clavarias were only recently added to the Irish flora in the Clare Island Report; *C. umbrinella* is very rare in the British Isles. *Microglossum viride* has been recorded from the Dublin district. For *Otidea grandis* (a rare species in our islands) the present appears to be the first Irish record. Regarding *Thelephora spiculosa*, the *name* is new to the British list, as is explained

in the following note which has been kindly communicated by Miss Wakefield of the Kew Herbarium :—

"This fungus is not uncommon in Britain, and has been previously recorded under the name *Thelephora mollissima*, Pers. There has been much confusion as to nomenclature in connection with it, and probably *T. mollissima*, Pers., *T. penicillata* (Pers.) and *T. crustacea*, Schum. are synonyms of *T. spiculosa*, Fr. The reasons for adopting the latter name are explained in a note which it is hoped will appear in the next number of the *Transactions* of the British Mycological Society. This plant is somewhat variable, but among British species is readily recognised by its habit. It grows on the ground, spreading over dead leaves wi decumbent or slightly ascending fan-like clusters of branches, or encrusting the base of grasses and other small plants in the same way as *Sebacina incrustans* (Pers.) Tul. The slender cylindrical branches nto which the margin of the sporophore divides have conspicuous whitish fringed tips, from which character the specific name is derived."

The only previous Irish record for *Thelephora spiculosa* appears to be Rademon, Co. Down (Lett, as *S. mollissima*).

R. Lloyd Praeger.

Dublin.

## Elymus arenarius on the North Bull.

In his interesting note in last month's *Irish Naturalist* on the appearance of *Elymus arenarius* on the North Bull Mr. Colgan places the probable date of its introduction after the closing of the Bull to the public in 1914. I can, however, push back the date a few years. In June, 1909, I gathered *Elymus arenarius* on the North Bull on the exact spot described by Mr. Colgan. The specimens are now in the Herbarium of the National Museum. My note-book says there were two patches. I looked for it again early in the following season, but unsuccessfully. However, in the autumn of that same year Miss M'Ardle (now Mrs. Patman) and I came across it again. Shortly afterwards Dr. Pethybridge independently found the grass and brought specimens to the Herbarium. He also reported having seen only two clumps so that the colony seems to be on the increase as Mr. Colgan records four patches. At the time I made some enquiries as to the probable source of origin, and amongst others I wrote to Mr. Campbell to ask if *Elymus arenarius* was grown in the gardens at St. Anne's ? I received a very interesting letter in reply, which I do not think I can do better than quote, since it supplies an explanation of the presence of the grass on the North Bull. Mr. Campbell says "with reference to *Elymus arenarius* I have not got it here, but I think I can tell you how it has appeared on the North Bull. The late Mr. Burbidge for years before his death used to fill his pockets with all sorts of seeds which he thought likely to grow there and on the cliffs at Howth. He told me so himself, and I have no doubt the above is the result."

Matilda C. Knowles.

National Museum, Dublin.

# SOME RECORDS FOR IRISH MYCETOZOA.

BY MARGARET W. REA AND MARGARITA D. STELFOX.

In her report on the Mycetozoa of the Clare Island Survey, Miss G. Lister, F.L.S., included a list of all the species found in Ireland up to that date. Other papers have appeared since giving additional records for the Counties of Kerry,[1] Sligo, Leitrim, Fermanagh and Cavan.[2]

As the result of gatherings made during the last two years we have been able to compile the following list which we think may be of interest to other workers.

We have to thank Miss Lister for her extreme kindness in examining and identifying practically all our material, and Messrs. E. Armstrong, A. M'I. Cleland, Nevin H. Foster, A. W. Stelfox, J. A. S. Stendall and Professor Yapp, for contributing specimens found by them.

The following contractions are used for the names of county divisions:—AN., Antrim; DO., Down; MO., Monaghan; NT., North Tipperary; TY., Tyrone; WD., West Donegal.

Thirteen species which have not been recorded previously from Ireland are marked with an asterisk.

The letter R in brackets following any locality signifies that the specimen was collected by M. W. Rea, and S that the specimen was obtained by M. D. Stelfox, or A. W. Stelfox.

**Ceratiomyxa fruticulosa** Macbride.

AN.—Carnmoney; Colin Glen; Ballycastle (R and S).
DO.—Near Lisburn; Holywood; Newcastle (R). Belvoir Park Belfast; Ballymagee; Carngaver (S).
MO.—Glaslough (R).
TY.—Coalisland (R).
WD.—Near Falcarragh (S).

**Badhamia utricularis** Berkeley.

AN.—Colin Glen (R).
DO.—Near Lisburn; Holywood (R). Belvoir Park; Carngaver (S).

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[1] *Irish Naturalist*, vol. xxiv., pp. 37-39, 1915.
[2] Proceedings Belfast Nat. Field Club, 1914-1915, pp. 160-163.

* **Badhamia foliicola** Lister.

DO.—Ballymagee (S). Saintfield (R).

* **B. nitens** Berkeley.

DO.—Near Lisburn (R).

**B. panicea** Rostafinski.

DO.—Near Lisburn (R).

* **Physarum pulcherripes** Peck.

DO.—Rostrevor (R).

**P. psittacinum** Ditmar.

DO.—Belvoir Park (R).

**P. viride** Persoon.

AN.—Colin Glen (R).

DO.—Holywood (R). Leverogue near Drumbo; Carngaver; Ballymagee (S).

The var. *incanum* Lister has been found at Holywood in the plasmodium stage.

* **P. galbeum** Wingate.

DO.—In a small glen one mile south of Bangor (S).

**P. nutans** Persoon.

AN.—Colin Glen; Ballycastle (R). Ballycastle; Malone House, Belfast (S).

DO.—Holywood; Near Lisburn; Newcastle (R). Hillsborough (N. H. Foster). Portavo; Carngaver; Belvoir Park (S).

The subsp. *leucophaeum* Lister has been found throughout the district in many localities; a form having the lime granules entirely absent has been collected at Portavo.

MO.—Glaslough (R).

TY.—Coalisland (R).

**P. compressum** Albertini & de Schweinitz.

DO.—Ballymagee (S).

NT.—Nenagh (R).

* [**P. vernum** Sommerfelt.

DO.—Leverogue near Drumbo (S).

About a dozen sporangia on moss growing on dead whins have been doubtfully referred by Miss Lister to this species, though she considers they may possibly be a dark-spored form of *P. cinereum* Persoon.]

**Fuligo septica** Gmelin.

AN.—Colin Glen (R). Carr's Glen (S).
DO.—Belvoir Park; Holywood (R). Carngaver; Drumbo (S).
MO.—Glaslough (R).

**Leocarpus fragilis** Rostafinski.

DO.—Carngaver Woods near Bangor (R).

**Didymium difforme** Duby.

DO.—Near Lisburn (R). Ballymagee (S).

* **D. Clavus** Rostafinski.

DO.—Saintfield (R). Ballymagee; Leverogue (S).

**D. melanospermum** Macbride.

DO.—Carngaver near Bangor (S).

**D. nigripes** Fries.

DO.—Saintfield (R). Ballymagee (S.)
The var. *xanthopus* Lister was also collected at Saintfield and near Lisburn (R).

**D. squamulosum** Fries.

AN.—Rungill Glen near Glenoe; near Lough Naroon (S).
DO.—Saintfield and near Lisburn (R). Ballywilliam; near Donaghadee; Ballymagee (S).

**Mucilago spongiosa** Morgan.

DO.—Near Killough (J. A. S. Stendall).

**Stemonitis fusca** Roth.

AN.—Colin Glen; Garron Tower (R). Lagan Valley; Garron Tower (S).
DO.—Hillsborough Park; near Lisburn (R). Carngaver woods (S).
Var. *confluens* Lister has been found in great abundance at Belmont near Belfast, and at Rostrevor, where var. *flaccida* Lister has also been collected (R).
NT.—Nenagh (R).

**S. splendens** Rostafinski.

DO.—Carngaver woods (S).
Var. *Webberi* Lister occurred at Belvoir Park (R).
Var. *flaccida* Lister has been collected at Hillsborough, Belmont and Holywood (R).

**Stemonitis herbatica** Peck.

AN.—Colin Glen (R).
DO.—Belmont (R). Carngaver (S.).

**S. flavogenita** Jahn.

AN.—Colin Glen (R).
DO.—Belvoir Park; Holywood (R).

**S. ferruginea** Ehrenberg.

AN.—Colin Glen (R). Garron Point (S).
DO.—Belvoir Park; Holywood; near Lisburn (R). Portavo; Carngaver woods (S).

**Comatricha nigra** Schroeter.

AN.—Colin Glen; Ballycastle (R). Lagan Valley (S).
DO.—Holywood; near Belfast; Rostrevor (R). Leverogue; Carngaver woods; Ballymagee (S).

The var. *alta* Lister has been collected in Belvoir Park and at Saintfield (R).

TY.—Coalisland (R).

**C. laxa** Rostafinski.

AN.—Ballycastle (R).
DO.—Ballymagee; Carngaver woods (S).

* **C. elegans** Lister.

DO.—Belvoir Park (R). Carngaver woods (S).

[**C. pulchella** Rostafinski.

DO.—Carngaver Woods (S).

The sporangia of the specimen collected were irregularly formed. Miss Lister refers them doubtfully to *C. pulchella* var. *gracilis* Lister.]

**C. typhoides** Rostafinski.

AN.—Colin Glen; Ballycastle (R). Lagan Valley (S).
DO.—Hillsborough; Holywood (R). Ballyholme near Bangor; Carngaver woods (S).

Specimens of the var. *heterospora* Rex have been obtained at Holywood (R) and in Carngaver woods (S).

MO.—Glaslough (R).
NT.—Nenagh (R).

**Enerthenema papillatum** Rostafinski.

AN.—Ballycastle; Colin Glen (R).
DO.—Holywood (R). Leverogue; Ballymagee; Carngaver woods (S).

**Lamproderma echinulatum** Rostafinski.

AN.—Lagan Valley near Belfast (S).

**L. scintillans** Morgan.

DO.—Near Lisburn (R).

**L. columbinum** Rostafinski.

DO.—Carngaver woods (S).

* **Brefeldia maxima** Rostafinski.

AN.—Malone near Belfast (Professor R. H. Yapp).

**Cribraria argillacea** Persoon.

AN.—Colin Glen (R).
DO.—Strickland's Glen near Bangor; Holywood (R). Clandeboye; Carngaver woods (S).
WD.—Near Falcarragh (S).

**C. aurantiaca** Schrader.

AN.—Colin Glen (R).
DO.—Bangor; Holywood (R). Clandeboye; Carngaver woods (S).
WD.—Near Falcarragh (S).

**Dictydium cancellatum** Macbride.

AN.—Colin Glen (R).
DO.—Belvoir Park; Holywood; Rostrevor (R). Carngaver woods; Drumbo (S).
WD.—Near Falcarragh (S).

* **Licea minima** Fries.

DO.—Portavo near Donaghadee; Carngaver woods (S).

**L. flexuosa** Persoon.

DO.—Comber (R). Carngaver woods (S).

**Tubifera ferruginosa** Gmelin.

AN.—Carnmoney near Belfast (R).
DO.—Holywood; Rostrevor (R).

**Enteridium olivaceum** Ehrenberg.

DO.—Ballymagee near Bangor (S).

**Reticularia Lycoperdon** Bullard.

AN.—Ballycastle (R). Glendun; Lagan Valley (S).
DO.—Near Lisburn; Belvoir Park (R). Drumbo; Ballymagee; Bangor (S).

**Lycogala epidendrum** Fries.

AN.—Colin Glen; Ballycastle (R). Lagan Valley (S).
DO.—Near Lisburn; Bangor; Holywood (R). Carngaver woods; Belvoir Park; Hillsborough (S).
TY.—Coalisland (R).

**Trichia affinis** de Bary.

AN.—Colin Glen; Carr's Glen (R). Murlough Bay; Ballycastle; Garron Point; Lagan valley; Glendun (S).
DO.—Belvoir Park; Belmont (R). Hillsborough; Portavo; Carngaver woods (S).
NT.—Nenagh (R).

**T. persimilis** Karsten.

AN.—Malone House near Belfast (S).
DO.—Holywood (R). Portavo; Carngaver woods; Ballymagee (S).

* **T. scabra** Rostafinski.

DO.—Belvoir Park near Belfast (R).

**T. varia** Persoon.

AN.—Colin Glen (R). Lagan Valley (S).
DO.—Belvoir Park; Holywood (R). Belvoir Park; Millisle; Portavo; Carngaver (S).

* **T. contorta** Rostafinski.

AN.—Glenoe near Larne (S).

**T. decipiens** Macbride.

AN.—Colin Glen; Ballycastle (R). Garron Point; Glenoe; Lagan valley (S).
DO.—Belvoir Park; Holywood (R). Hillsborough; Portavo; Carngaver woods; Ballymagee (S).
MO.—Glaslough (R).
WD.—Near Falcarragh (S).

**T. Botrytis** Persoon.

AN.—Colin Glen (R). Garron Point; Ballycastle; Lagan valley (S).
DO.—Comber; Belvoir Park; Holywood (R). Mourne Park near Kilkeel (Nevin H. Foster). Portavo; Carngaver woods; Drumbo Glen (S).

* **Arcyria ferruginea** Sauter.

DO.—Near Donaghadee; Portavo; Carngaver woods (S).
The var. *heterotrichia* Torrend has been collected near Lisburn (R) and near Donaghadee (S).

**Arcyria cinerea** Persoon.

AN.—Colin Glen (R).
DO.—Holywood; Hillsborough (R). Leverogue Glen; Ballymagee; Carngaver woods (S).

* **A. pomiformis** Rostafinski.

AN.—Colin Glen (R).
DO.—Bangor; near Lisburn (R). Near Donaghadee; Ballymagee; Cargaver woods (S).

**A. denudata** Sheldon.

AN.—Colin Glen (R). Lagan valley (S).
DO.—Holywood; Hillsborough (R). Portavo; Clandeboye; Carngaver woods; Ballymagee (S).
MO.—Glaslough (R).
NT.—Nenagh (R).

**A. incarnata** Persoon.

AN.—Colin Glen; Ballycastle (R).
DO.—Near Lisburn; Hillsborough; Belvoir Park (R). Leverogue; Portavo; Ballymagee; Carngaver woods (S.)
The var. *fulgens* Lister occurred at Belvoir Park (R).
MO.—Glaslough (R).

**A. nutans** Greville.

AN.—Colin Glen; Ballycastle (R). Glendun (S).
DO.—Near Lisburn; Hillsborough; Holywood (R). Belvedere near Drumbo; Ballymagee; Carngaver woods (S).

**Perichaena depressa** Libert.

DO.—Near Lisburn (R).

**P. corticalis** Rostafinski.

DO.—Saintfield; near Lisburn (R).
TY.—Coalisland (A. M'I. Cleland).

**Margarita metallica** Lister.

DO.—Carngaver woods; Leverogue (S).

**Prototrichia metallica** Massee.

AN.—Colin Glen (E. Armstrong).
DO.—Leverogue; Portavo; Ballymagee (S.)

As in some cases we have found those species, which are new to the Irish list, in only a few localities, it may not be

out of place to give a short account of some of their habitats, etc.

*Badhamia foliicola* was first collected at Ballymagee where sporangia were found in great profusion covering pieces of whin stick. Much rain had fallen during the first fortnight of August, 1915, and after a few days of fine weather specimens of several species were found on small pieces of sticks lying under whins which were growing on the tops of old earthen ditches. On examination, the sporangia were found to be externally typical of this species, though under the microscope the spores showed a tendency to cluster. However, the colour of the spores was too pale brown for *B. utricularis* with which this species might be confused, and there was no leathery fungus in the neighbourhood on which the plasmodium could have fed.

The specimen procured at Saintfield was on a heap of straw lying under a hedge. The bright orange colour of the plasmodium attracted attention, and when some of it was brought indoors it matured into the grey iridescent sporangia in a couple of days.

*B. nitens.*—On picking up a small much decayed twig in a plantation at Larchfield, near Lisburn, some typical sporangia of this species were discovered: the only ones which we have so far been fortunate enough to find.

*Physarum pulcherripes.*—While searching in a larch plantation in the grounds of Sir John Ross of Bladensburg at Rostrevor a stump attracted our attention, and here a number of the upright buff sporangia were collected. Miss Lister, when returning the specimens, remarked that the colour is less orange-red than usual, the stalks a darker brown, but the lime-knots show the typical form and red colour. This is the first British record for this species, and so far as Miss Lister knows is the first European specimen obtained. Miss Lister also drew our attention to the fact that *P. pulcherripes* is the earliest published name. "Peck afterwards published *pulchripes*, but we must abide by the first."

*P. galbeum.*—A short distance south of Bangor there is a small glen filled for the most part with hazel scrub. Under some bushes a few specimens were found on small decaying stems of *Rosa canina.* The sporangia were quite typical in appearance, being bright yellow, erect and smooth. Under the microscope the dense network of yellow capillitium was clearly visible and the sporangium wall had a wrinkled base which is not always so in this species. On account of the minute size of the sporangia they might easily be overlooked.

*Didymium Clavus.*—The remarks made above concerning the finding of *Badhamia foliicola* at Ballymagee also apply to this species. The sporangia were quite typical and in good condition. The sporangia collected at the Leverogue were rather over-ripe. They occurred on small branches of dead bramble which were lying under some whin bushes.

Near Saintfield a small quantity was discovered on straw in an open field together with specimens of *D. nigripes* and *D. squamulosum.*

*Stemonitis splendens.*—In the Clare Island Survey, Mycetozoa, pp. 16-17, Miss Lister notes that all the gatherings of this species so far recorded from Ireland belong to the var. *Webberi*, the typical form not having been found in the British Isles. We have been fortunate enough to find the type and var. *Webberi* at Carngaver, while the var. *flaccida* proved common.

*Comatricha elegans* seems to occur very locally. Specimens were collected at Carngaver in the months of August, September and January. All occurred on pine logs. The material procured there and in Belvoir Park was quite typical and could be referred with certainty to this species. The gathering obtained in September at Carngaver is interesting, as though the character of the branching of the columella and capillitium undoubtedly made it *C. elegans*, the pinkish lilac colour is quite unlike usual gatherings, and Miss Lister suggests it is almost worthy of being named a distinct variety.

*Brefeldia maxima.*—The plasmodium of this species was found on the stump of a lime-tree. Brought indoors, some difficulty was experienced in ripening it satisfactorily, as mould appeared in a few days. In consequence it had to be dried hurriedly, but, as Miss Lister remarked, the component sporangia stood up, showing their individuality better than they would in a perfectly mature specimen.

*Licea minima.*—No British record of this species has been previously published, which is no doubt due to the fact that the sporangia are so minute in size that they may be easily overlooked in the field. Specimens were discovered by us on a piece of wood at Carngaver, while, simultaneously Miss Lister identified some on a piece of wood we had sent with sporangia of *Arcyria cinerea* from Portavo.

*Trichia contorta.*—Sporangia were abundant on small twigs—principally ash—which were lying in heaps at the foot of Rungill Glen, Glenoe, in the month of December.

*Arcyria ferruginea.*—This easily recognised species is no doubt more common than our records would suggest. One specimen was found on a discarded gate-post lying partly under a hedge on the golf links at Donaghadee, while others were found in a small plantation and in woods.

*A. pomiformis.*—It is a matter for surprise that no records have appeared for this species before this, as we found it to be fairly common on decaying branches and sticks lying among grass

Ballymagee, Bangor.

# USEFUL STUDIES FOR FIELD NATURALISTS.

BY PROFESSOR GEO. H. CARPENTER, M.SC., M.R.I.A.

(Presidential Address to the Dublin Naturalists' Field Club, December 14, 1916.)

It happened lately that I looked into a book well known to students of the history of Irish zoology—the Rev. John Keogh's "Zoologia Medicinalis Hibernica," published in 1739. This curious work illustrates well the connection, in pre-Linnean days, between systematic natural history and medical practice, so that botanical and zoological classifications arose largely as a necessary aid to the physician. A sentence from Keogh's preface should find an echo in the minds of members of this Club :—

"I think, there ought to be encouragement given, in order to improve and cultivate the three Branches of the *Materia Medica*, which are *Botanologia*, *Zoologia*, and *Mineralogia*, they being so very useful for the Preservation of Health, I could heartily wish our Doctors took more notice of them in their Practice, then so many Patients would not expire under their hands."

Perhaps, however, we may be thankful that the medical men of the present century do not habitually follow Keogh's zoological prescriptions. It is interesting to an entomologist to learn that "the spirit extracted from Ants causes Magnanimity or Greatness of Mind," that "Butterflies reduced into Powder, and mixt with Honey cure Baldness, being externally applied," and that Caterpillars "being burnt and put into the Nostrils stop bleeding." The Crane is now unfortunately unknown in Ireland except in our Zoological Gardens, but in Keogh's days the bird would have been appropriate to an occasion like the present when members of a club are assembled to hear an address. The speaker might have been helped, because "a Broth made of the Flesh clears the Voice"; he would not share his broth with the audience, but would let them know that the Gall "dropt into the Ears with oil of Amber, cures Deafness."

This evening the President cannot improve his voice or the members their powers of hearing with these applications, but we can all recognize that Keogh's interest in zoology was largely utilitarian, and it may be instructive for us to trace the connection of some economic applications of natural history with the cultivation of the science for the sake of the interest and fascination which it has for us. People often talk and write of "pure" and "applied" science; but as Huxley taught us long ago there are not two kinds of science but one. It may be desirable to enter a protest against two points of view both inimical to the advancement of science among our people: firstly, the supercilious outlook of some "pure scientists" who affect to believe that a discovery is somehow degraded if it become useful to mankind; and secondly, the intolerant attitude of some "practical men" who would discourage any line of research that cannot be clearly directed to an economic issue. As a matter of fact enquiries undertaken—like Keogh's—for the sake of medicine or agriculture, often yield results of high theoretical importance, while there is no line of biological research that may not at some time contribute to the preservation of human health or to the advancement of human industry.

The last twenty years have been noteworthy for a remarkable advance in our knowledge of the parasitic Protozoa, such as the Haemosporidia and the Haemoflagellata. The researches that led to these discoveries were undertaken by medical men who worked at the life-histories of the protozoan parasites in order that they might be the better able to prevent or relieve disease in man and domestic animals. In such practical results the investigations have proved abundantly fruitful, but how impressive also has been the progress of zoological science associated with them, as illustrated for example by the elucidation of a true sexual reproduction among the Protozoa and of the adaptation of these minute parasites for a life in two alternate hosts—the vertebrate and the blood-sucking gnat or tick.

Some time ago I gave before this Club an account of the progress made in an investigation into the life-history of the Ox Warble-flies—an investigation with a definitely

economic bearing. Yet it has well justified Prof. Miall's remark that the transformations of insects of agricultural importance are fully as interesting as those of any other insects. The first stage larva of Hypoderma[1] with its relatively immense mouth-hooks and strong spiny armature, adapted for boring through the skin of cattle, differs so markedly from the smooth second-stage maggot found in the gullet-wall that the life-history might be regarded as approaching the hypermetamorphosis that characterises some Coleoptera. In the latter order besides the oft-quoted cases of larval differentiation among the Meloidae it is well to recall the less marked but highly interesting instances afforded by the Bruchidae—a family of economic importance on account of the injury done by them to peas and beans. Here, as Riley and Howard have shown,[2] there is a first-stage larva, provided with legs and a pronotal spiny process, which bores its way through the pod and enters the developing seed within which the legless grubs of the later stages feed.

During my previous Presidency of this Club, more than twenty years ago, my visit with some of the members to the Mitchelstown Cave led me first to take an interest in those lowly wingless insects, the springtails or Collembola, several blind species of which are included in our Irish cave fauna. At that time beyond a few observations there was nothing to show that the insects had any economic importance, and the severely practical man might have thought that an entomologist, in devoting days and months to their systematic study, was hopelessly wasting his time. During the present century, however, it has been found both in Ireland[3] and in Britain[4] that several kinds of Springtails are very harmful to roots and other underground plant structures, to fallen fruit, and to foliage. It is reasonable to suppose that the comparatively sudden rise of the Collembola to importance as injurious insects is not due to

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[1]*See* Carpenter and Hewitt, *Irish Nat.* vol. xxiii., 1914, pp. 214-221. and *Sci. Proc., R. Dublin Soc.*, vol. xiv., 1914, pp. 268-290.

[2]*Insect Life*, vol. iv., 1892, pp. 297-302.

[3]Carpenter, *Econ. Proc., R. Dublin Soc.*, vol. i. (1904, pp. 251-3).

[4]Theobold, " Report on Economic Entomology for 1910 " (pp. 111-127)

want of observation in former years, but to an actual change in the mode of life of the species observed. Thus the study of an obscure group of insects is found to have an unexpected economic bearing, and the behaviour of the creatures in relation to cultivated plants may give the naturalist an opportunity of noticing change of habit on a large scale —a fascinating line of enquiry from the biological point of view.

In the case of one springtail, at any rate, such a change of habit has been certainly observed. Tobacco is a newly introduced crop in Ireland, raised entirely from seed, so that no insect-pests can have been introduced with it. In April, 1907, tobacco seedlings from Kilkenny were found to be covered with multitudes of dark greyish springtails, which proved on examination to belong to *Isotoma tenella*, a Finnish and North German species hitherto unrecognised in the British Islands.[1] There can be no doubt that this scarce insect had suddenly increased in numbers through the introduction of a new crop which happened to afford a large and suitable food-supply.

It is interesting to notice also that the tobacco grown in Ireland has attracted several of our common and always abundant farm-pests such as wireworms (Agriotes larvae), and caterpillars of the Cabbage Moth (*Mamestra brassicae*) and of its ally *M. oleracea*, as well as the familiar "surface caterpillars" of the Turnip Moth (*Agrotis segetum*).

Many years ago I received from a Westmeath farm a number of root-eating beetle-larvae which none of my friends, specialists in the Coleoptera, were able to identify. In February, 1908, the same larvae turned up again—injurious to roots of oats and grasses in Co. Dublin. On this occasion I succeeded in rearing a beetle which proved to be the common *Dascillus cervinus*;[2] then I learned that similar observations on the habits of the larva had been made in Denmark by Prof. J. E. V. Boas,[3] and that some description of its structure had been given by Dr. C. J.

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[1]See *Irish Naturalist*, vol. xvii., 1908 (pp. 174-6) and *Econ. Proc. R. Dublin Soc.*, voi. i. (1908, pp. 574-6).

[2]*Econ. Proc., R. Dublin Soc.*, vol. i. (1909, pp. 589-592).

[3]*Tidsskift for Landbrugets Planteavl*, vols. iii. x., 1896-1903.

Gahan.[1] The maxilla of the Dascillus grub is strikingly like that of the adult, showing none of the secondary simplification in that appendage which characterises beetle-larvae as a rule. It seemed therefore that a detailed study of the jaws might be profitable. The result was the establishment of the presence of maxillulae, comparable to those of the Apterygota and of mayfly-larvae, in the larval Dascillus and also in the curious little woodlouse-like larva of the sub-aquatic Helodes which belongs to the same family.[2] Here then was a discovery of some importance to the student of insect morphology made as a bye-product of an ordinary agricultural enquiry—another illustration of the beneficial action and reaction of the "pure" and the "applied" aspects of natural science.

I have ventured to bring these rather discursive reminiscences before the Club, because they illustrate how frequently studies which the naturalist pursues for the love of them may turn out to be useful in the economic sense; how frequently too a piece of work undertaken for the sake of medicine or agriculture may lead the investigator into paths of high theoretical interest. From either point of view they may truly be hailed as "useful" studies for field naturalists.

Royal College of Science, Dublin.

# IRISH SOCIETIES.

## DUBLIN MICROSCOPICAL CLUB.

February 14.—The Club met at Leinster House. N. Colgan, M.R.I.A. (President) exhibited a series of slides illustrating variation in the form of orchid seeds. The series included, along with the seeds of native orchids, those of many hybrids and exotic species which Sir Frederick Moore had kindly procured for the exhibitor from the famous orchid specialists, Messrs. Charlesworth and Messrs. Sander and Sons. Much variation in the percentage of perfect seeds was apparent in the specimens shown, some of the hybrids being perfectly fertile, while accepted species showed either absolute infertility or a degree of fertility as low as 10 per cent.

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[1] *Trans. Ent. Soc.*, 1908, pp. 275-282, pl. vi.

[2] Carpenter and MacDowell, *Quart. Journ. Microsc. Sci.*, vol. lvii., 1912, pp. 373-396.

The most characteristic amongst the forms of seed-coat shown were those of *Disa grandiflora* and of an undetermined species collected in New Caledonia by the representative in New Guinea of Cambridge University. In this undetermined species the diaphanous, netted seed-coat was peculiarly attenuated, the length being more than ten times the breadth. Three out of the four New Caledonia orchids, of which mounted seed specimens were kindly lent by Messrs. Charlesworth, proved to be quite barren. They had evidently not been favoured with the insect visit necessary to ensure fertilisation.

Sir F. W. Moore exhibited sections of two-year-old wood of *Pyrus floribunda* var. *purpurea.* In this variety the leaves are dark red in colour, and the bark is also very dark. The colouring matter is in the cells of the outer layers of the cortex, and in the medullary rays in the one-year-old wood. It does not extend to the cells of fibro-vascular bundles. In older parts of the stem and branches the coloured sap was more generally diffused through the tissues.

Dr. G. H. Pethybridge exhibited the smut fungus *Tilletia laevis* Kühn, obtained from a sample of seed wheat from Birr in King's County. Although "stinking smut" or "bunt" of wheat is not uncommon in Ireland this is the first time that *T. laevis* has been observed to be the cause of it here, *T. tritici* being much more common. The spores of *T. laevis* are quite smooth-walled and are not so spherical as those of *T. tritici.* The life histories of the two parasites are quite similar.

# NOTES.

## A new Science Club.

In February the inaugural meeting was held of a new Club in Dublin whose special object is the discussion of biological problems in a wide sense. The meetings of the Club are intended to be of a very informal character, being devoted to open discussion of selected subjects, exhibits which involve some problem or some novelty, and occasional discourses on the present state of our knowledge in branches of science. Papers in the ordinary sense are barred. The membership is limited to 50, and only persons actually engaged in science research or science teaching are eligible. The affairs of the Club are controlled by a committee of three (for the present year Messrs. Southern, Hallissy and Praeger), and a chairman is elected for each meeting. At the inaugural meeting on Feburary 5, after formal business, R. Southern opened a discussion on the geological and biological features of Lough Hyne, Co. Cork, and on March 5 Prof. R. A. S. Macalister brought forward the subject of the chronology of early man. The members who took part in the discussions which ensued included Profs. G. H. Carpenter, A. F. Dixon, A. Henry, J. A. M'Clelland, E. J. M'Weeney, E. A. Mettam, H. J. Seymour, and J. Wilson, Sir F. W. Moore, Drs. W. E. Adeney, F. E. Hackett, J. R. D. Holtby, G. H. Pethybridge and J. T. Wigham; Messrs. N. Colgan, T. Hallissy, A. C. Forbes, J. de W. Hinch, R. Ll. Praeger, W. B. Wright.

## BOTANY.

### Foxgloves Killed by Cold.

An unexpected effect in my garden of the very cold February through which we this year passed has been the complete killing of numbers of healthy self-sown one-year-old plants of Foxgloves. I put it down to the fact that they were growing more in the open than they do in wild situations, but a recent visit to Aughrim in Co. Wicklow, showed that there Foxgloves had in many instances been killed even in partial shelter, while even on hedge-banks under trees all the larger leaves were dead, and only the heart displayed signs of life. This tenderness to cold would hardly be expected in a plant which ranges across Central Europe, and northward into Scandinavia.

R. Lloyd Praeger.

Dublin.

## ZOOLOGY.

### Unusual Flight of a Kingfisher.

Some twelve months ago, near the River Dodder on the south side of Dublin, my wife and I heard a note which she identified as that of a Kingfisher, proceeding from a bird which was flying in wide sweeps so high over our heads as to be little more than a speck. After performing these evolutions for a while, uttering its note at intervals, the bird descended till it passed close to us, and its identity as a Kingfisher was duly established. Several ornithologists of whom I enquired having said they have not observed such lofty flights on the part of a Kingfisher, undertaken apparently without specific purpose, I venture to publish this observation.

R. Lloyd Praeger.

Dublin.

### Night Heron near Dublin.

In Easter week, 1916, a Night Heron (*Nycticorax griseus*) appeared at Bushy Park, Terenure, and remained till September. It was not at all wild, and could easily be watched with glasses. It generally perched by day on a willow tree close to the pond, but at night it was always moving about and flying round. Between 8 and 10 p.m. it generally flew, uttering a peculiar note rather like the Common Heron, but yet quite distinct from the latter. It seemed a young bird, as the breast and back were mottled to a certain extent, the plumage being intermediate between that of the two mounted specimens in the National Museum. I am informed that the last occurrence of this bird was in 1882 in the Rathgar quarry, only a mile away.

Frederick W. Shaw.

Bushy Park, Terenure.


Mosses and Hepatics of Glen of the Downs.

*To face p.* 73.

# THE MUSCI AND HEPATICAE OF THE GLEN OF THE DOWNS, CO. WICKLOW.

BY DAVID M'ARDLE.

(PLATES I. II.)

(Read before the Royal Irish Academy, January 8, 1917).

The Glen of the Downs lies in the north-east corner of Co. Wicklow, five miles due south of Bray, and two and a half miles from the nearest sea at Greystones. It is a glacial "dry gap," a mile in length and about 400 feet in depth, cut through a low ridge, some 700 feet high, formed of the Cambrian slates of the neighbourhood. West of the glen at a distance of about a mile, the ground rises to over 1,200 feet. Some miles further west rise the high granite hills of the main Wicklow chain. The sides of the glen are steep, with large detached masses of rock resting in places on the slopes. The bottom has a gentle slope towards the south-east, and is occupied by an insignificant stream, and also by the main road from Dublin to the south. The glen is densely wooded, the trees selected evidently with a view to develop autumn tints, and the colours of the foliage are then worth going to see. Some very fine specimens of the Sessile-flowered Oak, with *Pyrus Aucuparia*, Alder, Larch and Abies, Pinus, Ash and Horse Chestnut occur. The conifers attain large dimensions.

The Glen of the Downs has been better known as a pleasure resort than as the haunt of the cryptogamic botanist, previous records of Mosses or Liverworts from it being very few. This was the place selected by the members of the Dublin Microscopical Club for their annual excursion in June, 1911; the day was wet and stormy, and little collecting was done; Messrs. Allen and Gunn agreed with me to return in more favourable weather and investigate the Musci and Hepaticae; we visited it in the following August, and the result of our collecting was so encouraging that we have paid several visits through the following years, 1912-13-14, always finding some Mosses or Hepaticae of

interest. In this way we have collected 81 species, varieties, and forms of Mosses, some of which are very rare. *Hypnum cupressiforme* var. *minus* Wils. is an addition to the Irish flora. Eleven (marked *) are new to Co. Wicklow, according to the list of the Mosses of Ireland, by Canon Lett, 1915. Other species although previously recorded from Wicklow have not been found there for many years. I may instance *Webera cruda* and *W. albicans*. Both were found at Lough Bray more than half a century ago ; it is interesting to have verified such old county records.

In our work of collecting we found some of the mosses very attractive ; *Hypnum cupressiforme* var. *tectorum* grew both on rocks and on the trunks of trees, in dense velvety cushions of a dark olive-green colour, and the moist bank of a drain was covered with the bladder-moss *Physcomitrium pyriforme*, the dark red fruit-stalks contrasting with the green foliage. In the stream the water-moss *Fontinalis antipyretica* flourished, and growing with it a form of *Eurhynchium rusciforme* attached to stones. I have not previously found this plant affecting a purely aquatic habit. On wet rocks we gathered Milde's var. *fallax* of *Heterocladium heteropterum*, very distinct-looking and much restricted in its distribution in Ireland. On peaty banks *Tetraphis pellucida* flourished, bearing gemmiferous cups and also fruit ; from copious material we were able to examine the curious frondiform protonema (Plate I fig. 1) microphotographed by Mr. Gunn ; on account of its fugacious habit it is rarely seen.

On the branches of Alder and Oak *Ulota crispa* var. *intermedia* was plentiful, a rare plant in this part of Ireland. *Orthotrichum Lyellii* presents a good example of the asexual mode of reproduction in these curious plants ; in the microphotograph by Mr. Gunn (Plate I fig. 2*a*), it will be observed that the leaves are furnished with reddish-brown gemmae. Of others belonging to this group which bear similar gemmae we may mention *Ulota phyllantha*, which though widely distributed in this country has only once been found in fruit ; in this, the upper portion of the leaves, notably the tips of the younger ones, bear copious brown gemmae, which are a help in the identification of the plant ; it has only

recently been found in fruit in the south of England and in several North American stations; it grows luxuriantly at the highest limit of vegetation on Chimborazo, and frequently near sea-level in our own country. *Plagiothecium elegans* we found growing in dense patches of a shining green colour, remarkably proliferous; I have not previously found specimens of this moss showing the asexual mode of reproduction so well as in this glen, and we were able to trace the various stages of growth to the leafy axis and shoots having root-hairs; most of these adventitious shoots under favourable conditions become perfect plants which may bear the sexual mode of reproduction in their life-cycle. This mode of adventitious branching has been delineated by Mr. W. N. Allen in Plate II, drawn from specimens collected in the glen. We found on examination that these branches or ramuli are not always deciduous, but remain on the stem until it decays, and are then furnished with leaves and root-hairs and are enabled to carry on an independent existence, nourished by the detritus of the parent plants, hence the moss is found growing in smooth close patches of neat strata. *Leucobryum glaucum* is common in this glen. The apical leaves often produce at their tips root-hairs and develop tufts of minute plants, which fall off and, nourished by the old decaying plants, flourish; this goes on year after year until large masses are produced in which, when divided, the annual growths can be traced. These are a few familiar instances of mosses known to reproduce themselves by this curious mode of adventitious budding.

We collected 35 species and varieties of Hepaticae or Scale-mosses, 6 of which are additions to Co. Wicklow. They have been checked off by MacVicar's "Census Catalogue of British Hepatics," 1905. As in the mosses, the additions are marked thus *; Pearson's "Hepaticae of the British Islands" has also been consulted. Among them we were fortunate in finding *Prionolobus Turneri* (Hook.), on a sloping sandy bank in fruit, at about 700 feet. It is one of the rarest and most curious of the leafy group, possessing characters bordering on several sub-genera.

The first notice of the plant in Ireland is in Hooker's "British Jungermanniae" (where there is an excellent figure and description at tab. 29) :—"Found on a shady bank of a mountain rivulet, near Bantry, Co. Cork, by Miss Hutchins." The date of Miss Hutchins' collecting would be about 1811. The plant was not refound in Ireland for sixty-two years, when Professor Lindberg of Helsingfors found a small quantity on a wet sandy bank at Cromaglaun, Killarney, in 1873 ; and now again it has been found by myself in a new station luxuriating in Co. Wicklow, in October, 1912, after an interval of thirty-nine years. In England it is rare, and has been reported from nine counties ; in Wales from Dolgelly ; also from Guernsey, France, the Canary Islands, N. Africa ; and I have specimens collected in the coast counties of California.

We were also fortunate in finding *Pedinophyllum interruptum* (Nees), which was not previously recorded from Co. Wicklow. It is sub-alpine and is found on the Ben Bulben range about Gleniff, Co. Leitrim ; also at Ballyvaughan, Co. Clare ; we were surprised to find it so low as about 300 feet above sea-level.

The most remarkable instance of a rather alpine genus growing at a very low elevation which occurs in Ireland among the liverworts, is to be found in *Clasmatocolea cuneifolia* (Hook.) (Plate III fig. 4), which grows near the summit of Brandon, Co. Kerry, at about 3,000 feet and also luxuriates in the valley near Lough Duff on damp rocks with *Frullania Tamarisci* at about 400 feet above sea level. I remember with what interest the late Dr. Spruce received these specimens, some of which I sent him when I first began to study these curious plants. In his splendid work on the Hepaticae of the Amazon and Andes, page 440, he refers to the plant :—"I cannot doubt that the Irish *Jungermania cuneifolia* Hook. Brit. Jung., t. 64, hitherto known only from sterile specimens, is a true Clasmatocolea. Specimens gathered on Mt. Brandon by McArdle are so like the arcuate barren shoots of *C. fragillima* that until I compared them closely I thought them the same. The Irish plant like the Andine has both entire and bifid underleaves."

In our work of collecting we noted with interest the number of genera which grow together for their mutual support; from one patch on the table of a dissecting microscope we found *Frullania Tamarisci, Lophocolea cuspidata, Lepidozia reptans, Scapania nemorosa, S. gracilis, Diplophyllum albicans, Cephalozia lunulaefolia, C. bicuspidata* and a moss, *Mnium punctatum.* These were with difficulty separated, so closely were they interwoven. The curious cucullate or saccate lobules on the leaves of *Frullania Tamarisci* were unusually large and well developed in rock specimens in this glen. They hold water, and it is remarkable that in places where there is constant moisture, or water trickling over the place where the plant grows, these water-holders become smaller; when constantly submerged they become almost rudimentary.

We found several specimens showing the asexual mode of reproduction by budding which is more frequently seen than in the mosses; the subject has been fully discussed from my own observations in *Irish Naturalist,* Vol. IV., p. 81, pl. 3, 1895.

My best thanks are due to Mr. H. N. Dixon of Northampton, whom I consulted in matters of doubt relating to mosses. These lists would not be so extensive were it not for the help rendered by Mr. W. F. Gunn, of Dublin.

## MUSCI.

**Tetraphis pellucida** Hedwig.—Plentiful in fruit on turfy banks and on decayed wood up to 700 feet. Dissected capsules show the possible origin of the peristome, composed of four solid conical teeth, derived from the fission of the whole cellular tissue of the interior of the operculum or lid; they mark a very primitive stage in that organ, so highly developed in other mosses. Plate I., Fig. 1., shows a microphotograph of the protonema with the frondiform leaves which appear on the first development of the moss stem. They are ovate-spathulate from a narrow base; at first they are often ligulate; they disappear before the development of the moss stem is completed, and are rarely seen for this reason.

**Catharinea undulata** Web. & Mohr.—On shady clay banks up to 700 feet; not common.

**Polytrichum aloides** Hedwig.—On dry ditch banks; plentiful.

**P. urnigerum** L.—On dry ditch banks; frequent.

**P. gracile** Dicks.—Peaty bank at 500 feet; rare in this station.

**P. formosum** Hedwig.—Dry banks in wood.

**P. commune** L.—Wet boggy places and peaty banks.

**Ditrichum homomallum** Hampe.—Clay and peaty banks among rocks at 700 feet; rare.

**Dicranella heteromalla** Schp.—Clay and peaty banks; very common.

***D. Schreberi** Schp.—Clay bank near a stream.

**D. varia** Schp.—Clay and peaty banks; frequent.

**Campylopus flexuosus** Brid.—Peaty ground. A curious robust form.

**C. fragilis** B. & S.—Peaty banks; frequent.

**Dicranum scoparium** Hedwig.—Rocks and decayed wood.

**Leucobryum glaucum** Schp.—Turfy ground in large masses; plentiful at 700 feet.

**Fissidens bryoides** Hedwig.—Ditch banks; plentiful.

**F. taxifolius** Hedwig.—Clay banks; frequent.

**Ptychomitrium polyphyllum** Furn.—Rocks at 700 feet; plentiful. A curious depauperated form is found here with the setae and capsule very unlike the type.

**Tortula muralis** Hedwig.—Roadside wall; common.

**T. subulata** Hedwig.—Roadside wall.

**T. laevipila** Schwgr.—Trunks of trees and decayed wood.

**Barbula fallax** Hedwig.—Peaty and clay banks; frequent.

**B. convoluta** Hedwig.—Clay banks at 700 feet. Var. **sardoa** B. & S.—Very rare.

**Ulota crispa** Brid.—Trunks and branches of trees, frequent from 500 feet upwards. *Var. **intermedia** Schp.—The trunks and branches of trees up to 700 feet; rare. This well-marked variety has previously been found in Ireland in Tyrone, Down, Mayo, and Antrim.

**Orthotrichum leiocarpum** B. & S.—Lower branches of trees at the extreme ends; frequent.

**O. Lyellii** Hook. & Tayl.—Trunks and branches of Oak at 700 feet. The leaves bristled with adventitious buds, some of which were well developed and branched; these were known to the old bryologists as *Conferva Orthotrichi*. Under favourable conditions they produce young plants with leafy stems, which in their further development may bear either male or female fruit, or revert again to the asexual mode and so carry on the life-history. The plant is rarely found fruiting. It is remarkable that this moss is in America almost always without the brown septate gemmae so characteristic of the British plant. (Plate I., fig. 2*a*).

**O. affine** Schrad.—Trunks of trees; frequent. Var. **fastigiatum** Hubn.—Trunks of trees and stones by the stream; rare.

**Physcomitrium pyriforme** Brid.—Ditch banks; plentiful.

**Funaria hygrometrica** Sibth.—Ditch banks and burnt peaty ground.

**Webera cruda** Schwgr.—Moist rocks at 700 feet; very rare.


PLAGIOTHECIUM ELEGANS.

*To face p. 79.* *W. N. Allen, del.*

**Webera albicans** Schp.—Rare on clay banks of the stream, where it grows in large soft loose tufts 1 to 3 inches high, pale white or glaucous green.

**Bryum capillare** L.—Roadside wall; common.

* **Mnium cuspidatum** Hedw.—Peaty banks; frequent.

**M. undulatum** L.—Ditch banks; plentiful.

**M. hornum** L.—Trunks of trees near the ground, and ditch banks; plentiful. A slender lax form grows on peaty banks, not fertile, very distinct.

**M. punctatum** L.—Among mosses in rocky places.

**M. rostratum** Schrad.—Shady banks at 700 feet.

**Fontinalis antipyretica** L.—In the stream, plentiful.

**Neckera complanata** Hubn.—Trunks of trees and decayed wood; common.

**Porotrichum alopecurum** Mitt.—Stones in damp places, very fine, with long dendroid stems.

**Heterocladium heteropterum** B. & S.—Wet rocks; rare. *Var. **fallax** Milde.—Wet rocks at 500 feet, rare.

**Thuidium tamariscinum** B. & S.—Damp bank with *Diplophyllum albicans.*

**Isothecium myurum** Brid.—Trunks of trees, in large bright yellowish-green patches; frequent.

**Pleuropus sericeus** Dixon.—Roadside wall.

**Brachythecium rutabulum** B. & S.—Stones about the roots of trees; common.

***B. velutinum** B. & S.—Roots of trees; frequent.

**B. populeum** B. & S.—Damp sandy ground; common.

**B. plumosum** B. & S.—Decayed stumps of trees, and stones often submerged; frequent.

**B. purum** Dixon.—Banks in the wood; very common.

**Eurhynchium crassinervium** B. & S.—Rocks and stony ground; rare.

**E. praelongum** B. & S.—Banks, old wood and damp ground; frequent. Var. **Stokesii** (Turn.)—Moist places about the roots of trees.

***E. Swartzii** Hobk.—Damp banks among rocks; not common.

**E. pumilum** Schp.—Damp ground among rocks, growing in tufts of neat strata; rare.

**E. myosuroides** Schp.—Trunks of trees and stones. A form with remarkable fine leaf-points, and another very slender one, with delicate branches, almost filiform, occurred very sparingly on dry rocky banks at 700 feet.

**E. rusciforme** Milde.—Wet rocks; frequent. *A form occurred attached to stones in a rivulet with *Fontinalis antipyretica.* It is not usual to find the plant with aquatic habit and aquatic associates.

**E. confertum** Milde.—On old wood; frequent.

**Plagiothecium elegans** Sull.—On the ground in the wood on the east side; plentiful at 300 to 500 feet, very fine specimens. (Plate II).

**P. sylvaticum** B. & S.—On the ground; frequent.

**P. undulatum** B. & S.—On the ground among trees, very fine specimens growing in large patches; conspicuous on the slopes up to 600 feet by its pale silky colour; it presents the appearance of a Neckera.

**Amblystegium serpens** B. & S.—Damp banks; frequent.

**Hypnum uncinatum** Hedwig.—Wet rocks; rare here.

**H. cupressiforme** L.—Trunks of trees and rocks. Var. **resupinatum** Schp.—Rocks and trunks of trees, rare. *Var. **filiforme** Brid.—Trunks of trees; frequent. *Var. **minus** Wils.—Trunks of trees, very rare. Not previously recorded from Ireland. *Var. **ericetorum** B. & S.—On old wood, and trunks of trees; rare. Var. **tectorum** Brid.—Trunks of trees and rocks; rare.

**H. cuspidatum** L.—Marshy places, side of a stream where it is often submerged; frequent.

**Hylocomium splendens** B. & S.—Banks in wood; common.

**H. squarrosum** B. & S.—Damp ground, etc.; common.

**H. triquetrum** B. & S.—Shaded banks and old wood; plentiful.

## HEPATICAE.

**Conocephalus conicus** (L.) Dum.—Swampy ground, and on banks of a stream up to 700 feet; common.

**Lunularia cruciata** (L.) Dum.—Roadside and base of roadside wall; plentiful.

**Metzgeria furcata** (L.) Lindb.—Trunks of trees and among mosses on damp banks and rocks; common. *Form **prolifera**.—Damp banks; rare.

**M. conjugata** Lindb.—Trunks of trees, fertile.

**Pellia endiviaefolia** (Dicks.) Dum.—Ditch banks; plentiful.

**P. epiphylla** (L.) Dum.—Banks of stream and marshy places; common.

**Nardia scalaris** (Schrad.) Gray.—Damp banks; common.

**Plagiochila spinulosa** (Dicks.) Dum.—On old wood; frequent. *Var. **inermis** Carr.—Banks and stones; rare.

**P. asplenioides** (L.) Dum.—Rocks and banks; frequent. *Var. **Dillenii** (Tayl.)—In dense cushion-like tufts about the roots of trees; rare.

***Pedinophyllum interruptum** (Nees) Lindb.—Wet rocks, very rare, at a very low elevation (under 300 feet).

**Lophocolea bidentata** (L.) Dum.—Banks and old wood; common.

***L. cuspidata** Limpr.—Decayed wood.

**Cephalozia catenulata** Huben.—Decayed moss and wood; rare.

**C. bicuspidata** (L.) Dum.—Damp banks and old wood; common.

***C. lunulaefolia** Dum.—Decayed wood; frequent.

***Prionolobus Turneri** (Hook.) Schffn.—Ditch bank at 700 feet. Very rare.

**Kantia trichomanis** (L.) Gray.—Banks and old wood; common.

**K. arguta** (Nees et Mont.) Lindb.—Damp clay bank; rare.

**Lepidozia reptans** (L.) Dum.—On the ground and on old wood; plentiful at 500 feet.

**Trichocolea tomentella** (Ehrh.) Dum.—Abundant along the banks of the stream.

**Diplophyllum albicans** (L.) Dum.—Damp banks and trunks of trees near the ground; very common.

**Scapania resupinata** (Linn.) Dumort.—Rocks, banks and trunks of trees; common.

**S. nemorosa** (L.) Dum.—Damp shaded banks among rocks and about the roots of trees; frequent.

**Radula complanata** (L.) Dum.—Trunks of trees; common.

**Madotheca platyphylla** (L.) Dum.—With *Metzgeria furcata* on damp rocks.

**Lejeunea cavifolia** (Ehrh.) Lindb.—Trunks of trees, among mosses on damp banks and on stones; common.

The specimens from this locality are very distinct, larger than the type, yellowish, very ramose, intricate and fragile. Leaves closely imbricate; antical lobe obliquely broadly ovate-oval, very obtuse; apex distinctly narrower but never acute, entire; postical lobe 3-5 times smaller; cells very chlorophyllose and thickened; trigones distinct; stipules sub-adpressed, obtuse, larger than the postical lobe, and four times as broad as the stem, convex oval-rotund. Monoecious, perianth narrow at the base, oval pyriform, upper 4th part 5-plicate; antheridia singly in amentae formed of one to three pairs of altered leaves.

In the hope of finding some American species like it I sent specimens to Professor A. Evans of Yale University; he compared the plant with American and other specimens, and writes:—"I have "studied the Lejeunea you sent me some time ago with a great deal "of interest. It seems to me, however, that it represents a form of "*cavifolia* Ehrh. (*L. serpyllifolia* Libert). As this species grows with "us it is exceedingly variable, and I have studied specimens in "which the leaves are similar to those in your material. It certainly "presents a very different appearance from the forms growing on "shaded rocks, and yet there seems to be no sharp distinction be-"tween." Professor Kaalaas, of Christiania, who also examined specimens of the Co. Wicklow plant, says "there is no essential "difference between them and specimens from various parts of "Norway," and he considers the difference too slight to separate it from *L. cavifolia*. It is the most distinct form of *L. cavifolia* I have met with, in the imbricated decidedly ovate leaves and large stipules four times as broad as the stem. I observed in the mature perianths coloured chlorophyllous cells such as we find in *L. Holtii*. In the young growth the stem is strong and the leaves distant arranged in a distinct spiral, and furnished with bundles of root-hairs with well marked haustoria; the spiral arrangement is less observable in mature specimens.

Var. **heterophylla** Carr.—On *Frullania dilatata* on the trunks of trees; rare.

**Frullania tamarisci** (L.) Dum.—Rocks, and trunks of trees; common.

Var. **robusta** Lindberg.—Moist rocks; rare.

**F. fragilifolia** Taylor.—Trunks of trees; rare.

**F. germana** Taylor.—On old wood; rare.

**F. dilatata** (L.( Dum.—Trunks of trees, in fruit; frequent.

Royal Botanic Gardens, Glasnevin.

EXPLANATION OF PLATES.

PLATE I.

Fig. 1. *Tetraphis pellucida*: Frondiform protonema, × 50.
Fig. 2*a*. *Orthotrichum Lyellii*: Adventitious budding on leaves, × 80.
Fig. 2-6. *Clasmatacolea cuneifolia*. 2-4, Polymorphous stipules. 5, Leaf, × 175. 6, Plant bearing female bracts, × 35.
Drawn from specimens collected on rocks at Lough Duff, Brandon, Co. Kerry.

PLATE II.

*Flagiothecium elegans*: 1, branch showing adventitious ramuli, × 20. 2, ditto, × 50. 3, detached adventitious branch with young leaves, × 200. 4, young leaf taken from near apex of - on No. 3, showing cell structure, × 500. 5, normal leaf, × 75. 6, capsule, after Wilson.

# LISSONOTA BASALIS BRISCHKE IN IRELAND.

## AN ADDITION TO THE BRITANNIC LIST.

BY REV. W. F. JOHNSON, M.A., F.E.S., M.R.I.A.

In August, 1915, I took a pair of Lissonota *in cop.* in one of my fields. At the time I supposed them to be *L. sulphurifera* Grav., and referred to them as such when writing about them,[1] although I made mention of certain points of difference in the male from typical *L. sulphurifera.* This note was seen by Mr. A. Roman, the eminent Swedish hymenopterist, who most kindly wrote to me and suggested that I had probably taken *L. basalis* Brischke. He asked me to examine the tibiae of the male and see if they were narrowly whitish at the base, for this character combined with the dark head which I had already noted would point to my insect being *L. basalis.* On examination I found that this character was present, and consequently my insect was *L. basalis.*

Brischke originally described this species in 1864[2] as

[1] *Entomologist's Monthly Magazine*, vol. lii., 1916, p. 18; *Irish Naturalist*, vol. xxv., 1916, p. 17.

[2] *Schriften Phys. Ökon. Ges. Königsberg*, v., 1864, p. 192.

follows :—" Nigra ; apice mandibularum et clypei rufescente, stigmate piceo-nigro vel dilute-fusco, radice et squamula (maris puncto ante alas) albido-flavis (feminae squamula testacea) : pedibus rufis, tarsis posticis nigris (maris basi tibiarum flava)." At a later date, in 1880,[1] he varied this description slightly as follows :—" Nigra ; clypeo rufescente, stigmate nigro, radice et squamula (in mare puncto ante alas) flavis ; pedibus rufis, tarsis posticis nigris (in mare basi tibiarum flava)."

The male of *L. basalis* differs from that of *L. sulphurifera* in having the head not narrowed behind the eyes and black except the rufescent clypeus, also in the narrow whitish or flavous band at the base of the tibiae. I have three males all captured here, and in one the spot before the wings is large and triangular, in a second it is small and circular, while in the third it is altogether wanting. The female which I took differs from that of *L. sulphurifera* in the following points :—the head is not narrowed behind the eyes, the apical half of the clypeus is very pale, almost white, the basal half black, the palpi fuscous, all the coxae black, the trochanters black at base, red at apex, stigma black, radius and tegulae pale, hind tarsi light fuscous.

Brischke says that it has been bred from *Hadena suffuruncula* (which is also a host of *L. sulphurifera*) and *Tapinostola elymi*.

He describes the cocoon as cylindrical, thinly covered, glittering, brownish-white or dark-brown. He records the insect from North Germany, and Mr. Roman tells me that he has met with it in Sweden. It has not been hitherto met with in the British Isles, and I have much pleasure in adding this species to our Irish fauna.

I wish to thank Mr. Claude Morley, F.E.S., and Mr. R. Lloyd Praeger, M.R.I.A., for their very kind help in obtaining for me copies of Brischke's descriptions of the species, which I could not have obtained otherwise as I am not within reach of a library of entomological works.

Poyntzpass, Co. Armagh.

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[1] *Schriften Nat. Ges. Danzig*, vol. v., 1880. Heft 4, p. 123.

# ON THE VARIATION OF THE LIZARD

## (LACERTA VIVIPARA).

BY R. F. SCHARFF, B.SC.

In my report on the Reptiles and Amphibians of the Clare Island Survey,[1] I expressed the opinion that Lizards from Ireland showed no characters by means of which they might be distinguished from British or Continental specimens of the same species. This is rather remarkable considering that this animal offers so much scope for variation and that it occurs under such extreme diversities of soil and climate.

The same subject has recently been reinvestigated by Dr. Boulenger,[2] who had at his disposal in the British Museum a very much larger series of specimens than I had. There were altogether 150 specimens from various parts of Europe and Asia. He compared minutely the shape of the body, the scales, the colour and size of the specimens, and as the result of these researches declares his inability to distinguish any varieties or geographical races. It is one of the most remarkable instances of a persistent type of animal. Specimens of this Lizard from Clare Island in the west are indistinguishable from those occurring in the Island of Sachalien in the Pacific, or from those found on the Amoor in Northern Asia, Lapland, Bulgaria, Italy, the Alps or Pyrenees.

National Museum, Dublin.

# IRISH SOCIETIES.

## ROYAL ZOOLOGICAL SOCIETY.

Recent gifts include a Patas Monkey from Mr. T. S. Russell, a Fox from Miss Joye Stronge, a Badger from Mr. G. Moore, a Hedgehog and a Jay from Mr. W. W. Despard, a Swan from Mr. F. Power, a pair of Doves from Miss Vernon, and a pair of Amherst Pheasants from Mrs. W. Bailey. A Drill has been deposited in the Monkey House.

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[1] *Proc. R. Irish Acad.*, vol. xxxi., 1912, part 18.

[2] *Journal of Zool. Research*, vol. i., 1917, pp. 1-16.

## DUBLIN MICROSCOPICAL CLUB.

March 14.—The Club met at Leinster House, N. Colgan (President) in the chair.

Sir F. W. Moore exhibited a leaf of *Crassula namaquensis*, to show the peculiar hairs which are thickly distributed over the surface of the thick fleshy leaf. The hairs are unicellular, stout, cylindrical, and devoid of contents; they are all inclined at a sharp angle towards the apex of the leaf.

Dr. G. H. Pethybridge exhibited germinating Flax seeds (*Linum usitatissimum*) having two embryos in each seed. Polyembryony is of course a well-known phenomenon and is a normal state of affairs in Cycads and Conifers. Maxwell Masters in his "Vegetable Teratology" (1869) gives a list of plants other than cycads and conifers in which plurality of embryos has been recorded, but the genus Linum does not occur in it. It is thought probable, therefore, that polyembryony has not previously been recorded as occurring in Flax. In Worsdell's "Principles of Plant-Teratology," published last year, the subject of polyembryony is not dealt with.

J. N. Halbert showed a specimen of the plant-bug *Calocoris striatus*, a handsomely coloured insect, found last June on hawthorn in a wood at Ardfry Point in County Galway. It is apparently an extremely local species in Ireland. A second specimen is preserved in Haliday's collection, but the locality in which it was found has not been recorded. The species is rather local in Great Britain, occurring in open places in woods as far north as the shores of the Moray Firth.

## BELFAST NATURALISTS' FIELD CLUB.

February 20.—Robert May presiding. At the opening of the meeting a sympathetic resolution was passed in silence to the relatives of four deceased long-standing members—William Gray, M.R.I.A., the Right Hon. Robert Young, John Frame, and George H. Elliott. F. J. Bigger, M.R.I.A., then gave a lecture on two old churches in Lecale, Raholp and St. Nicholas of Ardtole.

## DUBLIN NATURALISTS' FIELD CLUB.

January 18.—The President (Prof. Carpenter) in the chair. Prof. A. Henry lectured on the Growth of Forest Trees in Ireland, pointing out the dependence of tree growth on climate both with regard to temperature and wind force. The lecture, illustrated by numerous lantern pictures, was discussed by the President, N. Colgan and R. Ll. Praeger. The officers serving during 1916 were re-elected for 1917.

February 15.—The President in the chair. A number of exhibits were shown, among which Prof. Cole's demonstration of the granite from Mullaghderg, Co. Donegal, enclosing spherulite was especially noteworthy. (*Sci. Proc. R.D.S.*, xv., 1916, No. 15.)

March 15.—The President in the chair. W. Haigh, B.Sc., lectured on the Ancient Volcanoes of Ireland, tracing the evidence for volcanic activity in various parts of the country from Silurian to Eocene times. The subject was discussed in a masterly way, and the lecture was admirably illustrated. The President, R. Ll. Praeger and J. de W. Hinch took part in the discussion.

March 24.—Excursion to Trinity College Botanic Garden.—A party of sixteen assembled at Lansdowne Road at 3 o'clock on the kind invitation of Dr. Dixon, Professor of Botany, and favoured by fine spring weather spent a most enjoyable and instructive two hours in rambling through the grounds and glass-houses. The abundance and luxuriance of Cordyline, of which many fine examples upwards of fifteen feet in height were grown here from seed, was perhaps the most striking general feature on a first view of the grounds. An uncommonly tall specimen of *Salisburia adiantifolia*, the Maiden-hair Tree or Ginko of the Japanese, was pointed out by the conductor, and also a tree of Pyrus bearing flourishing tufts of mistletoe, where planted in the trunk by the late Archbishop Whately. Some picturesque old Stone Pines (*Pinus pinea*), the species which yield the edible seeds, the *Pinocchi* of the Italians, were noticed, and many plump cones were picked up on the grass beneath. They bore apparently perfect seeds, but on breaking open several they all proved to be "blind," the kernel being quite undeveloped. It seems that the species never forms perfect seed here. At the entrance to the orchid house, where many handsome species were in flower, a wall beautifully draped with Maiden-hair and frondose Selaginellae won the admiration of the visitors.

Perhaps the most curious thing brought under the notice of the party was a variegated variety of that delicate little creeper our Kerry *Sibthorpia europaea*. In this the leaf-margins were pure white as long as the plant was grown out of doors in a cold frame, but when removed to an adjacent glass-house the plant ceased to produce these white-margined leaves, the new shoots reverting to the normal tender green colour. An interesting field for experiment appears to be opened up here. What are the precise changes of condition which induce this reversion to type? Does the variety come true to seed? These are amongst the questions suggested by the behaviour of this plant.

Some of the curious forms which Dr. Dixon has produced by the hybridising of our Kerry Saxifrages, *S. umbrosa* and *S. Geum* are grown here in the open air. The nature and results of these experiments, which have so clearly and for the first time demonstrated the hybrid origin of *Saxifraga hirsuta* and other puzzling intermediates so frequent in the Kerry Highlands, are fully set out in Mr. Scully's recently published *Flora of County Kerry*. Owing to the very late spring few plants were in flower in the gardens. On one of the rockeries, however, there was seen in brilliant crimson bloom a fine tuft of *Saxifraga oppositifolia*, the hardiest of its hardy genus, equally at home at 11,700 feet on Monte Rosa, at 17,000 feet in the Himalayas, and at sea-level on the desolate shores of Grinnel Land within eight degrees of the Pole.

# NOTES.

## Some Co. Antrim Proverbs.

Just now when the weather and the food question are the main topics of conversation, perhaps the two enclosed old saws from Co. Antrim on these subjects might interest the readers of the *Irish Naturalist.* It would be interesting to know if they are universal in Ireland.

WEATHER.

March borrowed from April
  Three days and they were ill.
The first was wun an' weet,
  The second snaw an' sleet,
The third was a freeze that would ha' freezed
  The bird's nebs to the trees.

FOOD.

Barley bread will do you good,
  Rye bread will do you no harm,
Wheaten bread will sweeten your blood,
  Oaten bread will strengthen your arm.

I have heard a southern variation of the one about the March weather, but have forgotten it. There may be others of a similar nature that would be worth collecting.

M. C KNOWLES.

National Museum, Dublin.

## BOTANY.

### Selaginella Kraussiana in Ireland?

Whilst spending a holiday at Bundoran at Easter, 1912, I gathered a number of cryptogamous specimens, mostly mosses and lichens. Amongst them, however, Mr. W. G. Travis, President of the Liverpool Botanical Society, on a recent inspection of my gatherings, noticed a specimen which he declared to be a Selaginella. It was certainly not the only known British species but more nearly resembled a specimen from Grand Canary, which he had in his possession. On reference to Mr. Gepp, of the British Museum, it was named by him *Selaginella Kraussiana*, A. Br. which occurs in the Azores, Madeira, Sicily, and Cape Colony. Unfortunately, my record of this specimen is not complete, so that I am partly dependent on memory for particulars of the habitat in which it occurred. With this reservation, the occurrence of the plant in an Irish station should perhaps be brought under notice, so that Irish botanists may be in a position to confirm or supplement the record The specimen is

believed to have occurred on wet clay banks sloping to the beach at Tullaghan, near Bundoran. If the occurrence prove a permanent one, it should be of particular interest to Irish botanists as constituting a notable addition to the Lusitanian or Iberian element in the Irish flora.

WM. A. LEE.

80 Cavendish Drive,
Rock Ferry, Cheshire.

## ZOOLOGY.

### Should Wasps be killed ?

The question whether wasps should be left in undisturbed possession of their prey is still undecided. Some authorities like Prof. Carpenter seem to be of opinion that they do more good than harm in killing flies and their larvae during summer. But perhaps he does not possess a fruit garden and may not therefore be brought so vividly in contact with the undoubted damage wasps inflict on fruit. I have frequently watched these creatures and have never seen them attack flies, though I am loth to disbelieve in the observation of those who speak to the contrary. Anyhow an actual test of balancing the amount of benefit against that of the damage done has never been carried out, and it must thus remain a matter of opinion whether wasps are beneficial or injurious. I may confess that in order to preserve my fruits from injury I kill wasps freely. Now it may not be generally known that all wasps appearing before June are queen wasps. If these are killed it means the destruction of a whole brood of wasps. Hence the necessity of starting the slaughter early in the year. I find that gooseberry flowers form a great attraction to queen wasps and these were in flower last year towards the end of April. Later on, as Mr. Beresford has pointed out, wasps are often found in profusion among the flowers of the various species of Cotoneaster. When thus busily engaged the wasps can be easily killed.

R. F. SCHARFF.

National Museum, Dublin.

### The Jay in Ireland.

Referring to Mr. May's note in a recent issue of the *Irish Naturalist* (p. 53 *supra*) it appears that this species having remained resident for so many years in the southern counties has now begun to extend its range. In January this year several birds were observed at Lord Talbot's demesne near Malahide, one having been shot in mistake. They have also appeared at Kilcrony, Bray, and recently at Mountbellew, Co. Galway. I am also glad to report that Lord Talbot has given orders that they are not to be destroyed.

W. J. WILLIAMS.

Dublin.

# AN EXTERMINATING WINTER: ITS EFFECTS ON BIRD-LIFE IN CO. WEXFORD.

BY C. B. MOFFAT, B.A., M.R.I.A.

The great snow-storm of January 26th, 1917, brought unprecedented havoc on the bird-life of the area over which it swept. In this neighbourhood—by which I mean that part of the Co. Wexford lying between the rivers Urrin and Boro, two tributaries of the Slaney that have their sources some six miles apart on the eastern slope of the Blackstairs range—five resident species were exterminated, while another was reduced to little more than a twentieth part of its former number.

Taken as a whole, the winter of 1916-17 was the most severe experienced in this part of Co. Wexford, and probably in Ireland generally, for at least fifty years; but in spite of the hard frost that characterised nearly the whole of December and also the greater part of January, no species of bird underwent more than a partial thinning of its numbers up to the time when the memorable snow-storm began, on the night of January 25th.

Happily, this snow-storm did not cover the whole of Ireland. Its range might form the subject of an interesting distributional map, and it is hard to say how many branches of our fauna may prove to have been affected by it. From the accounts given in Dublin newspapers, it appears to have fallen most heavily over a region comprising the counties or county-divisions of East Mayo, Roscommon, King's County, Kildare (southern half), Wicklow, Carlow, Wexford, Kilkenny, South Tipperary, Waterford, and East Cork: a sort of broad diagonal belt crossing Ireland from N.W. to S.E., in the form known in heraldry as a "bend." The rest of Ireland was at the time severely frost-bound; but still there was a large area on either side of the snow-belt offering an improved chance of survival to such birds as made a timely retreat. The increased competition for food thus brought about in those parts of the country that were spared the heavy snowfall would, however, operate even more fatally against

the refugees from the snow-covered area than against the birds previously in possession of the ground; and I have no doubt that both were severely affected, so that the extermination wrought by the snow may prove to have been much more widespread than the extent of ground actually covered.

The average depth of the snowfall of January 26th in this district was fifteen inches. From notes kept at Ballyhyland during the past fifty-six years it appears that this depth had been measured once—but only once—before, on the occasion of the great snow-storm of January 17th, 1881. In 1881, however, the snow had nearly all gone by January 31st, whereas in 1917 it had barely begun to relax its hold after three weeks, and patches still lay unmelted on the 15th of March.

The severity of its effect on bird-life was, of course, much increased by the long sufferings previously undergone during many weeks of frost. The progressive severity of the season can be illustrated by the case of the Song-Thrush (*Turdus musicus*). During the long December frost the roadsides were lined with starving birds of this species, belonging both to the Continental and to the British form; but there were then no Blackbirds in the distressed crowd, the hardier constitution of the last-named bird enabling it to shift pretty well for itself, while hundreds of Thrushes were perishing all round. Very different was the scene a week after the coming of the snow. The roadsides were now lined with starving Blackbirds, and the Song-Thrush was as conspicuous by its absence (though for a tragically different reason) as the Blackbird had been during the earlier troubles. The fate that now seemed to overhang the stronger bird had already befallen the weaker.

The British Song-Thrush (*Turdus musicus Clarkii*) was not, indeed, one of the five resident birds that were totally exterminated in this district. A remnant survived, and I think we had about one-twentieth part of the usual number of Thrushes singing in our fields during March. But it does not follow that anything like that proportion had lived through the winter in this country. No Thrushes

were heard in song until February 23rd; and it should be remembered that by that time, in any ordinary year, the birds of this species that have wintered abroad will have returned and reoccupied their Irish breeding quarters. Mr. Barrington (*Migration of Birds*, p. 15) has shown that the first ten days of February are, in a normal year, the period of maximum migration of the Song-Thrush at Irish light stations; and he has also drawn attention (p. 276) to the fact that the Song-Thrushes taken at our light-houses in early spring have, on an average, shorter wings than those that strike the lanterns in autumn, which belong (at least largely) to the Continental form. With these two facts before us, it is impossible to doubt that most of our emigrant native Song-Thrushes return to our shores in early February, or as soon thereafter as weather conditions permit. We cannot, therefore, be sure that any of the birds that were heard singing this year on or after the 23rd of February—and before that date I heard none—had wintered amongst us. I believe, however, that a few—a very few—Song-Thrushes lived through the visitation of the snow.

The five species that were exterminated in this district, where they were all previously common birds, were the Stonechat (*Pratincola rubicola*),[1] Golden-crested Wren (*Regulus cristatus*), Long-tailed Titmouse (*Acredula caudata*), Grey Wagtail (*Motacilla melanope*), and Meadow Pipit (*Anthus pratensis*). All five were with us, in numbers not greatly below their usual winter strength, until the snow-storm descended and swept them utterly away.

At any other time than the spring of the year it would be rash to assert the total extinction of a species on no better evidence than that the writer has failed to find it. But February and March are marked by such general

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[1] The proper names of this and the three succeeding species are, according to the new B.O.U. list, *Saxicola rubicola*, *Regulus regulus*, *Ægithalus caudatus roseus*, and *Motacilla boarula*. I prefer, where the difference is merely one of nomenclature, to adhere to the names that are found in standard text-books most generally used in Ireland—Saunders's "Manual," Ussher and Warren's "Birds of Ireland," and the "List of Irish Birds," by R. J. Ussher, published in 1908 by the National Museum.

resumption of song, reoccupation of breeding quarters, and proud display by the male birds of their readiness to take the field against all intruding rivals, that a little local knowledge of the most favoured spring resorts of the various "missing" species should enable an ornithologist to make practically sure of the presence or absence of the birds. By the end of March the question would be complicated by the fact that four out of the five species mentioned above are summer visitants as well as residents, and should by that season have returned in some force to their Irish nesting quarters. It was, therefore, necessary to remain continuously on the outlook for signs of spring immigration; but the backward character of the year rather simplified the problem.

The Stonechat, the first of our lost birds, is not only a partial migrant but, in most years, one of our very early spring visitors; for the Irish light-house returns show that three-fourths of Mr. Barrington's specimens during the spring movement had struck the lanterns between the middle of February and the middle of March. But though I have visited many of this conspicuous bird's best-known haunts during the past two months not a Stonechat have I seen. Even at so late a date as April 24th I went up Blackstairs without seeing a sign of its presence anywhere on the mountain. The melancholy state of its loved furze-bushes, nearly all killed by the snow, would perhaps deter it from occupying its usual quarters; but I have no proof that, even as a migrant, it has yet (April 28th) visited any of its haunts this year.

The absence of the Golden-crested Wren it still more marked; for the song of this little bird, first heard as a rule about the beginning of February, is one of the most familiar of the greetings to which the nature-lover in Ireland has hitherto been accustomed as he took his walks around. The fact of its extermination as a resident breeding species has been set beyond doubt by its prolonged silence. As a spring immigrant it is not so early as the Stonechat. Mr. Barrington's records show that most of the captures by light-keepers are made between the 15th of March and the 15th of April. From these

rather late dates, compared with the early dates at which it was usual to find the resident Goldcrests nesting, it may well be doubted whether the immigrants really contributed any quota of consequence to the ranks of our breeding birds. It would, however, be of great interest to observe what use they would make of their opportunities of easy possession, should they return this spring to find the country a "clean slate." The period of their normal immigration has, unhappily, elapsed, and the Goldcrest is still missing.

The Grey Wagtail has always been much more thinly distributed than any of the other species on my list of missing birds; but it yields to none in the regularity with which it returns yearly to the same nesting resorts, and it is, therefore, an easy bird (though not very much of a songster) to keep count of in a local census. The males frequently repair to their breeding quarters so early as the beginning of March, and wait there patiently for the arrival of their mates, which may take place before the middle of the month, but does not always occur until early in April. In the latter event it may generally be assumed that the hen-bird is an immigrant. The lighthouse records of this wagtail's spring migration are scanty. The Barrington Collection, now in the National Museum, contains, as Mr. Nichols kindly informs me, only two spring-killed specimens (both received subsequent to the publication of Mr. Barrington's book)—one disabled at the lantern of Blackwater Bank lightship, Co. Wexford, on March 18th, 1901, and the other shot, probably on migration, at Rockisland, Cork, on April 2nd, 1912. But I have invariably found all the nesting resorts in this neighbourhood, and also those on the Dublin streams, occupied by the breeding birds in pairs, at latest, before the close of the first week of April. Any immigration of birds that come to breed must therefore take place before that time, unless in a very abnormal year. This year we have reached the end of the fourth week of April without my seeing more than one nesting locality occupied by this beautiful species, though I have kept ten such stations under observation. The only pair I have seen—at a long-

established haunt on the Boro—were first found in possession on the 19th of April, but may have been actually there for about a week before I saw them. The fact that nine out of ten breeding resorts still remain vacant, shows how very small a proportion of the species has been preserved to us by its partially migratory character. Either the migrants are very few in comparison with the residents, or else the severe winter told on a large proportion of those that went away, as well as on those that stayed.

That the latter explanation is, to some extent, the correct one appears probable from the case of the last "partial migrant" on my list, the Meadow Pipit or "Titlark."[1]

The Titlark is found in most years to strike the lanterns of Irish light-stations with considerable frequency during the period from the 10th of March to the 10th of April; and within the same period flocks of this species are apt to appear in our fields, their bright fresh plumage quickly attracting notice. This year, instead of the usual influx of showy and sociable-looking Titlarks, I saw on March 21st and from that time onward to about the middle of April a few solitary and dull-plumaged specimens, which, from their poor plumage and listless manner, I could not believe to be newly arrived spring migrants. More probably they were birds that had struggled through the winter in some part of our own island where conditions were a few shades more tolerable than in the deep-snow zone. At any rate, it was not until the fourth week of April, when, with a high barometer, the real rush of spring immigration set in, that I first saw what I could confidently pronounce immigrant Meadow Pipits, and even then their numbers, compared with those generally observed, were very small. It was not until April 27th (the date last year was March 5th) that I heard the first Meadow Pipit's song. I have since heard some seven or eight more. The poor derelict birds that

[1] "Titlark" is the common name by which I hear this species generally designated by field-workmen in this part of Co. Wexford. I am told by Dr. Benson that in the north of Co. Dublin it is called by the curious local name of "Swiney," of which I had never heard, nor can I suggest any explanation.

had been drifting about since the 21st of March do not appear to have thought of starting breeding operations; and though the later arrivals are clearly prepared for matrimony, their small numbers augur badly, I am afraid, for the hopes of a successful season. The Cuckoo, in this part of Ireland, almost invariably lays on the "Titlark" the burden of rearing her young. This means, for each female Cuckoo, the destruction of the lawful broods of from five to eight pairs of Titlarks; and this annual sacrifice is, in most years, quite compatible with the maintenance of the full numbers of the duped species, owing to its being so much more numerous than its artful enemy. This year, the conditions are reversed; the supply of "Cuckoo's Nurses" will apparently fall far short of the demand, and the chance of any young "Titlarks" being successfully reared in the district is poor indeed.

As to our fifth missing species, the Long-tailed Titmouse, it has no recognised status as a migrant, and I can only hope that in some other parts of Ireland, where the winter has been kinder, it may increase and multiply until economic causes dictate its resettlement in the districts lately cleared of its presence.[1] The large broods often reared by this species encourage the hope that it may soon spread back to us.

That many other birds besides the six I have mentioned had their numbers sorely reduced is, of course, beyond question; but there were, in this district, some striking exceptions—birds that, so far as I could see, suffered no loss at all. Among these figure, as might be expected, our three peculiarly Irish sub-specific forms, the native Dipper (*Cinclus cinclus hibernicus*), Coal Titmouse (*Parus ater hibernicus*), and Jay (*Garrulus glandarius hibernicus*). These insular and non-migratory races could hardly have maintained themselves for the long time that must have

[1] Since writing as above I have received from Miss Cooper, of Killanne Rectory, the welcome information that a pair of Long-tailed Titmice were seen by her within the Rectory grounds about the 15th of May. Miss Cooper also believes that some Grey Wagtails lived through the winter at Killanne, where they must have enjoyed the benefit of exceptionally favourable surroundings.

elapsed since their settlement in Ireland (probably before the present British and Continental races had been developed) had they not been proof against the worst vicissitudes of the Irish climate from pre-historic to present times. Other birds that survived equally well were the Robin, Hedge-sparrow, Wren, and Blue Titmouse. A more surprising instance of hardihood was presented by the Tree-Creeper; for this frail-looking little thing has never within my memory been anything like so numerous here as it has been all through the present spring, and its song is heard on all sides. The weather would seem to have had quite a bracing effect on it.

The Crossbill, which had frequented the woods here in good-sized flocks all the winter, not only showed no falling off in numbers, but might be heard gleefully proclaiming its intention to start nesting operations (an intention since fulfilled) so early as February 14th, while the ground was still prevailingly white. The spring assemblages of the Magpie, which Darwin believed to be held for the purpose of a general selection of mates—and which undoubtedly somehow mark the commencement of the period of nidification—were attended as numerously as usual, and began about the usual time (first noticed February 18th). The Sky-lark, only a few days after the holding of the first "magpie parliament," was pouring out such torrents of song from many throats as to indicate that hundreds of larks were already competing for nesting ground in fields that could not accommodate more than a few pair. The Woodcock and Snipe, before February was over, had both begun their curious nuptial evolutions and music over their breeding haunts in the first hour of the evening twilight; and the numerical strength in which both these birds appeared so soon after the disappearance of the snow gives rise to a curious question.

Of the Woodcock I can only say that I think the numbers seen flying at dusk this year were about the same as usual. Of the Snipe, however, I can speak more confidently, because in this neighbourhood, where there are no large bogs, it breeds chiefly in small isolated patches of boggy

ground, seldom sufficient to accommodate more than one pair during the jealous period of the nesting season; and over these patches, to which they return constantly year after year, the male birds disport themselves on fine evenings with a regularity that makes it easy to keep accurate census of the number of breeding pairs. This year I found that all the nesting grounds known to me were occupied as usual, either by the end of February or quite early in March—showing that the numbers of the Common Snipe, as a breeding species, were certainly not reduced.[1]

Now it is remarkable that the Woodcock, Snipe, and Sky-lark are all included by Mr. W. Eagle Clarke (*Digest of British Association Migration Reports*, 1896, p. 15) in a list that he gives of "the species which appear to be specially susceptible to cold." Oddly enough, this list does not contain the name of a single one among the five species that I have had to enumerate as totally killed off in this district by the cold of the early months of 1917; and yet it contains as many as three of those that would seem to have been least affected by that catastrophe, since they turned up in their full normal strength at their accustomed breeding haunts immediately after the retreat of the snow.

I do not contend that Mr. Eagle Clarke's conclusions are invalidated as to the delicacy of the above-named three birds. Indeed, it is almost inconceivable that birds like the Sky-lark, Woodcock, and Snipe, whose food is obtained solely on the ground, could have lived through the three weeks from January 25th to February 14th in a district where nearly all the ground was under frozen snow averaging more than a foot in depth; and still less credible is it that, having survived such conditions, they should have emerged from the ordeal in splendid form and high animal spirits, taking prompt possession of their

[1] The Snipe has evidently been less fortunate in other parts of Ireland, as I see that Mr. Robert F. Ruttledge, in a letter to the *Irish Times* of May 10th, remarks on its complete disappearance from its spring haunts in the Hollymount district of Co. Mayo. This increases the need for some explanation of the survival in undiminished numbers of our breeding birds in the south-east.

breeding quarters, and making the air ring with their proudest notes of courtship, challenge, and jubilation.

In the case of the Sky-lark, I think there can be no difficulty about accepting the conclusion that the birds which were heard singing so numerously during the last week of February were returned migrants. The spring migration of this species is known to be on a large scale, and the light-house data go to show that February is probably the month in which it reaches its maximum. The influx this year must have been very happily timed to account for the great numbers seen and heard before the end of the month. From February 20th to 28th we had weather that seemed really favourable to migration; it was then that the bulk of our Redwings left us, and the Song-Thrush and Blackbird (some of both species being, doubtless, new immigrants) took to singing. From the end of February to the middle of April we had no equally favourable week, and the return of many of our other partial migrants would seem to have been largely prevented.

The Woodcock and Snipe, which turned up in force about the same time as the Sky-lark, present a more thorny problem, since there is no proof of a regular spring influx of either of these birds into Ireland, or even into Great Britain. But Mr. Barrington has shown (*Migration of Birds*, pp. 209-10) that some of the light-house evidence points to such an immigration, and as these birds are so little addicted, even in autumn, to striking the lanterns, absence of fuller proof is not conclusive to the contrary. I believe the facts here adduced will go some way towards strengthening Mr. Barrington's suggestion that both the Woodcock and Snipe are summer as well as winter visitants. The birds that were watched performing their spring evolutions during the last week of February, after this exceptionally cruel winter, were, at any rate, in much better physical condition than one would have expected them to show had they passed the severe weeks from January 25th to February 14th in any part of Ireland.

Ballyhyland, Co. Wexford.

# ELATER PRAEUSTUS F., AN IRISH BEETLE.

BY HORACE ST. J. K. DONISTHORPE, F.Z.S., F.E.S.

In June, 1902, my friend Mr. F. Bouskell and I captured specimens of a red Elater which were found on a road at Glencar, Co. Kerry. These were said to be *E. pomonae* Steph., and were recorded as such (*Ent. Rec.* xiv., 240, 1902; *Irish Nat.* xii., 60, 1903) although neither Bouskell nor I have ever felt satisfied that they were that species. Placed among a series of *E. pomonae* they catch the eye at once as evidently being out of place.

Recently Mr. Pool, who is working at a paper on the British red Elaters, asked me to examine my specimens, This caused me to make a careful study of the Irish insect. and I became convinced it was something new. When I met Pool at the British Museum he was able at once to pick out this beetle, and he tells me he has now examined large numbers of British specimens, and has not seen another like it.

In examining the species in the general collection I found mixed in the series of *E. praeustus* specimens very like the Irish species (the only ones in the whole collection near to it), one from Montpellier being almost identical. Either *E. praeustus* is a very variable insect, or there are two species mixed up in the large series at the Museum, one being undescribed.

Typical *E. praeustus* are larger, duller, and more closely and strongly punctured, they have a broad black tip to the elytra, and such specimens do not appear to have golden pubescence beneath. It is very widely distributed, having been found in North and South Russia, Sweden, France, Spain, etc., etc.; it may be best therefore to record the Irish beetle as *E. praeustus* F., new to the British list, rather than to make a new species.

I have drawn up the following description of the Kerry insects :—

*Black, with red elytra, the extreme tip of which being blackish; tarsi reddish brown, lighter at apex. Upper surface furnished with black hairs; body beneath with golden pubescence.*

*Head* coarsely and thickly punctured with umbilicate punctures.

*Thorax* completely punctured all over with close umbilicate punctures; *scutellum* thickly and coarsely punctured. *Elytra* closely punctured all over. *Long.* 10 mm.

From *E. pomonae* it differs in many ways; the colour of the elytra is a darker red, not so pink; it is entirely more closely punctured, and consequently not so shining. The black hairs on the whole upper surface are a little shorter, and individually less stout, though more abundant and closer together. The first joint of the antennae and the anterior tibiae are more closely punctured, as is also the head. The scutellum is more coarsely and closely, and the interstices of the elytra more closely and distinctly punctured. One of the most striking differences is the entirely punctured base of the thorax, elytra, and black rims of the latter, which in *pomonae* are almost impunctate.

London.

# REVIEWS.

## BRITISH AND IRISH FLIES.

**A Guide to the Literature of British Diptera.** By Percy H. Grimshaw, F.R.S.E., F.E.S. From *Proc. R. Phys. Soc. Edinb.* Vol. xx., pp. 78-117. Edinburgh: R. Grant & Son, 1917. Price 2s.

Students of this most important though most difficult order of Diptera will be grateful for the valuable summary of the literature given by Mr. Grimshaw of the Royal Scottish Museum in his vice-presidential address. There are 416 references beginning with Moses Harris' "Exposition of English Insects," 1782; the books and papers listed are classified under subjects and families, with plenty of cross-references, so that the use of the bibliography is made as easy as possible. Mr. Grimshaw has not included the writings of foreign entomologists on families and species included in our fauna; references to these will, however, be found in bibliographies attached to the more comprehensive of the British and Irish memoirs. Irish naturalists will read with pleasure the well-deserved praise bestowed on A. H. Haliday's writings.

G. H. C.

## VEGETABLE MONSTROSITIES.

**The Principles of Plant Teratology.** By WILSON CROSSFIELD WORSDELL, F.L.S. Vol. ii. London (Ray Society): Dulan & Co., 1916. Pp. xvi + 296. Plates xxv-liii. Price, 25s. net.

The first volume of this work was reviewed in the *Irish Naturalist*, vol. xx., May, 1916, p. 77, and the second volume, issued to the subscribers to the Ray Society for the year 1916, now lies before us. It may be recalled that vol. i. dealt with teratological phenomena as exhibited by the Cryptogams and by the root, stem and leaf of Phanerogams. The present volume deals with the flower, and under that term is included "not only the flower" of the Angiosperms, but also the "cones" of Gymnosperms and Vascular Cryptogams, and the sporophylls of Ferns, which are not contained in what we usually term a "flower." A few abnormalities in fruits are touched on in the volume, but there is no section dealing with seeds.

The material is dealt with under three main headings, viz.: (1) Differentiation, (2) Simplification, and (3) Adventitious Flowers, these sections being subdivided into Prolification, Forking, and Fasciation, Disruption, Positive Dédoublement, Dialysis, Metamorphosis, and so on. Naturally the method of treatment closely follows that adopted in the first volume, and we find in both volumes not merely descriptive details of teratological appearances, but well developed discussions as to their meaning and suggestions concerning the light they throw on problems of morphology and development. In this connection the pages dealing with the theory of anther-structure may perhaps be singled out for mention. Teratology as the key to morphological problems is the essence of the whole work.

In his "Final Conclusions" the author utters a lament that there appears to be a tendency amongst modern botanists to neglect the study of abnormal forms as a guide to the solution of morphological problems, and he speaks also of "the wavering interest of botanists of the present day in the subject of comparative morphology itself (there being a greater concentration on mendelism, physiology, and ecology) . . ." He maintains that this subject including its sub-section teratology "is every whit as important as any other department of the science" of botany, and he states that it was to afford some indication of this that these volumes were written. Judging from the large number of papers cited in the excellent bibliographies found at the conclusion of each of the main sections of the book—by no means all of them of antiquated date—this lament is perhaps not wholly justified. It is true we have lacked a comprehensive yet compact survey of this field of work, and we have to thank the present author for having made a serious and successful attempt to fill the gap.

The book is not one which an amateur or a young student can read rapidly with profit, and the style may perhaps be found to be of the "dry" rather than of the fascinating order. A tendency towards pro-

literation in technical terms (such as *phyllomania, bracteomania*) is also observable, but the glossary provided at the beginning of the volume will be found helpful. To the future, of course, belongs the study of the *causes* of abnormalities and the degree of their inheritance—physiological teratology—if we may so term it, but for the present Mr. Worsdell's volumes certainly provide us with a succinct treatment of the subject from the morphological standpoint.

The present volume, like the former one, is abundantly illustrated. One could have wished, however, that more of the figures had been distributed through the text instead of being massed in the form of plates at the end of the book. Some of the plates and figures are good, but others can only be described as bad, such for instance as figs. 121 and 136 and Plate 45.

It would appear as if a collection of technically good photographs of plant malformations was sorely needed, and some of our clever field naturalist photographers might do worse than specialise in this direction.

G. H. P.

## THE DUBLIN DRIFT DEPOSITS.

**Geological Map of the City of Dublin Area.** Drift Edition. Surveyed in 1901 by A. McHenry. Published with minor Revisions by Grenville A. J. Cole, Director. 1917. Scale 6 inches to the mile. Dublin: Ordnance Survey Office. Price 3*s*.

This map may be heartily commended to inhabitants of Dublin interested in the topography and geology of the city and neighbourhood. The area represented extends from Glasnevin to Rathmines and from Castleknock to Sandymount. By far the greater part of the surface is covered with Boulder Clay, but the alluvium and gravels of the Liffey, Tolka, Cummack and Dodder are conspicuous, and the old course of the Poddle can be traced by remnants of alluvium along the now closely-built district between St. Patrick's Cathedral, the Castle and Parliament Street. The shore-line of the Liffey estuary marked on Sir Bernard de Gomme's map of 1673 is indicated, demonstrating the extensive reclaimed area along the North and South Walls, and explaining the name of the North Strand Road. The printing of the map is clear, although a trifle heavy. It is five years since the Ordnance Survey published the map on which the geological details have now been marked by the Geological Survey, yet we are surprised to see the University College premises in Earlsfort Terrace marked "Royal University," and the Royal College of Science new building in Upper Merrion Street totally ignored although completed in 1911.

G. H. C.

# NOTES.

## ZOOLOGY.

### Some Migrant Notes.

The arrival dates of migratory birds may be rather threadbare, and yet hold a perennial interest in every sense. The phenological department of the Royal Meteorological Society has lately added a migrant table to its other returns, seeking for indications of late or early seasons by the variation in first arrivals. From my own experience, my impression is that the first arrivals are so regular to time that the variation observed is likely to be much more that of the observer's chances than of the bird. (See the regularity of Corncrake below, being more easily observed than others.) And if the front of the arrival wave is so regular the crest or average ought to be still more so.

I have rather special opportunities for observation, and the following notes, though not very extensive, show all but one event to occur within 8 days of the average and half of them within 4 days. I insert the Chaffinch date because in his singing he seems an example of utterly ignoring the weather, even heavy frost and snow. I wonder why the Corncrake date is 10 days earlier than the N.H.J. date. N.H.J. means average of 20 years' observations in Great Britain, 1877-1896, recorded in the *Natural History Journal.*

| N.H.J. | | Average Date | Variation from Average | Years Observed |
|---|---|---|---|---|
| — | Chaffinch, sings .. | Feb. 6 | +4 −4 | 7 |
| — | Ringed Plover, inland.. | Feb. 23 | +5 −3 | 5 |
| April 4 | Chiffchaff .. .. | April 2 | +7 −5 | 9 |
| April 13 | Willow Wren .. .. | April 14 | +7 −8 | 7 |
| May 1 | Corncrake .. .. | April 21 | +4 −4 | 10 |
| April 21 | Cuckoo .. .. .. | April 25 | +6 −4 | 8 |
| April 27 | Sandpiper .. .. | April 26 | +6 −6 | 5 |
| May 5 | Swift .. .. .. | May 1 | +3 −4 | 6 |
| April 28 | Grasshopper Warbler .. | May 3 | +11 −9 | 6 |
| April 24 | Sedge Warbler .. .. | May 4 | +4 −2 | 6 |
| April 23 | Whitethroat .. .. | May 7 | +2 −3 | 6 |
| May 8 | Spotted Flycatcher .. | May 7 | +2 −4 | 5 |
| — | Common Tern .. .. | May 11 | +3 −6 | 6 |

J. P. Burkitt.

Enniskillen.

### Russet variety of Snipe in Mayo.

On January 5th, 1917, my brother shot a fine specimen of this variety of the Common Snipe. The following are the points of difference in comparison with a common Snipe shot the same day. The most striking difference was that of the plumage. The pale markings of this bird were far more buff-coloured than in the common Snipe, this colour being particularly noticeable on the head and neck. It differed also in build, being much broader across the breast, its neck was shorter and stouter. The legs were much shorter in proportion to the size of the body than in the common Snipe, and did not extend so far beyond the tail. There were fourteen feathers in the tail; the bird weighed $4\frac{5}{8}$ ozs., the wing measuring 5.36 inches and the bill 2.70 inches. The bird was unfortunately not preserved.

ROBERT F. RUTTLEDGE.

Bloomfield, Hollymount, Co. Mayo.

# IRISH SOCIETIES.

## ROYAL ZOOLOGICAL SOCIETY.

Recent gifts include a Pine Marten from Dr. R. R. Leeper, a Parrot from Mrs. Croly, Golden and Amherst Pheasant from Mr. A. Miller. A pair of young Black Bears from Canada have been deposited by Colonel Mitchell (100th Canadian Grenadiers); after the war they are to be given to the 1st and 2nd Battalions of the Leinster Regiment ("Royal Canadians.") The female Gorilla, which had lived in the Ape-house since January 28th, 1917, died on May 25th. We propose to publish an illustrated article on this exceptionally interesting animal.

## DUBLIN MICROSCOPICAL CLUB.

APRIL 11.—The Club met at Leinster House. N. COLGAN (President) in the chair.

Prof. G. H. CARPENTER showed a preparation of the jaws of the Turnip Moth (*Agrotis segetum*), pointing out the modification of the maxillae to form the sucking proboscis, the vestigial maxillary palps, and the minute triangular plates which have been regarded by some students as reduced mandibles.

Sir F. W. MOORE exhibited spines of *Opuntia tunica*, a rather uncommon species of cactus from Mexico. The young spines were covered by a coat or tunic which was cast off as the spines developed. On reaching full development they were armed with numerous strong and formidable hooks which pointed downwards. These hooks were distributed all over the surface of the spines.

# ADVANCES IN IRISH MARINE ZOOLOGY.

## FOURTH REPORT.

BY R. F. SCHARFF, B.SC., M.R.I.A.

It is seven years since I last had an opportunity of commenting on the recent advances made in Irish Marine Zoology.[1] I do not intend to allude to the progress recorded in the papers published in the *Irish Naturalist.* The advances, and truly remarkable they are, which I refer to are the results obtained from the cruises of the steamer attached to the Fisheries Branch of the Irish Department of Agriculture and Technical Instruction. Within the last few years these operations have been suspended owing to the war, but just before that time the zoologists associated with the Fisheries Branch have displayed great activity in collecting materials for a large number of most valuable reports. The additions thus made to our knowledge of the Irish fauna far exceed previous attempts in the same direction. Twenty-five of these reports will now be quoted, although some of them are not strictly speaking of a zoological nature. The last of the reports was issued in 1915,[2] and there is material in hand for many more.

General Biology.—A very comprehensive investigation is the survey of the trawling grounds on the coasts of Down, Louth, Meath and Dublin. To judge from the two parts published the results will be of considerable importance to Irish fisheries. It is intended to complete the work in four parts, the two issued being Part I. by E. W. L. Holt,[3] and Part III. by Anne L. Massy.[4]

Mr. Holt informs us that the survey was undertaken with a view to obtaining some knowledge of the condition

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[1] *Irish Naturalist*, April, 1910.

[2] Including *Fisheries, Ireland, Sci. Invest.*, 1914, iv. 1915.

[3] Holt, E. W. L.—Report of a Survey of Trawling Grounds on the Coasts of Counties Down, Louth, Meath and Dublin. Part I. Record of Fishing operations. *Fisheries, Ireland, Sci. Invest.*, 1909, i. [1910].

[4] Massy, Anne L.—Report of a Survey of Trawling Grounds on the Coasts of Counties Down, Louth, Meath and Dublin. Part III., Invertebrate Fauna. *Fisheries, Ireland, Sci. Invest.*, 1911, i. [1912].

of these fishing grounds, for they had for a long time been a bone of contention between the various classes of fishermen by whom they are exploited. The enterprise was a formidable one, and it cannot be expected that such a large undertaking could be carried out so as to be in every respect satisfactory. Only a single steamer is available for the protection, inspection and investigation of the Irish Fisheries, and a work of that nature makes many calls upon the energies of this vessel. Almost the whole of Mr. Holt's report consists of "Trawling Records." The various kinds of fish taken are denoted as far as possible by vernacular names. This in itself is of interest to the Irish naturalist, who finds often considerable difficulty in identifying local names of fish. Thus the "Tub Gurnard" is generally known among Irish fishermen as "Latchet," the Long Rough Dab as "Smeareen," and so forth.

Miss Massy's report appeals even more to the zoologist. The invertebrate organisms observed are roughly divided into burrowing, fixed, and wandering categories, and the records of the various hauls abound in facts of faunistic value. Special attention of course has been paid to species of economic importance, such as the so-called Dublin Bay Prawn (*Nephrops norvegicus*), and there are some interesting notes on the distribution of species.

For the purpose of tracing the migration of fishes and other economic organisms a knowledge of the salinity and temperature of sea-water is of special significance. Mr. Matthews[1] was charged therefore with the investigations bearing on this subject. Mr. Matthews shows in his report that the tides exert a great influence on the distribution of salinity and temperature in the Irish Channel. A current of salt warm water sweeps up the Irish Channel from the mouth of the English Channel. Part of it is deflected westward by a cyclonic circulation, the remainder escaping northward through the Irish Channel.

In order to test the assertion that the establishment

[1] MATTHEWS, DONALD J.—The Salinity and Temperature of the Irish Channel and the Waters South of Ireland. *Fisheries, Ireland, Sci. Invest.*, 1913, iv. [1914].

of a whaling station on the coasts of Ireland was detrimental to the fishing industry, it was decided to make a survey of the Blacksod Bay fishing grounds where it was proposed to erect such a station. The latter was started in 1910, while the grounds referred to were surveyed before and after that date. The report by Mr. Farran[1] discusses the results of these operations. His conclusions are that except in the small area of the bay adjoining the whaling station there has been no alteration among the marine animals or plants. Hence we possess fairly reliable evidence that no injurious effect to the fishing industry results from the establishment of a whaling station. A number of well-known naturalists aided Mr. Farran in his work, and the report is particularly valuable in connection with the similar survey carried out further south around Clare Island.

FISHES.—In my last article (*Irish Naturalist,* April, 1910) I alluded to two reports on the fishes of the Irish Atlantic slope. Four more have since been published, all written by Messrs. Holt and Byrne. One of them[2] treats of the very curious and little known "Rabbit fishes" or Chimaeras. Three different kinds are described, viz., *Chimaera monstrosa, C. mirabilis* and *Rhinochimaera atlantica.*

The next report[3] contains a useful list of all the species of fishes that have been recorded so far from the Irish Atlantic slope by various authors. The list comprises only such species which have been taken in nets beyond the hundred-fathom line. There are over a hundred different kinds of fishes, some of them having only been captured once.

Above this great Atlantic slope far away from the west coast of Ireland we meet with a set of extremely curious

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[1] FARRAN, G. P.—Results of a Biological Survey of Blacksod Bay, Co. Mayo. *Fisheries, Ireland, Sci. Invest.*, 1914, iii. [1915].

[2] HOLT, E. W. L., and L. W. BYRNE.—Third Report on the Fishes, of the Irish Atlantic Slope—the Holocephali or Chimaeras. *Fisheries Ireland, Sci. Invest.*, 1908, iv. [1910].

[3] HOLT, E. W. L., and L. W. BYRNE.—Fourth Report on the Fishes of the Irish Atlantic Slope.—List of Recorded Species with References. *Fisheries, Ireland, Sci. Invest.*, 1908, v. [1910].

fishes.[1] They are very active pelagic forms, difficult to catch and somewhat herring-like in shape. The most striking feature they possess is a series of numerous luminous organs on the head and body. When alarmed or in any way disturbed these fish are able to obscure or switch off as it were the light issuing from these tiny lamps. Seven different kinds of fishes belonging to the genus Scopelus were observed.

The last of this series of reports[2] deals mainly with fishes from great depths of the ocean. Most of these fishes have fantastic shapes and large mouths. The eyes are often large, sometimes they are quite minute. The body is frequently scaleless, while luminous organs are generally present. Some species like *Maurolicus Pennanti* stray into shallow water, whereas the members of the genus Argyropelecus are truly pelagic in their habits. The curious *Lamprotoxus flagellibarba* has a filament many times the length of its whole body attached to the lower jaw. This fish is quite new to science. An interesting note on its luminous organ is given by Mr. C. L. Boulenger. *Bathylagus euryops*, formerly described by Holt and Byrne as *B. atlanticus*, is related to the salmon.

That the freshwater eel, which is of such economic value, spawns in the sea, where the early stages of its development take place, was definitely ascertained some years ago. A few problems relating to the subsequent movements of the eel fry still await elucidation. With a view to solving some of these, tables of queries were issued by the Department. Mr. Hillas's two reports[3] contain the printed replies to these which throw a certain amount of light on these movements of the eel fry.

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[1] Holt, E. W. L., and L. W. Byrne.—Fifth Report on the Fishes of the Irish Atlantic Slope.—Fishes of the genus Scopelus. *Fisheries, Ireland, Sci. Invest.*, 1910, vi. [1911].

[2] Holt, E. W. L., and L. W. Byrne.—Sixth Report on the Fishes of the Irish Atlantic Slope.—The Families Stomiatidae, Sternoptychidae and Salmonidae, with a note on the luminous organs of Lamprotoxus flagellibarba by C. L. Boulenger. *Fisheries, Ireland, Sci. Invest.*, 1912, i. and ii. [1913].

[3] Hillas, A. B. E.—Summary of Reports relative to Eel Fry, 1908-9 and 1909-10. *Fisheries, Ireland, Sci. Invest.*, 1908, vi. [1910],and 1909, ii. [1911].

Mr. Farran supplies a further instalment of his Plaice-marking experiments.[1] I have already alluded to them in my former article, and need not repeat the statements contained therein. A smaller number of the marked fish were recaptured than in previous years.

MOLLUSCS.—In my former article I also referred to Miss Massy's report[2] on the Cuttle-fishes (Cephalopoda) of the coasts of Ireland. The same author now makes some necessary corrections to her list. The rare *Teuthowenia megalops* has been added to the species occurring in the Irish marine area. Another species, viz., *Doratopsis vermicularis,* has had to be withdrawn.

Some people imagine that the age of an oyster is easily ascertainable by counting the rings on its shell. If correct this discovery would be of some commercial advantage to oyster growers. But it is only a theory which had not been seriously tested until Miss Massy[3] devoted herself to it. Her conclusions are that it is not possible to tell the age of an oyster with any degree of certainty by counting the concentric rings on the shell.

CRUSTACEANS.—The tiny shrimp-like Crustaceans known as "Schizopoda" are of considerable economic importance since they form a large constituent of the food of fish. Two reports on the species occurring on the Atlantic slope were published some years ago. More material has accumulated since that time so as to enable Dr. Tattersall[4] to furnish us with another instalment of his researches on these small Crustaceans. Eight species new to science are now described from the deeper waters and several forms which had not previously been known from the Irish marine area. It is of interest to note that *Michthyops parva* and *Hansenomysis fyllae,* which had only been recorded from about 100 fathoms off the west

[1] FARRAN, G. P.—Plaice Marking Experiments on the East Coast of Ireland in 1907. *Fisheries, Ireland, Sci. Invest.*, 1910, v. [1911].

[2] MASSY, ANNE L.—Further Records of the Cephalopoda Dibranchiata of the Coasts of Ireland. *Fisheries, Ireland, Sci. Invest.*, 1912, v. [1913]

[3] MASSY, ANNE L.—Notes on the Evidence of Age afforded by the Growth-rings of Oyster Shells. *Fisheries, Ireland, Sci. Invest.*, 1913, ii. [1914].

[4] TATTERSALL, W. M.—Schizopodous Crustacea from the North-east Atlantic Slope. Second supplement. *Fisheries, Ireland, Sci. Invest.*, 1910, ii. [1911].

coast of Greenland, are among the species living at a depth of 900 fathoms near the Irish coast.

Several groups of the larger forms of Crustaceans are dealt with in a report by the late Mr. Selbie.[1] It is with feelings of sadness that I peruse the pages of his descriptions to which he devoted such care and industry. The illustrations, all drawn by himself, are a good example of his artistic merit. Four species are described as new to science and there are sixteen additions to the Irish marine fauna. The majority of these were taken in deep water. The discovery of *Iaxea nocturna* adds another instance to the curious faunistic links between the far-distant Adriatic and the northern seas. Mr. Selbie also describes a new kind of Spiny Lobster. As regards the Common Lobster it is satisfactory to note that the number and value landed in Ireland are steadily increasing from year to year, the catch amounting now to over half a million.

Still another group comprising the more active shrimp-like Crustaceans are treated by Mr. Kemp.[2] Bags of sprat and mosquito netting attached to the beam trawl have been chiefly instrumental in the capture of most of these. As the previous records of this particular group (Decapoda Natantia) from Irish waters are few, Mr. Kemp has incorporated all references to scarcer forms in the present paper. It makes his report all the more valuable to zoologists. Of the 54 species known to occur in the British and Irish marine area not less than 47 have been found off the Irish coasts. No new species are described.

Worms.—The English term "worms" includes a great variety of forms for which no other convenient word is applicable. The Spoon Worms (Gephyrea) are a group of worms confined to the floor of the sea, where they live as a rule buried in the sand or mud. Twenty-three species

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[1] Selbie, C. M.—The Decapoda Reptantia of the Coasts of Ireland. Part I. Palinura, Astacura and Anomura (except Paguridea). *Fisheries, Ireland, Sci. Invest.*, 1914, i. [1914].

[2] Kemp, Stanley.—The Decapoda Natantia of the Coast of Ireland. *Fisheries, Ireland, Sci. Invest.*, 1908, i. [1910].

are described by Mr. Southern,[1] of which eleven were hitherto unknown, from the British and Irish marine area. Six of these are new to science. One of the most noteworthy facts brought to light by Mr. Southern is the discovery of a deep-water Physcosoma off the west coast of Ireland. The whole of this valuable collection, including the type specimens, has been deposited in the National Museum of Ireland.

Very distinct from the last group are the active Chaetognatha,[2] which are free-swimming worm-like organisms. They are difficult to determine, and little attention had been given to them in Ireland hitherto. They had to be sent to a German specialist who describes twelve species.

The Bristle-worms (Polychaeta) form still another group of worms. There are three reports on different sections of this large and varied group. Dr. Ashworth[3] deals with the two families Arenicolidae and Scalibregmidae. The first of these includes our well-known lug-worm. No member of the other family had previously been discovered in Irish waters. Dr. Ashworth records the two species *Scalibregma inflatum* and *Lipobranchias Jeffreysii.*

Mr. Southern[4] reports on the pelagic Phyllodocidae. No species of the sub-family referred to had hitherto been recorded from the British and Irish marine area, so that all are additions to our fauna. Several are new to science.

Another section of pelagic worms is included in the sub-family Alciopinae and in the families Tomopteridae and Typhloscolecidae.[5] All these live in the warm and saline waters of the European branch of the Gulf Stream. Mr. Southern describes twelve species, of which all but two are new to the British and Irish marine area.

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[1] SOUTHERN, R.—Gephyrea of the Coasts of Ireland. *Fisheries, Ireland, Sci. Invest.*, 1912, iii. [1913].

[2] RITTER-ZAHONY, R. von.—Chaetognatha from the Coasts of Ireland. *Fisheries, Ireland, Sci. Invest.*, 1910, iv. [1910].

[3] ASHWORTH, J. H.—Polychaeta of the Coasts of Ireland. I.—Arenicolidae and Scalibregmidae. *Fisheries, Ireland, Sci.Invest.*, 1908, ii. [1909].

[4] SOUTHERN, R.—Polychaeta of the Coasts of Ireland. II.—Pelagic Phyllodocidae. *Fisheries, Ireland, Sci. Invest.*, 1908, iii. [1909].

[5] SOUTHERN, R.—Polychaeta of the Coasts of Ireland. III.—The Alciopinae, Tomopteridae and Typhloscolecidae. *Fisheries, Ireland, Sci. Invest.*, 1910, iii. [1911].

The least worm-like of all the groups generally included under the term "worms" are the Sea Mats or Polyzoa, which are popularly regarded as akin to sea-weeds. Many of these are found encrusting stones, shells and other objects both in shallow and deep water. During the course of various cruises of the Department's steamer much material was dredged, and this yielded a good harvest of Polyzoa. These are described by Mr. Nichols.[1] A variety of *Brettia pellucida* is new to science.

ECHINODERMS.—Star-fish, brittle-stars, feather-stars and sea-urchins all belong to one great group of invertebrates (Echinoderma). The shallow-water forms of the Irish marine area are fairly well known, but among the deep-sea species there is still a great field for research. The present report by Mr. Farran[2] gives an account of the species that have been taken in depths greater than 50 fathoms. No less than 69 species are enumerated, of which 18 are new to the Irish marine area. *Ophiacantha hibernica* and *O. densa* are new to science. Many others are extremely rare.

The feather-stars constitute only a small section of the great group of Echinoderma, and Mr. Clark[3] of the U.S. Museum in Washington undertook to examine the Irish captures. Altogether there were only eight species, but two of these proved to be new to science. The genus Atelecrinus, to which one of these belongs, had never been observed outside the tropics, and the new species *A. Helgae* seems to be nearly related to the West Indian *A. balanoides*.

COELENTERATA.—A curious case of "symbiosis," as it is called, or "living together" of two very distinct forms of animal life was discovered during these investigations. Dr. Ritchie[4] noticed that what were apparently blisters on a deep-sea mollusk were in reality the early stages of a

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[1] NICHOLS, A. R.—Polyzoa from the Coasts of Ireland. *Fisheries, Ireland, Sci. Invest.*, 1910, i. [1911].

[2] FARRAN, G. P.—The deep-water Asteroidea, Ophiuroidea and Echinoidea of the West Coast of Ireland. *Fisheries, Ireland, Sci. Invest.* 1912, vi. [1913].

[3] CLARK, AUSTIN H.—On a collection of recent Crinoids from the waters about Ireland. *Fisheries, Ireland, Sci. Invest.*, 1912, iv. [1912].

[4] RITCHIE, JAMES.—A new British Commensal Hydroid, Perigonimus abyssi, Sars. *Fisheries, Ireland, Sci. Invest.*, 1913, i. [1913].

"hydroid," which is a relation of the well-known jelly-fish. The same species of hydroid was known from the Arctic and sub-Arctic regions where it also spends its youthful existence in a similar manner.

SPONGES.—Very few kinds of Irish sponges are of economic interest and none of them seem to be useful to mankind. Yet it is quite possible that some of them may prove to be of commercial value at some future time. Miss Stephens[1] deals with several sections of sponges, most of which were obtained in deep water. Among the most interesting records are the cup-shaped *Hyalonema infundibulum* and the sponge like a bird's nest, *Pheronema Grayi*. Both of them had only been previously known from the great depths of the Bay of Biscay and the neighbourhood of the Azores. Several species are described as new to science.

National Museum, Dublin.

# OBITUARY.

## ROBERT DONOUGH O'BRIEN.

By the death of R. D. O'Brien, which occurred on April 9th, Irish natural history has lost one of the keenest and most helpful supporters. During a long life he was a close observer of nature, and had a wide if not technical knowledge of the fauna and flora of the district which lay around his home at Limerick. To botanists his name is familiar as the discoverer of the rare *Scirpus triqueter* in Ireland, and the collector of strong evidence in favour of the contention that *Leucojum aestivum* is truly native in its home in the Shannon marshes. He was interested in zoology also, and supplied useful data regarding such problems as that of the Wild Cat in Ireland, and the Irish Wolf-hound. Mr. O'Brien was one of the most helpful, as he was one of the most modest, of men, and the extent to which he benefited Irish natural science extends far beyond the few contributions to the subject which appeared over his own name. He left all workers who visited his district under a deep debt of gratitude to him for valuable advice and assistance.

R. LL. P.

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[1] STEPHENS, JANE.—Sponges of the Coasts of Ireland. I.—The Triaxonida and part of the Tetraxonida. *Fisheries, Ireland, Sci. Invest.* 1914, iv. [1915].

# ENTOMOLOGICAL NOTES.

BY SIR CHARLES LANGHAM, BART., M.R.I.A.

Early in the summer of 1914 I decided to make an expedition to Co. Clare, my chief object being to obtain specimens of *Zygaena pilosellae* and *Platyptilia tesseradactyla*. I left home on the 13th of June, accompanied by my wife and one of my gardeners, who had often collected for me and proved very useful on other entomological trips. We motored all the way, a matter of some 160 miles; the weather was perfect, but the roads left much to be desired, particularly in Galway. Unfortunately we had two punctures and a burst tyre, which delayed us considerably, so that it was 7 o'clock that evening before we reached Ballyvaughan in the Burren of Clare, which we made our headquarters. *Zygaena pilosellae* was so plentiful that it would have been impossible to overlook it; but *Platyptilia tesseradactyla* would in all probability have escaped our notice had it not been for the kindness of Mr. de Vismes Kane, who had previously given me minute directions as to the most likely localities in which to find it; and by closely following his advice we were successful in obtaining a few specimens. During the ten days of our stay the weather was uniformly good and very hot, and having the motor we were able to cover a good deal of ground, and explore the coast some twenty miles on each side of Ballyvaughan. What particularly astonished me was the large number of insects on the wing during the daytime. We did very little work at night, comparatively speaking, as we were all tired after the day's excursions, and setting the captures took up all my time during the evenings and early mornings; however, my man sallied forth most evenings and procured some good things.

The following is a list of the rarer species obtained in this neighbourhood:—

**Leucophasia sinapis.**—Three specimens obtained near the town on June 14th.

**Argynnis aglaia.**—One freshly emerged taken on June 16th.

**Lycaena minima.**—Extremely common but rather local.

**Choerocampa porcellus.**—Very plentiful at Valerian flowers in a garden at the back of the hotel.

**Sesia musciformis.**—Two nice specimens, freshly emerged: the first one I noticed close to my hand, as I leant over the bank, admiring the view on the Cliffs of Moher; and on searching, we found the second one on Wild Thyme; unfortunately it was getting late in the afternoon, and we could not wait to look for others.

**Zygaena pilosellae** var. **nubigena.**—Very abundant in several localities, and in nice condition, just emerging the day we arrived at Ballyvaughan.

**Setina irrorella.**—Fairly common but very local.

**Nemeophila plantaginis.**—Common, but owing to the hot sun extremely lively, and difficult to take on the wing.

**Dasychira pudibunda.**—One specimen taken at light.

**Xylophasia sublustris.**—One at light on June 18th.

**Phothedes captiuncula.**—Common on the cliff sides, but difficult to see owing to their rapid flight, and quite disappearing whenever the sun was behind a cloud. Fond of sunning themselves on the rocks, but very shy of approach.

**Dianthoecia, sp.**—We collected a quantity of larvae from *Silene maritima* seed pods; but unfortunately they escaped before I could ascertain to which species they belonged.

**Hadena contigua.**—One near Ballyvaughan.

**Habrostola triplasia.**—A few at Valerian flowers at dusk.

**Euclidia glyphica.**—A few worn specimens seen.

**Zanthognatha tarsipennalis.**—One only, in a field near the town.

**Venilia macularia.**—Fairly common near Ballyvaughan and Kinvarra.

**Dasydia obfuscaria.**—A beautifully fresh specimen flying to my man's lamp, was taken in a field near Ballyvaughan.

**Strenia clathrata.**—Locally common. My man captured a black variety of this moth, on the road to the Cliffs of Moher, all the wings being black, except the fringes and a small patch at the base of each wing.

**Emmelesia adaequata.**—A few taken in a lane near the town of Ballyvaughan.

**Eupithecia venosata.**—Two specimens of the smoky form taken on the shore near Ballyvaughan.

**E. scabiosata.**—Common near Blackhead.

**E. constrictata.**—A few taken near Ballyvaughan.

**E. exiguata.**—Two captured at Blackhead.

**Melanippe tristata.**—Common locally on the coast round Blackhead.

**M. galiata.**—Common along the coast but local.

**Anticlea cucullata.**—I was fortunate in obtaining three specimens of this rare moth, one near Kinvarra and two near the spot where Mr. Kane obtained his specimen some years before, viz., on the walls round Gleninagh Castle, Ballyvaughan.

**Camptogramma bilineata.**—Very common; I took some nice dull-coloured forms.

**Rhodaria sanguinalis.**—Common locally along the Burren coast.

**Ennychia cingulata.**—I took a nice series of this rare species in a field not far from Kinvarra.

**E. octomaculata.**—Locally common near Ballyvaughan.

**Eurrhypara urticata.**—Mr. Kane in his "Catalogue of the Lepidoptera of Ireland" says, "Common everywhere." Personally I have never seen it in Ireland, though I have collected for many years and in a good many counties. However, I came across a colony on nettles which were growing in the rooms in a large derelict and roofless house near Ballyvaughan.

**Platyptilia tesseradactyla.**—We took two specimens in a field near Kinvarra, and nine more in a field not far from Ballyvaughan on June 17th.

**Aciptilia tetradactyla.**—Abundant in several localities along the Burren coast.

**Crambus pinellus.**—We took several flying at night in a field near Ballyvaughan, and secured a few during the daytime by beating hazel and thorn bushes in the same field.

**C. perlellus.**—Extremely common, also the variety Warringtonellus; I took one with all the wings of a slate colour.

**Aspis udmanniana.**—One near Kinvarra.

**Hyponomeuta padella.**—In some spots along the coast the larvae and cocoons were in thousands, their webs completely covering the thorn bushes, which they had entirely denuded of their leaves.

**Hypercallia christiernella** (*citrinalis*).—One taken near Ballyvaughan; I believe this to be "new" to Ireland.

We left Ballyvaughan on the 22nd of June and motored *via* Galway and Recess to Roundstone, where we were forced to stay three days owing to a broken spring on the motor. I was greatly disappointed with Roundstone as a locality for Lepidoptera, only the commonest species having been obtained, and even these were numerically scarce. Leaving Roundstone, we journeyed through Connemara; near Doo Lake we came upon a large colony of *Melanippe hastata*, and passing on through Westport and Castlebar we arrived about 7 o'clock the same evening at Pontoon on Lough Cullin in Co. Mayo, where we stayed at the hotel for some days. On June 28th we explored Nephin Mountain in the hopes of obtaining *Erebia epiphron*. However, the day was cloudy and rather cold, and we saw no insects at all there except one *Argyrolepia hartmanniana*.

While at Pontoon we obtained the following besides taking some commoner species:—

**Gonopteryx rhamni.**—One rather worn specimen on an island on Lough Conn on June 24th.

**Coenonympha typhon.**—Very abundant.
**Nemeophila russula.**—Very common; I took a nice series of females.
**Odonestis potatoria.**—Fairly common.
**Cymatophora or.**—We took two or three regularly each evening at treacle
**C. fluctuosa.**—One very worn specimen obtained by beating.
**Bomolocha fontis.**—Very common in the woods.
**Hypenodes costaestrigalis.**—One taken flying at dusk on June 27th.
**Zonosoma pendularia.**—One beaten out of a birch bush.
**Venusia cambrica.**—Several taken in the woods near Pontoon.
**Acidalia immutata.**—One only. I spent some time hunting for others but was unsuccessful.
**Emmelesia taeniata.**—We secured two specimens and saw several others, but owing to the thick undergrowth of the wood in which they were they managed to escape.
**Eupithecia debiliata.**—A few specimens were captured in the woods.
**Melanippe hastata.**—A few only were taken.
**Eucosmia undulata.**—Fairly abundant in the woods around Pontoon and near Foxford.
**Cidaria fulvata.**—One or two taken near Pontoon.
**Tortrix podana.**—I took one on an island on Lough Conn on June 18th.
**T. viridana.**—One on the same island and at the same time.

On visiting Pontoon again in June, 1916, I obtained another *Cymatophera fluctuosa*, a freshly emerged specimen, also a series of *Acronycta leporina* at treacle. This time I found *Melanippe hastata* abundant, and took two varieties, the black markings on all the wings of one specimen being much suffused, and in the other the hind wings differing from each other in the extent of the black scaling. I also captured *Drepana falcula* by beating; a species I had already obtained a few days before in Co. Tyrone.

In June, 1915, I came across in Tempo demesne five newly emerged specimens of the yellow variety of *Euchelia jacobaeae* in which the crimson on all the wings was replaced by yellow.

I obtained at Lough Gill in Co. Sligo in July of 1915 *Schoenobius mucronellus*, a moth I had taken on Lough Erne and also at Tempo some years previously.

Also through the kindness of the late Mr. J. E. R. Allen I was able to obtain a series of *Larentia flavicinctata* and *Phibalapteryx lapidata*, both of which species Mr. Allen had lately discovered in the Fermanagh mountains.

Tempo Manor, Co Fermanagh.

# THE WINTER OF 1916-17 AND ITS EFFECT ON BIRD-LIFE IN CO. DOWN.

BY NEVIN H. FOSTER, M.B.O.U.

Mr. C. B. Moffat's account (p. 89 *ante*) of the effects of the severe winter of 1916-17 on the avifauna of Co. Wexford gives a vivid picture of the exceptional conditions there prevailing. The weather in North-East Ireland, though severe, presented a great contrast to that experienced in the South-East. The meteorological data at my disposal are rather meagre, but from my few notes and recollections it may be taken that the following conditions obtained here. December :—Till middle of month mild, 15th-20th hard frost, 20th thawing (on this day we had lightning and thunder), from 20th till end of month a succession of short frosts and thaws. January :—Weather during this month not severe—several sharp frosts which however only lasted for a few days. February :—Intermittent frosts of short duration. March :—2nd heavy snow-fall which had all melted next day, 5th renewed snow-fall followed by sharp frost, 7th-10th frequent snow showers, 10th till end of month weather not severe, 31st thunderstorm followed by severe frost. April :—5th heavy snow-fall which quickly melted, 5th-9th frequent snow showers, on morning of 10th about 6 inches of snow on ground most of which disappeared before nightfall, during the following night snow again fell, and on morning of 11th the snow was 11 inches deep—the thermometer registering a temperature of 20° F., by the 14th the snow had disappeared, but for the next few days there were frequent snow showers.

Naturally the effect in bird-life has not been so pronounced as that observed by Mr. Moffat, but, at least in the cases of the Stonechat, Golden-crested Wren and Long-tailed Titmouse, it appears as if there had also been a diminution in numbers in this district which may be taken as a roughly circular area of about 5 miles in diameter with Hillsborough as centre. One of the most notable observations of the winter here was the scarcity of Fieldfares. This bird is usually present in large numbers from

November till April, but this season till the middle of January a flock of even 10 birds was not seen. From that time onwards there appeared to be an increase but it never attained anything near the normal numbers. Redwings were much more numerous than Fieldfares though these also were somewhat less numerous than usual.

In respect to the five species which the winter has exterminated in Mr. Moffat's neighbourhood I give their status and apparent present position here.

STONECHAT :—In this district there are only a few pairs which appear to confine themselves to strictly limited areas except in winter when they sometimes wander further afield. Frequent visits to their haunts this year have not revealed the presence of a single bird—in fact, with the exception of one female seen in an unlikely locality in November, I have not seen this bird since last August.

GOLDEN-CRESTED WREN :—This bird has always been regarded as numerous here, but during the past winter and since it seems practically to have disappeared.

LONG-TAILED TITMOUSE :—This species is resident here in small numbers, but since December I have failed to detect its presence.

GREY WAGTAIL :—A few pairs reside in the district generally keeping to the banks of some of our streams and ponds. The status of this species here is apparently unchanged.

MEADOW-PIPIT :—This species (universally known here as "Moss-cheeper") is common all through the district and its numbers apparently show no change. I have not noticed the brighter plumaged birds come to the district in spring, and consider the number of individuals to remain fairly constant the year round (allowing for the substantial increase of young birds during the summer). Its song was first heard this year on 1st April.

There is no noticeable change in the number of any of our other birds, and the dates of arrival of our regular spring migrants are, with the exception of two, about the normal. The Chiffchaff usually arrives here about the beginning of April, but this year it was not observed till

23rd April. The Willow-Wren was first noted this year on 24th April—fully a fortnight behind its usual time.

Hillsborough, Co. Down.

# NOTES.

## BOTANY.

### Effects of the late Spring.

A conspicuous effect of the severe winter and late spring has been an upsetting of the date of flowering of spring plants; and some species have been much more retarded than others, as the following examples will show. At Aughrim, Co. Wicklow, on May 20th, Blackthorn and Hawthorn were flowering together, accompanied by Broom. Lesser Calendines were still abundant, though Wild Hyacinths were already in bloom. I already noted in these pages the mortality of Foxgloves in that area. Gorse has also suffered very severely, about two-thirds of the bushes being killed, at least in the upper parts. Whole hillsides, which last year were sheets of gold, were this year brown and lifeless. The destruction of Gorse perhaps followed the course of the great snowstorm for on June 2nd the hillsides of the Carlingford range above Dundalk, were golden with Gorse apparently uninjured—a very late date for such abundant flowering.

Dublin. R. Lloyd Praeger.

### Blue Wood Anemones.

In the valley between Aughavannagh and Ballymanus Bridge, in Wicklow, we lately found a variety of colour-forms of the Wood Anemone, distributed over several miles of county. The most marked were of a fine deep blue—just the deep greyish blue of *Hepatica triloba*. Others were paler and of large size, resembling the vars. *Robinsoniana* and *Alleni* of gardens. Others again were purple, owing to the presence of red pigment on the back and blue on the face of the sepals. There were also very large creamy forms, or white with a red reverse. On enquiry, Sir F. W. Moore pointed out at Glasnevin a good blue form sent by The O'Mahony from this district some years ago, and grown there as the Mucklagh variety. In the National Herbarium there are blue specimens collected by R. M. Barrington in 1904 at 1,000 feet on the west side of Ballinabarry Gap—that is about seven miles W.N.W. of the previous stations. Sir F. Moore was in the neighbourhood a week after our visit, and extended the area of the blue Anemones some miles to the south-west. There would appear, therefore, to be a wide area around Aughavannagh in which the Wood Anemone varies in this unusual way.

Dublin. R. Lloyd Praeger.

## ZOOLOGY.

### Habits of Vanessa io in Co. Donegal.

The Peacock Butterfly (*Vanessa Io*), here formerly all but unknown has within recent years become, not indeed common, but much less rare. A few now haunting the lawn and garden, and remaining unmolested, are getting to be quite familiar. It is interesting to observe their marked preference for the flowers of the Primrose, which for most species of Lepidoptera appear to have little attraction; the only others of which I remember to have seen visiting them having been the Humming-bird and the Bee Hawk-Moths. After close observation of its behaviour whilst feeding, one is inclined to regard the Peacock Butterfly as a fairly efficient agent in the pollination of the Primrose. When alarmed, this insect has the habit of flying to the nearest patch of dug ground, where, closing its wings, it at once becomes invisible.

W. E. Hart.

Kilderry, Co. Donegal.

### Hadena protea in Tyrone.

Last autumn (1916), a single example of this species turned up here at sugar, close to the garden where there a few small oak trees. In a demesne near here full of fine oak timber I have collected for many years and never met with this species, which still appears to be very rare in Ireland.

Thomas Greer.

Stewartstown, Co. Tyrone.

### Variation in Arion ater in Cork North-East.

My friend Ernest Stainton, B.Sc., who is at present a signaller in the 2/6th Battalion Scottish Rifles, in camp at Kilworth, in vice-county 146 N.E., Cork North-east, is employing his leisure in collecting Mollusca, and has sent me a number. One interesting consignment just received, collected at Glanworth, under stones and decaying coffin-boards in the churchyard, on 21st April, showed the remarkable extent of colour-variation so prevalent in the South-west of Ireland. There were about a dozen *Arion ater*, all about a quarter-grown, including a few var. *fasciata* one var. *livida*, a few var. *succinea*, a few very richly-coloured var. *rufa*, and one very characteristic var. *bicolor*. With them were various shelled species, *Hyalinia lucida* in abundance, and an adult example of *Helix nemoralis* var. *albina* 003/00, in which the band is well-defined, brown-black, edged closely by a very fine line, a split-off. On the way between Kilworth and Glanworth Signaller Stainton found a half-grown example of typical *Limax flavus*, a species not often found in the open, away from human habitations.

May I add how pleased I shall be if Irish naturalists will assist in the rapid completion of the Conchological Society's Census of Distribution, by permitting me to see slugs and snails from every part of Ireland, for which part of the kingdom the blanks still to be filled up are very numerous.

W. Denison Roebuck.

259 Hyde Park Road, Leeds.

## Fish Diseases.

Two important contributions towards our knowledge of fish diseases published within recent years in Ireland have not yet been alluded to in the pages of the *Irish Naturalist*. The first of these is a paper by L. von Betegh of Fiume in Austria on yolk-sac dropsy (Hydrocoele embryonalis. *Fisheries, Ireland, Sci. Invest.*, 1913, iii. [1913]). This epidemic disease affects trout alevins in fish-breeding establishments. It appears very suddenly, and first attracts attention by the swollen yolk-sac which seems to weigh down the little fish, which drops to the bottom of the hatching tank. Later on the yolk-sac bursts and the fish dies. The disease is due to bacteria (*Diplobacillus liquefaciens piscium*) but no remedy has as yet been discovered to combat it.

The second paper (A. E. Mettam—Report on the outbreak of Furunculosis on the River Liffey in 1915, *Fisheries, Ireland, Sci. Invest.*, 1914, ii. [1915]) deals with a disease known as furunculosis, which produces abscesses or boils in freshwater fish. A serious outbreak of this disease occurred some years ago in the River Liffey among salmon. Prof. Mettam now describes the nature of the disease which he traces to *Bacillus salmonicida*. It is probably the same ailment which was investigated by Dr. E. J. McWeeney many years ago. The most obvious remedy to prevent the undue spreading of such disease is to remove any affected fish from the water and destroy them. Great care should also be taken when introducing fish eggs or fry from places where this disease is known to exist.

## Some Migrant Notes.

Under above title Mr. J. P. Burkitt (p. 103 *ante*) gives his observations of Spring Migrants for a series of years. It is well-known that such average would only apply to a certain district and, as a rule, be earlier the more southerly the locality. Appended is a table drawn up from my observations here, and it may be well to state that my "average date" is the mean of the earliest and latest dates of first appearance (this sometimes gives a misleading impression as to the *usual* date of arrival), and that in the "variation from average" + indicates the number of days *later* than average of first observation and — the number of days *earlier*. During the past 15 years my notes show that the song of the Chaffinch has first heard from 17th January till 23rd February.

| | Average Date | Variation from Average | Years Observed |
|---|---|---|---|
| Wheatear .. .. | 1st April | +12 − 9 | 6 |
| Whitethroat .. .. | 4th May | +17 −17 | 17 |
| Chiffchaff .. .. | 9th April | +14 −13 | 17 |
| Willow-Wren .. .. | 13th April | +11 −10 | 17 |
| Sedge-Warbler .. .. | 7th May | + 9 − 8 | 14 |
| Grasshopper-Warbler .. | 11th May | + 9 −10 | 6 |
| Spotted Flycatcher .. | 10th May | + 7 − 8 | 15 |
| Swallow .. .. | 13th April | + 9 − 9 | 17 |
| House-Martin .. .. | 28th April | + 8 − 8 | 14 |
| Sand-Martin .. .. | 17th April | +13 −12 | 16 |
| Swift .. .. | 1st May | +11 −10 | 17 |
| Cuckoo .. .. | 23rd April | +14 −14 | 17 |
| Landrail .. .. | 26th April | + 5 − 4 | 17 |
| Common Sandpiper .. | 3rd May | +15 −17 | 8 |

Hillsborough, Co. Down. NEVIN H. FOSTER.

## Whales and Dolphins stranded in Ireland.

In the *Irish Naturalist* of June, 1915, reference was made to the second Report by Dr. S. F. Harmer on the Cetacea stranded on the British coasts. Two reports have appeared since that date, enumerating the specimens cast ashore in 1915 and 1916. It is of interest to note that several of these animals had been injured probably by gunfire or mines. The following list gives details of the captures on the Irish coasts :—

Cuvier's Whale (*Ziphius cavirostris*), 18ft. 2½in. long. July 18th, 1915, Fethard, Co. Wexford.

Pilot Whale (*Globicephala melaena*), 20 feet long. March 16th, 1915, Dunmanus Bay, Co. Cork.

Dolphin (*Delphinus delphis*), 7ft. 6in. long. December 22nd, 1915, Dunfanaghy Bay, Co. Donegal.

White-sided Dolphin (*Lagenorhynchus acutus*), 9ft. 3in. long. June 9th, 1916, Rathlee, Co. Mayo.

Porpoise (*Phocaena phocaena*), 4ft. long. July 13th, 1916, Fethard, Co. Wexford.

Sperm Whale (*Physeter catodon*), young, 18ft. long. September 4th, 1916, Roundstone, Co. Galway.

Lesser Rorqual (*Balaenoptera acutorostrata*), 22ft. long. October 9th. 1916, Lennan, Co. Donegal.

# IRISH SOCIETIES.

## DUBLIN NATURALISTS' FIELD CLUB.

JUNE 2.—EXCURSION TO FELTRIM HILL AND MALAHIDE.—Members and friends to the number of 25 assembled at Amiens Street terminus and travelled by the 12.30 p.m. train to Portmarnock, when a two miles' walk by the old church of Kinsaley took the party to the top of Feltrim Hill. As the original form of the name shows (Faeldruim—Wolf-ridge) Feltrim is a ridge rather than a hill, an isolated rocky wrinkle in the landscape running east and west for about a quarter of a mile. Rising 190 feet above sea-level, this ridge serves as a pedestal for the massive shaft of an old derelict windmill, familiar as a landmark for many miles around. Here the party took shelter and lunch while a heavy shower swept over the hill accompanied by distant rumblings of thunder. When the sun broke out again the conductor, J. de W. Hinch, assembled the party on the summit of the ridge and with the theme of his discourse spread out below him briefly sketched the geological history of the district.

The conductor's address ended, the geologists scrambling down to the quarry which cuts so monstrous a cantle out of the ridge as to threaten before long to bisect it, busied themselves in fossil hunting, while the smaller botanical section pushed westward over the ridge in quest of the rare plants long known to inhabit Feltrim. The fossil hunters were rather more successful than the botanists. Many specimens of the characteristic brachiopod genera of the Lower Carboniferous Limestone, Productus, Spirifera and Rhynchonella were found together with the cephalopod genus Orthoceras and the polyzoon Fenestella. The botanists found abundance of *Trifolium striatum*, *Viola hirta* and *Orchis Morio* towards the western end of the ridge, but failed in their search for *Geranium lucidum* and *G. columbinum*, perhaps for lack of time to examine the rocks, or because these species, always rare here, have been quarried away.

Soon after 4 o'clock the excursion reached Malahide Rectory where Canon and Mrs. Lindsay having dispensed afternoon tea with most genial hospitality earned the further gratitude of the Club by conducting the large party over their beautiful grounds. The sunken rock-garden stocked with a profusion of alpines, most of them in full bloom, and including the exquisite and not often successfully cultivated *Daphne Cneorum*, won the admiration of all. But the most curious amongst the many rare plants and shrubs pointed out was a well-grown flowering specimen of the *Cytisus Adami*, produced in 1826 by a French grower, M. Adam of Vitry. In the flower of this graft-hybrid, as it is called, a strange intermingling of the characters of *Cytisus purpureus* and *C. Laburnum* (the Common Laburnum) is shown. The precise nature of M. Adams' Laburnum has afforded matter of as heated discussion amongst botanists as has the nature of Oldhamia amongst palaeontologists.

The party returned to Dublin by the 7 p.m. train after a most successful day filled with varied interests.

Gorilla "Empress."
Age, 4-5 years.
Zoological Gardens, Dublin.

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# SOME NOTES ON THE DUBLIN GORILLA.

BY PROF. GEO. H. CARPENTER, M.SC., SEC. R.Z.S.I.

(PLATES III., IV., V.).

For several years past the Gardens of the Royal Zoological Society of Ireland in Phœnix Park, Dublin, have never been without one or more representatives of the Anthropoid Apes—that family (Simiidae) of the order Primates whose members approach most nearly in bodily structure and also in mental characteristics to Man. For no observant person who has had the opportunity of watching the habits of anthropoids can doubt for a moment that their behaviour is far more "human" than that of even such a long-domesticated animal as the dog.

Among the apes on view in the Dublin monkey-house, the Bornean Orang-utan and various species of the Malayan and Burman Gibbons have often been represented, while West African Chimpanzees have been constantly in the collection—frequently two or three individuals at once, these being the most frequently imported and most readily obtained of all the anthropoids. In December, 1906, the Society acquired a young male Gorilla—the other great West African ape whose name has become familiar to most people from the descriptions of travellers and naturalists, and from museum specimens, though very few Europeans have the opportunity of seeing a live example. This young male lived in the ape-house for a few weeks only, and no opportunity of getting another Gorilla presented itself until January, 1914, when a young female was offered for sale by Mr. W. Cross, of Liverpool, who had imported her from the Gaboon along with a young male Chimpanzee. These two apes were purchased by the Society, and they have lived together in the ape-house until 25th May of the present year when the Gorilla died after a residence in Dublin of three years and four months. This is by far the longest period through which a Gorilla has survived in captivity in the United Kingdom. The Zoological

Society of London has had six of these apes in the Regent's Park Gardens at various times between 1887 and 1908,[1] but none of them lived more than a few weeks or months ; the longest residence having been that of a female which survived from March, 1896, until August of the same year.[2] At Berlin there have been several Gorillas on view ; the first, brought from Africa in 1876, died in the autumn of 1877 ; it was a young male and an interesting account of its habits by Dr. Falkenstein is given in Prof. Hartmann's book[3] on the Anthropoid Apes. The second Berlin specimen lived in captivity only a few weeks (1881) ; while a third survived for about a year (1883-4).[4] The length of life in captivity attained by our Dublin female seems to have been exceeded only by the famous specimen at the Breslau Zoological Gardens, which at her death in 1904 had been "naturalised" in Germany for about seven years.[5] That ape, which also had a male Chimpanzee as companion, was about four years old on her arrival in Europe, and had therefore attained an age of eleven years at her death.

When the Gorilla arrived, the Dublin ape-house was already occupied by a Hoolock Gibbon, an Orang and two Chimpanzees, so that visitors had the opportunity, rarely, if ever, offered, of comparing living specimens of all four types of Anthropoids. This remarkable assemblage was terminated in March, 1915, by the death of the Orang, but the other three genera of apes could be studied side by side until the Gorilla's lamented death this year.

Frequenters of the Dublin Zoological Gardens have therefore had unusual opportunities for watching the behaviour of a Gorilla, and some account of the ape's characteristics may well be placed on record. For many of the particulars given in this article I am indebted to Capt. B. B. Ferrar, R.A.M.C., Superintendent of the Gardens, and to Mr. John Supple, the head keeper of our monkey-house, to whose great care of the inmates the survival of the Gorilla through

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[1] R. Lydekker.—"Gorilla" in Encycl. Brit., 11th ed. Cambridge, 1910.

[2] My friend, Mr. R. I. Pocock, F.R.S., has kindly furnished me with some particulars of the London Gorillas that were under his care.

[3] R. Hartmann.—"Anthropoid Apes." London, 1885.

[4] R. Lydekker.—"Royal Natural History," vol. i., 1893 (p. 46).

[5] F. Grabovsky.—*Zeitschr.f. Naturwissenschaften*, vol. xli., 1906, and *Verhandl.d. Gesellschaft Deutsch. Naturforsch.u Aertze*, Breslau, 1904.

Gorilla "Empress."
Age 2 years.
Zoological Gardens, Dublin.

such a comparatively long period is largely due. Before her arrival the Gorilla had been dignified with the name of "Empress," her companion Chimpanzee being called "Charlie." Both apes were apparently more than a year old, but certainly less than two years, in January, 1914, so that at her death "Empress" had probably attained an age of nearly five years. During her residence among us she was closely watched, and many attempts were made to secure good photographs. In this work, Mr. W. N. Allen, who spared neither time nor trouble in order to obtain the best results in light and posture, was highly successful; he kindly allows me to use the three excellent pictures that accompany this article, one of which (Plate IV.) represents "Empress" when about two years old, the other two (Plates III., V.) when between four and five.

Most writers on the habits of the Gorilla describe this ape as morose and savage in disposition, though Falkenstein's specimen, kept first in West Africa and afterwards at Berlin, was docile and playful. "Empress" proved quite docile and never attempted to hurt or bite anyone—simian or human—though she has shown herself distinctly less interesting and friendly than most of the Chimpanzees that have lived in Phœnix Park. The contrast in appearance between the black-skinned, small-eared, broad-nosed Gorilla and the pale-faced, large-eared, comparatively narrow-nosed Chimpanzee is very striking, and the generic distinction between the two types of ape, now generally accepted by systematic zoologists, seems fully justified.

On first taking up her residence in the Dublin ape-house, "Empress" was naturally shy and nervous, but she quickly became accustomed to her surroundings. She was then willing to make friends, in a quiet way, with casual visitors whom she allowed to pat and stroke her, but she strongly resented any attempt (even by the keeper) to carry her about or nurse her. When such attentions were offered she became nervous and greatly distressed. This aversion was noteworthy, because young Chimpanzees delight to rest in the arms of a human friend, and, like small children, often beg by means of voice and gesture to be lifted up and carried about. Also it is well known to frequenters

of the Gardens how delighted the Chimpanzees always are to leave their cage, to roam about the monkey-house, to get out into the grounds and to climb the trees. But "Empress" could never be induced to follow her companion "Charlie" on such rambles; she became accustomed to her house and would never leave it, though she often liked to sit in the doorway when the wire door was thrown open. Apparently having once settled down, she developed a strong conservative tendency, with a suspicion of all things new or strange.

Her affection for "Charlie" was very strong, and though she would never accompany him on his excursions, she tried to keep him in view as long as possible, and seemed anxious and restless until his return. During feeding-time her subservience to the Chimpanzee was most noticeable, and if not watched she would, without protest, give up the food which he was greedy enough to covet. In this respect "Empress" was a contrast to the Breslau Gorilla who, according to Dr. Grabovsky's account, used to be envious when her companion Chimpanzee was fed. During "Empress's" second year's residence in the monkey-house, "Charlie" was for some time unwell; she then became very anxious, tried to nurse him like a sick child, and pillowed his head on her body.

The Gorilla used to walk in the manner usual to anthropoids with the knuckles resting on the ground, the body inclined forwards and the head thrust out. She climbed leisurely up to the beam that crosses the compartment about five feet above the floor, and often spent much time sitting on this with her back to the wall. Her movements were always slow, compared with the rapid agility of the Chimpanzees, but she was a sure if a deliberate climber. During the first eighteen months of her residence she played constantly with "Charlie," who used to swing on the rope, deal her a sportive blow and then quickly get out of her reach. In these mock combats she rarely seemed to lose her temper, but the habit of drumming with the fists on the breast, as a kind of challenge, was noted early, in relation to the controversy that has raged among naturalists about this particular action in Gorillas. Both

Gorilla "Empress."
Age, 4-5 years.
Zoological Gardens, Dublin.

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Falkenstein and Grabovsky regard this habit as an expression of satisfaction. When "Charlie" was absent, she would also sometimes beat her breast or clap her hands, and she seemed to derive much amusement from rolling an iron dish about on the floor. Fondness for knocking about metal vessels was noticed by observers as a characteristic of one of the Berlin Gorillas.

When in repose, "Empress's" face had a placid and benign aspect, and there was a strikingly wistful expression in her fine dark eyes, of which the sclerotic coats showed a creamy hue. This expression is well caught in Mr. Allen's photograph (Pl. III.) which brings out the increased wrinkling of the skin that became apparent during her last year. When she was pleased or amused, her expression broadened into a grin which was hardly distinguishable from the aspect of her countenance when angry; this is shown in Plate V., a picture taken by Mr. Allen a few seconds before she opened her mouth to emit a cry of rage. Such exhibitions were, however, very rare; her characteristic sound was a deep grunt of satisfaction, contrasting strongly with the shrill outcry of the Chimpanzee or the high-pitched notes of the Hoolock Gibbon in the adjoining cage. "Empress" was an easy animal to manage, affectionate and amiable without any kind of vice. When retiring for the night "Empress" used to make a kind of nest in the straw at the corner of her cage. Here she lay down to sleep often with one arm supporting her head.

From the beginning of her residence, she developed a great fancy for chewing straws, choosing a piece with the deliberation of a person of nice taste. This habit led to an attack of actinomycosis evidenced by a swelling on the back of the neck, but this disease yielded to treatment, with regard to which the Gorilla was very docile. She was willing to take any kind of medicine that might be prescribed by one of her several "physicians in ordinary." Supple remarked that she showed great intelligence in responding to his wishes in these matters, and that her leading motive in drinking a dose seemed to be a desire to please him.

During the last year of her life, "Empress" became

abnormally stout and disinclined for exertion. Her back and arms began to show the characteristic development of muscle (Pl. V.), but she gave up her climbing, and even "Charlie's" teasing failed to make her play. Another Chimpanzee, "George" by name, larger and older than "Charlie," had been introduced into the partnership, and the Gorilla liked to sit in the corner of the cage watching with an amused tolerance the gambols of her two companions.

The Gorilla had a good appetite, ate bread, drank milk, and fed freely on any kind of fruit, with a special liking for ground-nuts; she was fond also of fresh green-stuff such as lettuce or dandelion. Despite the sluggishness already mentioned, she seemed to continue in good health, but the onset of violent abdominal pains early in May showed that some trouble in the digestive organs had set in. After an apparent improvement the pains returned; the Gorilla refused all food, and died early in the morning of May 25th. An examination by Professor A. Francis Dixon certified inflammation of the intestinal caecum as the cause of death. Her weight was then 31 lbs., and her height, when standing in the usual attitude with knees bent and body inclined forward, was slightly over two feet. The weight of the Breslau Gorilla is recorded by Grabovsky as 31.5 lbs. on arrival, when that specimen was somewhat younger than "Empress" was at the time of her death.

During her last few days "Empress" lay on the floor of her house, resting on her back or on one side, with limbs strongly flexed and hands clenched, her plaintive eyes turning from point to point, and still expressing satisfaction at the recognition of "Charlie," her companion Chimpanzee. He evinced much concern at the Gorilla's condition, and when, on the morning of her death, his caresses failed to evoke any response he burst into loud cries of grief. The keeper removed her body from the cage and laid it on the floor of the passage alongside, covered with a piece of sacking. "Charlie," when set at liberty, lifted the corner of this sacking, stood for a few moments gazing at his dead friend, and then replaced the cover with seemly reverence.

Royal College of Science, Dublin.

# SOME MIGRANT NOTES.

BY C. B. MOFFAT, B.A., M.R.I.A.

The notes contributed by Mr. Burkitt (*supra*, p. 103) deserve careful study, and will be welcomed by all who take a genuine interest in the subject of migration.

The phenological department of the Royal Meteorological Society is, I think, clearly justified in adding a migrant table to its returns; for the very regularity on which Mr. Burkitt lays stress, and which his well-kept records go so far to prove, must lend the greater interest to those occasional departures from it which undoubtedly occur, and to the question how far such irregularities may be due to the meteorological conditions prevailing at the time.

There have been a few years in which it would be almost impossible to dispute the existence of some connection between the early or late arrival of the migrants and the forward or backward condition of the season's general advance. The extreme cases in my recollection are the wonderfully warm and forward spring of 1893 and the sadly inclement one of 1917. For the former of these years—during which I was debarred by some exceptionally pressing duties from field observations on any regular scale—I must refer all doubtfully-disposed readers to the notes from various sources published in the *Irish Naturalist* (vol. ii., pp. 150, 177, 201, etc.); I well remember my own surprise, on taking a walk for a short distance outside Dublin on April 23rd, when I heard Whitethroats and Sedge-Warblers singing *numerously* on every side—a state of things that in ordinary years would not exist sooner than, at best, the 8th or 10th of May. In 1917 the influence of the cold season—aggravated, until the middle of April, by strong and unfavourable winds—affected, I must admit, only the "earlier batch" of the migrants; but how badly it spoiled the punctuality records of these, let the cases of the Chiffchaff and Willow-Wren declare.

Of the Chiffchaff's arrival at Ballyhyland in former years I have 28 dates, and of these 17 are within four days, and

25 within eight, of the average, March 29th. Of the three outside dates two are on the "early side" of the zone (March 18th, 1884 and 1894), and so are not due to faulty observation, but probably to the genial weather that prevailed in both those seasons; while the other (April 7th, 1900) is only one day outside the zone on the bad side. This year the Chiffchaff's first appearance here was on April 13th, or fifteen days from the average date. At Killanne Rectory, two miles off, it was heard by Miss Cooper one day sooner, so a small migration wave had probably arrived about that time.

For the Willow-Wren I had until this year 17 records, of which 13 were within four, and all within seven days of April 10th. This year the bird was not seen or heard until April 22nd, twelve days behind its average. The Swallow was also later than I had ever previously known it, arriving (April 24th) simultaneously with the quite punctual Cuckoo. The Corncrake and other migrants of the "late batch" were, as a rule, up to their usual times.

Mr. Burkitt's dates for the Corncrake are surprisingly early—my average from 28 notes of this bird's arrival at Ballyhyland is April 27th, six days later than his—and I can only suggest as a possible answer to his query on the subject that the soil of the country around Lough Erne is favourable to an early growth of such vegetation as suits the Landrail for cover. In many parts of the country this species would be puzzled where to bestow itself, unless in really forward years, at so early a date as April 21st. About Ballyhyland this year, though arriving on the 25th of the month, it was compelled by the backward state of the young grass and corn-crops to take refuge in furze-knocks, and for more than a week afterwards these were the only kind of cover from which its voice could be heard.

There are, I must add, cases of abnormal dates not at all so easy to explain as those that coincide with exceptionally genial or harsh weather, or that may be governed by special local conditions. For example, the astonishing rush of early Swallows into many parts of Ireland in March, 1903 (for particulars of which see R. J. Ussher's note in the *Irish Naturalist*, vol. xii., p. 198) does not appear to

have synchronized with any remarkable deviation from the normal as regards weather or temperature, so that this strange breach of the rule of averages remains so far in want of even an hypothetical explanation.

But of course it should be remembered that the explanation may sometimes be sought in conditions prevailing elsewhere than in our own country, and sometimes, as in the case of the great bird-rush of March 29th, 1911, so well explained by Mr. Barrington in this Journal (vol. xx., pp. 97-110), in a complex combination of circumstances necessitating some knowledge of atmospheric conditions extending over a wide area. This is a further reason why the Royal Meteorological Society should not neglect the subject.

NOTE.

By the average date of first arrival I mean the sum of the dates divided by their number—not the mean between the earliest and latest. The mean, I see, is used by Mr. Foster in his note in the July number (p. 122); but Mr. Foster himself very fairly points out that such a course "may give a misleading impression as to the usual date"—the reason for this being that the mean is sometimes violently affected by one extreme variation. For instance, the late date of the Chiffchaff's arrival at Ballyhyland this year would alter the mean date for that migrant by as much as three days, though it does not affect the average date by more than half a day. In adding up the dates for a bird whose arrival does not always take place in the same month one must, or course, adopt a consecutive numbering, as if the two months were one. Thus, in the case of the Chiffchaff, April 1 may be counted as March 32, April 12 as March 43, and so on.

Ballyhyland, Co. Wexford.

# TOLYPELLA NIDIFICA, Leonh.

BY J. GROVES, V.P.L.S., AND CANON G. R. BULLOCK-WEBSTER, M.A.

We have recently been examining Irish specimens of Tolypella with a view to ascertaining which of those hitherto placed under *T. glomerata* should be referred to the nearly allied species *T. nidifica*. The principal differences between the normal forms of these two species are to be seen in the ripe oospore, which in the case of ordinary *T. glomerata* is of moderate size (c. 325-350 $\mu$ long, 250-290 $\mu$ broad) ovoid or ellipsoid in form, with a yellowish to orange or gold-brown membrane covered with minute granules, developing to a spongy surface when ripe, while the oospore of type *T. nidifica* is much larger (c. 400-475 $\mu$ long, 350-450 $\mu$ broad) subglobose in form with a membrane becoming a rich wine-red when mature and with an almost, if not wholly, glabrous surface. There is little difference in the vegetative parts of the two plants; *T. glomerata* is usually the more slender, but stout forms occur. There is a tendency for the rays to taper more decidedly in *T. nidifica* than in *T. glomerata*. In both species the proembryonic member often persists for a long period.

*T. nidifica* was first found in Ireland by the late Dr. Moore, who collected it many years ago in Lough Neagh. A doubt, however, existed as to its identity, Braun, to whom it was submitted, having apparently seen only immature fruit, but Mr. N. E. Brown reported (English Botany, ed. 3, xii., p. 190) that he found ripe fruit on Moore's specimen in the Kew Herbarium and that it corresponded well with the authentic *T. nidifica* from the Continent. The most satisfactory Irish specimens we have examined are from a lagoon north of Wexford Harbour collected by the Rev. E. S. Marshall in June, 1896.

A somewhat intermediate plant occurs having large subglobose, deeply-coloured oospores but with the surface of the membrane apparently granulated. A fine form of this was collected by Mr. R. Lloyd Praeger in Lough Melvin,

Co. Leitrim, in July, 1899, and a similar specimen by G.R.B-W. in Lough Ballyla, near Kindrum, E. Donegal, last August. Both of these, however, require further examination.

*T. nidifica* may well be expected to occur in other localities in Ireland, especially near the coast, and botanists would much assist in elucidating the doubtful points in connexion with these plants, and in determining their distribution, if they would be on the watch for mature specimens in the late summer. Unfortunately herbarium specimens of Tolypellas do not as a rule include ripe fruits, owing no doubt to the fact that by the time these have matured the plants have become dilapidated and decayed in appearance, and younger specimens are selected for preservation. The oldest and most decayed-looking heads should be collected. We shall be glad to examine specimens, preferably fresh or preserved in formalin (1 % solution). Characeae travel very well if packed rather tightly in a tin in layers between other clean water plants such as Elodea or *Potamogeton crispus, densus* or *heterophyllus*, or between pads of newspaper. They are more likely to suffer in transit by being too wet and sodden than too dry. Specimens may be sent to us at 9 Larkhall Rise, London, S.W. 4.

London.

## NEWS GLEANINGS.

### Prof. Grenville A. J. Cole, F.R.S.

We tender our hearty congratulations to our friend and contributor Prof. Grenville Cole, of the Royal College of Science and Geological Survey of Ireland, whose name appears among the fifteen elected into the Royal Society of London in May of the present year.

# A NOTE ON PECTINARIA KORENI FROM DUBLIN BAY.

BY NATHANIEL COLGAN, M.R.I.A.

All of the species of Pectinaria, using that generic name in its wide sense, appear to be quite rare in East Ireland. In his "Marine Worms (Annelida) of Dublin Bay and the adjoining District"[1] Mr. Southern gives but two records for *P. auricoma* and one for *P. belgica*, all three records referring to specimens dredged in from 5 to 26 fathoms. While shore-collecting on Dublin Bay between Merrion and Booterstown in April last I found two specimens of a third species, *P. Koreni* (Malmgren), one on the 21st, the other on the 28th of the month, both embedded in the sand near low water mark. So far as I can discover, this species has not been previously recorded for East Ireland. In one specimen the tube, so admirable as a sample of Annelid workmanship, was quite buried in the sand; the other tube, of more slender and tapering form, had its lower or tail end projected fully an inch from the surface at the edge of a shallow tidal channel. The tubes, one 65 mm. long tapering from 10.5 mm. to 6.5 mm., the other 60 mm. tapering from 8 mm. to 3 mm., were both quite straight, and this feature, taken together with the characters of the enclosed worms, led me to identify the species as *Pectinaria belgica*. On mentioning the find to Mr. Southern he suggested that the species on closer examination might turn out to be *Lagis Koreni* of Malmgren (referred by later authors to Pectinaria) as he was convinced that many records for *P. belgica* should be transferred to the species which Malmgren in 1865 had taken as the type of his new genus Lagis. On re-examination of the Dublin specimens I found that Mr. Southern's surmise was justified. They agreed in all points with Malmgren's description and figures[2] of *Lagis Koreni* save that the tubes, which he

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[1] *Proc. R.I.A.*, vol. xxviii., p. 215.

[2] Nordiska Hafs-Annulater. *Öfversigt af K. Vet. Akad. Förh.* 1865, and plate xiv. *Öfversigt*, 1867.

gives as slightly curved, were in my specimens quite straight, and the paleolae or golden bristles which crown the head and suggested to Müller the appropriate name *auricoma* for the best known species of what is now the genus Pectinaria, numbered in my specimens 17 and 13, respectively, and not about 14 as given by Malmgren. This character is apparently variable.

Twenty-four hours after the taking of the smaller specimen it was transferred from sea water to fresh water in the belief that it would thus be quickly killed so as to admit of fuller examination. The animal, however, appeared to be little affected by immersion in fresh water. Its gills, once blood-red, turned quite pale, and several of the upper body segments emerged from the tube, but the tentacles continued in active motion. After half an hour's immersion the animal, still in its tube and still quite lively, was returned to sea water. Within ten minutes the gills had resumed their blood-red hue, and within half an hour the worm had completely abandoned its tube.

While examining the setae under a quarter-inch objective I observed a stream of minute, cream-coloured eggs issuing from the body slightly below the gills at a point where no rupture of the tissues was perceptible, and similar eggs could be discerned within the body in several of the transparent parapodia or bristle-bearing feet. This egg-deposition continued for about four hours until fully a thousand eggs lay in the bottom of the watch glass in which the worm, which survived until the following day, was kept under observation. Development of the eggs was well advanced and their form, as one occasionally presented its edge to the observer, was seen to be discoid with a central depression and not globular as they appeared to be when viewed in face. After two days further development disintegration of the eggs set in and my hopes of rearing a brood of young Pectinarias were dashed. No doubt the half-hour's immersion in fresh water had brought about a premature deposition of the eggs. I am not aware of what is the normal method of reproduction in this section of the marine annelids, whether the eggs are laid singly or in cocoons or capsules or in gelatinous masses as occurs

in other sections of this wonderfully complex and beautiful group of marine organisms.

It may be that the high tolerance of fresh water shown by this Dublin Bay Pectinaria depends on the low salinity of the estuarine waters it inhabits, where the outflow of the Liffey mingles with the waters of the Irish Sea. On our western coast Mr. Southern finds this species to be common in Blacksod Bay.[1] It has also been found in Ballinakill Harbour; but the present appears to be the first record for East Ireland. Judging from the descriptions given of the *Pectinaria belgica* found by Cunningham and Ramage on sandy flats at Granton on the Firth of Forth[2] and by Hornel "in immense numbers" on the sands skirting the Lancashire and Cheshire coasts,[3] it would appear that both records should be referred to the present species, *P. Koreni* (Malmgren).

Sandycove, Co. Dublin.

# IRISH SOCIETIES.

## DUBLIN NATURALISTS' FIELD CLUB.

JUNE 30.—EXCURSION TO GLENASMOLE.—The midsummer outing of the Club was favoured by perfect weather and was in every way most successful. Starting in drags from Terenure about 11.30, before one o'clock the party reached the entrance to the Glen and the grounds of the Rathmines water-works, where a reinforcement of cyclists brought the strength of members and visitors up to a total of 21. From the caretaker's lodge, above the lower reservoir, where the drags were dismissed, the party pushed up the glen on foot and crossing to its eastern side by the embankment of the upper reservoir reached the moist hill pastures around the old burial ground of Saint Anne's about half-past two. Here the botanists got to work at once, and the results of an hour's collecting over a small area were enough to prove the great richness of the ground. No less than seven species of orchids were found, some of them in abundance. First came the ubiquitous Spotted Orchis (*O. maculata*), varying in all shades from pure white to bright pink, then the Twayblade (*Listera ovata*), the

[1] Clare Island Survey. Part 47, p. 130. *Proc. R. I.A.*, 1914.

[2] Polychaeta Sedentaria of Firth of Forth. *Trans. R.S. Edinb.*, xxxiii., p. 657.

[3] Polychaeta of L.M.B.C. District. *Trans. Liverpool Biol. Soc.*, vol. v., pp. 259-60.

Butterfly Orchis (*Habenaria chloroleuca*), the Frog Orchis (*H. viridis*), the Fragrant Orchis (*H. conopsea*), the Marsh Helleborine (*Epipactis palustris*) and the Green-winged Orchis (*O. Morio*). With these were the Grass of Parnassus, the Butterwort and the Bog Pimpernel, and, sheeting the hillside with gold, thousands of the Rough Hawkbit (*Leontodon hispidus*). The hedges yielded the Guelder Rose and three species of wild rose, *Rosa canina*, *R. arvensis* and *R. tomentosa*, to which a fourth species, the Burnet Rose (*R. spinosissima*), found on the way up-glen, may be added. To the orchids, too, an addition was made on the way up, the Pyramidal Orchis (*O. pyramidalis*), the day's total of orchid species being thus raised to eight. These hill pastures of Saint Anne's yield the Moonwort and the Adder's Tongue, but the botanists failed to discover either, vegetation being as far advanced as to hide these easily overlooked species.

Time did not permit of the party pushing further up the glen to Castle Kelly, where the limestone drift of the lower reaches gives place to the granite and a new flora, the calcifuge flora, asserts predominance. So the botanists left Saint Anne's with regret and turning downwards reached Mrs. Healy's farmhouse at Bohernabreena by four o'clock. Here while tea was enjoyed *al fresco* in brilliant sunshine, the rich botanical spoils of the day were exhibited and discussed. That irrepressible American alien, *Matricaria discoidea*, was found to have established itself in and around Mrs. Healy's farmyard, while close by another American alien, *Mimulus guttatus*, was observed growing in the moist river shingles having travelled down-stream from its original station above Castle Kelly, where it was introduced more than half a century ago.

The return journey was made in less than an hour, and at 6.30 the party broke up at Terenure, the members taking with them pleasant memories of a beautiful glen made more beautiful by the usually disfiguring hand of man; for the Rathmines water-works with their twin lakes and wooded slopes have most happily combined the useful and the beautiful.

# NOTES.

## ZOOLOGY.

### Recovery of a Woodcock supposed to have been ringed in Ireland.

On the 7th of July, a Woodcock, which is believed to have struck the telegraph wires, was picked up in an injured condition, but still living, at Skellister, Nesting, Shetland. On examination a metal ring was found on its left foot bearing the following inscription: "T. H., Sligo, 4," and was forwarded to me. I shall be glad if any readers of the *Irish Naturalist* can furnish information which will enlighten us, through its pages, on the history of this wanderer.

Wm. Eagle Clarke.

Royal Scottish Museum, Edinburgh.

## Hoopoes in the County Waterford.

About three weeks ago, two birds were observed by the servants in the rectory here. The birds were quite close to the house, hardly twenty yards away, on the avenue, and the description given by them so closely corresponded with a pair of Hoopoes that I went at once, and got "British Birds" by Stonham, and the volumes of "British Birds" illustrated by Frohawk, and turned to the illustrations in both works. On my showing the pictures to the servants, they said at once that the birds they saw were Hoopoes. They appeared to be quite tame, and were only frightened away by the sudden appearance and running near them of two horses in an adjoining field. One of them kept bowing and erecting his crest to the other. I deeply regret that I had not the opporutnity of seeing them myself.

WILLIAM W. FLEMYNG.

Portlaw, Co. Waterford.

## Carrion Crow nesting at Ireland's Eye.

On the 23rd May last, Mr. J. P. Brunker, a close observer of birds, informed me that a black Carrion Crow was nesting at Ireland's Eye and apparently hatching. On the 4th June I visited the Island, and found the Crow sitting on her nest, which was placed in a miniature cavern, in the face of a steep cliff, a little to the south of the Stack-rock. I had a good opportunity of seeing the bird, through a very strong pair of Goerz field-glasses, and feel sure that it was a Carrion Crow. On my approaching the top of the cliff, the bird slipped off her nest, in the furtive way one notices in the case of a raven. As far as I could see, looking down from above, there were no young birds in the nest, nor eggs. I again went to the place, on the 18th June, but the Crow was nowhere to be seen, and the nest was empty. It did not, however, appear to have been disturbed, and there were no signs of anyone having got to it from above or from below—by no means an easy thing to do. It seems strange that the bird should have sat so close as she did, when I saw her on the first occasion, without having eggs, and if there were any, I cannot account for her deserting the nest. Mr. Brunker tells me there were two crows when he was at the island in May last.

The appearance of a Carrion Crow at Ireland's Eye has been recorded by me in the *Irish Naturalist* in 1914 and 1916. The nest was made of roots, twigs and dried grass. The Crow has not been seen since, although the place has been visited by Messrs. Williams and Brunker.

G. C. MAY.

13 Fitzwilliam Square, Dublin.


EQUISETUM LITORALE.

*To face p.* 141. *Eileen Barnes, del.*

# EQUISETUM LITORALE IN IRELAND.

BY R. LLOYD PRAEGER.

(PLATES VI., VII.)

The Rocky River, in the Mourne Mountains, above the point where it joins the infant Bann, is a pleasant trout-stream, babbling among granite boulders or pausing in sandy pools. The banks are rough, rising steeply for a few feet, amid a tangle of willows, gorse, and rocks, with an undergrowth of rushes, Molinia, &c., and then spreading out into heathy land, sheep pasture, or tilled ground. Among the plants which fringe the stream, Horsetails are conspicuous by their abundance and variety. Five species can be readily distinguished—*E. hyemale, E. sylvaticum, E. palustre, E. limosum* and *E. arvense.* The first keeps to the steep overhanging edges of the banks, and is widely spread along the stream. The second, the most pleasing of British Horsetails, is very abundant, and like the last, displays no noteworthy variation. *E. palustre* is rare, but grows in profusion at one place—a compact erect plant, with short branches and large black cones. With it the unbranched form—" var." *nudum*—and other variants also, occur. *E. limosum* is seen only occasionally—the unbranched form here and there in pools in the stream, rather dwarfed in stature ; and the branched form—" var." *fluviatile*—well developed and two feet or more in height—in a couple of riverside ditches. Lastly, *E. arvense* in its typical form keeps to the drier ground—sandy overhanging river-banks and adjoining earthen fences, growing half-a-foot to a foot long, and, as usual, varying considerably as to size, habit, and branching. At the time of our visit, in the middle of last June, the fertile stems had already quite passed away, and the barren ones were fully developed.

Along with these forms, of which five or six might often be seen growing intermixed, another Horsetail occurred, which puzzled me a good deal, and to which, in the course of several pleasant lounging days, I was able to devote some attention. As typically developed, it occupied the steep banks of the stream from about one to three feet above summer level, extending occasionally downward into a foot of water, and more frequently upward into dry ground. Its usual growth was tall (2 feet or more) and quite erect. The stem was slender, unbranched in its lower half or two-thirds, with whorls of simple branches above, diminishing into a long naked tail. A search revealed fruiting stems. These were rare —not more than one to one hundred barren ones—and most of them were not yet mature; they were similar to the barren stems, save that they tended to be less regularly branched, and were stouter above, where they bore each a terminal cone which was disproportionally small. The plant was strongly reminiscent of *E. arvense* on the one hand, and of *E. limosum fluviatile* on the other. At first glance, it suggested the former by its slender stem and its possession of just that peculiar shade of fresh rather glaucous green which belongs to *arvense,* while it agreed with *limosum fluviatile* in the similarity of its fertile and barren stems, its tall erect growth, its stem bare in the lower half, branched and lanceolate in outline in the upper half, and the length of the bare "tail" above. Besides, though usually bearing branches, it tended to lose them when growing in or near the water, and stems could be found which were quite unbranched, as in typical *limosum.* And while its most striking difference from *arvense* lay in the fact of the fertile and barren stems being similar, yet the cones had the shape and pale yellowish colour of those of *arvense,* not the black hue which characterizes *limosum* and *palustre,* nor the ovoid shape of the former of these two. The whole appearance of the plant, including the rarity and poor development of the fruiting organs, suggested a hybrid origin, with *E. arvense* and *E. limosum* as parents, and called for more critical examination.

A quantity of typical material—typical, that is, as

regards the forms of the plants prevailing locally—was collected, from which the following notes were compiled :

*E. arvense*—barren stems (which alone remained) 6-12 inches long, seldom erect, but usually ascending and branched from the base, with the branches longest below, giving a triangular or ovate outline ; when growing strongly among vegetation, the stems attained 18 inches in height, and were then bare in the lower half, the outline of the upper half tending to oblanceolate, with a short abrupt tail. Stem (middle part) about 8 mm. in circumference, strongly furrowed, very firm if compressed laterally, feeling almost solid. Teeth 7 or 8 in number,[1] long-triangular, 2.5—4 mm. long. In cross section the central hollow occupies about $\frac{1}{4}$ of the diameter, the lacunae in the walls (7-8 in number) being small in comparison, and oval with the longer axis radial (not almost as large as the central hollow as in *E. palustre*). Layer of thickened cells just inside the ring of lacunae well-developed, causing the stem if crushed to separate readily into an inner and outer cylinder.

*E. limosum*—as developed locally varies much in length and thickness of stem, and is branched or unbranched ; stems usually 2-3 feet long, quite erect, dark green, bare in lower half or more, branched portion lanceolate in outline, ending in a long naked tail ; cone black and thick. Stem about 12 mm. in circumference, almost smooth, with many faint furrows, weak, collapsing on slight lateral pressure. Teeth about 15, crowded, very narrow, 2—2.5 mm. long. Central hollow occupying about $\frac{3}{4}$ of the diameter ; the lacunae (about 15) in the thin wall very small or absent, oblong with long axis parallel to the circumference. No layer of thickened cells, to cause the stem to divide, if torn, into an inner and outer cylinder.

*E. arvense* × *limosum ?*—Erect, usually about 2 feet high, fresh green in colour, bare in lower half or more, branched above, the branched parts lanceolate in outline with a

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[1] In the Horsetails, the number of teeth (the tips of the rudimentary leaves), of ridges (when the stem is rough), of air-spaces in the cortex (the "vallecular lacunae"), &c., depends upon and equals the number of the fibro-vascular bundles. This number is quite variable in most of the species. In *E. arvense* it ranges from 6 to 19 (being usually from 8 to 12) ; in *limosum* from 10 to 30 (usually 16 to 20).

long naked tail.[1] Cone small, seldom present, rather slender, yellowish, on a pinkish peduncle about $\frac{1}{2}$ inch long. Stem about 8 mm. in circumference, somewhat firm, yielding elastically to lateral pressure, furrowed, but less so than in *arvense.* Teeth about 12, crowded, very narrow, 2.5—3 mm. long. Central hollow $\frac{1}{2}$-$\frac{2}{3}$ the diameter, the lacunae in the wall oval, small, larger and rounder than in *limosum,* as large as or smaller than in *arvense,* their longer axis transverse as in *limosum,* not radial as in *arvense.* Layer of thickened cells absent as in *limosum.*

It will be seen that this more minute comparison amply bore out the first impression of the intermediate character, as between *E. arvense* and *limosum,* of the plant under discussion. Several considerations, particularly the colour of the plant and the characters of the cone, ruled out *E. palustre* as a possible parent. There the matter had to rest until return home rendered books and specimens available. It then became clear that the Hilltown plant agreed well in all essential characters with *E. litorale* Kühle-

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[1] The relation of the branched to the unbranched portions of the stems in the Hilltown plant may be shown as follows, the figures given being the average of a number of stems examined. The joints are counted from the tip down to the uppermost joint which bears roots.

| | Number of Joints. | |
|---|---|---|
| | Fertile stem | Barren stem |
| Unbranched upper part ... ... | 4 | 6 |
| Branched middle part ... ... | 6 | 13 |
| Unbranched lower part ... ... | 11 | 10 |
| Total ... ... | 21 | 29 |

The fertile stems, in spite of the smaller number of joints, attain the same total length as the barren stems, owing to the much greater length of the internodes in the unbranched upper section (see Plate VI., 1, 2). The numbers of which the averages are given above all vary from about $\frac{1}{4}$ more to $\frac{1}{4}$ less.

wein,[1] first described (as a species) from Russia. This plant has been much discussed since its discovery, and possesses a quite extensive literature. To mention the views of two leading authorities on the Equisetaceae, Duval-Jouve awards it specific rank, while Milde comes to no final conclusion, though pointing out the strong evidence for its being a hybrid, *E. arvense* × *limosum.* Recent writers generally accept the latter view of its position, which is much strengthened by the fact that the spores are abortive and the elaters absent—the latter feature I was able to confirm in the Hilltown specimens. For full descriptions, discussions and figures of the plant, with synonymy, &c., the monographs of the two writers quoted above[2] should be consulted. *E. litorale,* which has been characterized by Milde as "one of the most remarkable of cryptogams," is the only known hybrid Equisetum; and for a hybrid it has a very remarkable geographical range, occurring in northern, central and western Europe, Bulgaria, Canada and the United States. In England, it was discovered at Bisley, Surrey, by W. H. Beeby in 1885 (*Journ. Bot.* **24,** 54), and described and figured in the same Journal soon afterwards (**25,** 65, tab. 273). Bisley has since remained the only British station. *Equisetum litorale* is, like several others of our British Horsetails, an extremely variable plant, and it varies in the same directions—size, habit (erect to prostrate), branching (simple to much branched), the bearing of lateral as well as terminal cones, and so on. Milde enumerates four varieties and seven monstrous forms, and to these several other "varieties" have been added by A. A. Eaton, from American material; but as these variations are dependent chiefly on habitat, they have not much importance. The Bisley plant is described as passing gradually from var. *gracile* to var. *vulgare* Milde—that is, from a small unbranched to a larger branched

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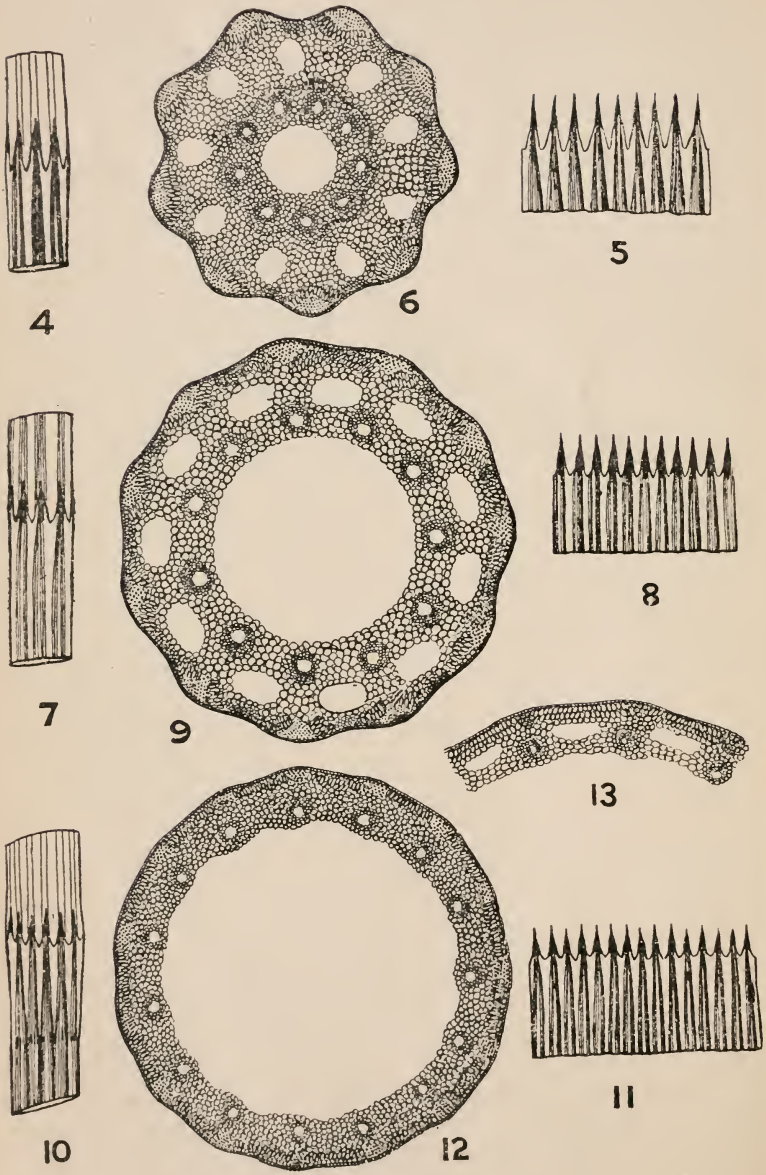
[1] Kühlewein in Ruprecht, Beiträge zur Pflanzenkunde des russischen Reiches, iv. Lieferung, p. 91. 1845.

[2] DUVAL-JOUVE: Histoire naturelle des Equisetum de France. 1864. MILDE: Monographia Equisetorum, in Nova Acta Acad. Nat. Curios. **23,** 2 Abth. 1867.

form; and while the collected specimens figured in the *Journal of Botany,* approach the former condition, garden-grown specimens in my own and other herbaria supplied by Mr. Arthur Bennett, are as much branched as ordinary *arvense.* The Hilltown plant belongs to Milde's var. *elatius,* characterized as follows:—"Caulis erectus 2-4′ altus, apice longe attenuatus, superne et inferne nudus, medio verticillis densis ramorum vestitis; rami superne sensim decrescentes, unde caulis imaginem caudae longae referens. Spica pro caule longo parva." (Milde, *l. c.* p. 365). Milde records this variety from Schlesien and Provence, and characteristic examples of the Hilltown *E. litorale* are identical with specimens from Arles, collected by Duval-Jouve, in the Kew Herbarium. It may be noted that where at one place the Hilltown plant descended into the stony stream-bed it assumed the *gracile* form, becoming smaller, slender, and quite unbranched.

The parentage *E. palustre* × *limosum* has been suggested by some writers for *E. litorale,* and W. H. Beeby, in discussing the English plant (*l. c.*) follows Nyman in adopting this view; but the Irish plant, if a hybrid at all, has certainly *arvense,* not *palustre,* as one of its progenitors. As regards the other parent, the absence of the ring of thickened cells in the cortical tissue clearly indicates *limosum,* as this character is not found in any other species of Horsetail.

In the preceding paragraphs, I have described the steps by which this critical plant was identified, rather than merely publish the record of its occurrence, in the hope that Irish botanists will examine local Horsetails with a view to extending the range of so rare a plant, and that they will be assisted by the comparative notes which I have given. The botanist visiting the Mourne Mountains will find *E. litorale* growing along the Rocky River for about a mile, from the point where it is joined by Shanky's River (ascending the latter stream for a short distance) down to the old mill-dam above the junction of the Rocky River and the Bann. It is likely to occur elsewhere, and if fruiting cannot be mistaken; when not fruiting, the best characters are the number of teeth (intermediate between the number in *arvense* and *limosum*) and the size of the




EQUISETUM LITORALE, &c.

*To face p.* 147.

*Eileen Barnes, del.*

central cavity as seen in cross-section (likewise intermediate). By merely pinching the stem this character can be accurately tested, *arvense* being very resistent and feeling almost solid, *limosum* collapsing at once, *litorale* being elastic and fairly compressible. From all forms of *arvense* the plant can be separated at once by the absence of the cylinder of thickened cells already referred to. One has only to crush the stem of any *arvense* form to render the inner cylinder at once noticeable.

In sections of the stem, as seen under a low power with the microscope, the differences stand out clearly. Miss Barnes has kindly drawn (Plate VII., figs, 6, 9, 12) sections of characteristic stems of *E. arvense, E. limosum,* and *E. litorale* from fresh Hilltown specimens, and these figures may be compared with the corresponding figures in the beautiful plates of Duval-Jouve and Milde. While the proportions between the central cavity, the cortical lacunae, and the diameter of the stem vary in all three, the essentially intermediate character of *E. litorale* is always evident.

## EXPLANATION OF PLATES.

### PLATE VI.

*E. litorale* from Rocky River.

1. Mature fertile stem, × 1.
2. Tip of barren stem, × 1.
3. Piece of dried stem, showing slight expansion of sheaths and contraction of internodes due to drying, × 1.

### PLATE VII.

*E. arvense.*

4. Joint, × 2. 5. Sheath, flattened out, × 2. 6. Section of stem, × 12.

*E. litorale.*

7. Joint, × 2. 8. Sheath, flattened out, × 2. 9. Section of stem, × 12.

*E. limosum* (slender stem).

10. Joint, × 2. 11. Sheath, flattened out, × 2. 12. Section of stem, × 12. 13. Ditto, showing cortical lacunae, after Duval-Jouve.

The figures 4 to 13 are all drawn from the middle part of typical stems.

National Library, Dublin.

# ORNITHOLOGICAL NOTES FROM SOUTH MAYO.

BY ROBERT F. RUTTLEDGE.

The following notes cover the time between August, 1916, and the first week in May, 1917.

**Missel Thrush.**—Less numerous, owing probably to the severe winter.

**Song Thrush.**—Although formerly very numerous I only noticed about half a dozen during last April, although hundreds must have died I never found any remains. During the winter many were seen in a dying condition, and this species suffered much more than the Blackbird.

**Redwing.**—More numerous than usual this winter, and remained later.

**Fieldfare.**—More remains of this bird were found during the spring than of any other species.

They were very numerous here this winter, large flocks were seen up until the last week in April.

**Blackbird.**—Very nearly as plentiful as in former springs; I found the remains of a large number.

**Stonechat.**—One singing on April 6th, with snow still on the ground.

**Golden-crested Wren.**—Of this species, usually so very plentiful at all times of the year, I observed very few this spring.

**Chiff-Chaff.**—Very late in its arrival; it did not appear until April 20th.

**Willow Wren.**—Did not appear until April 23rd this year. I found this bird very plentiful on Derrinrush peninsula, Lough Carra, on April 26th.

**Long-Tailed Titmouse.**—Although apparently exterminated in some districts this Tit was still to be found here quite plentifully after the winter.

**Tree-Creeper.**—Although always pretty abundant throughout the woods, especially in the month of April, I have never noticed so many as in this spring.

**Pied Wagtail.**—No so prominent as usual. As a rule they are present all through April, but only occasionally this season.

**Grey Wagtail.**—The same remark as above applies to this wagtail, though I have noticed many by streams and lakes about the country.

**Swallow.**—For the third successive year the Swallow was first observed on April 22nd, in the evening. I have always noticed the first to be a male.

**Martin.**—Rather later than usual in arriving. The first Martins were noted on May 1st.

**Sand Martin.**—First seen on April 21st.

**Brambling.**—A small flock feeding on a road where stable litter had been put down during the frost. They were seen on December 22nd and 23rd. This is the first I have seen of these birds in the district.

**Lesser Redpoll.**—Fewer about this spring.

**Corn Bunting.**—I had never observed the Corn-Bunting here until April 23rd, 1917, when I saw a flock of about twenty, and on the succeeding days saw them in the same place, namely, in a hedge by the roadside, and I also heard them in the vicinity of Mayo village.

**Hooded Crow.**—Flocks numbering upwards of twenty seen going to roost during the autumn and winter.

**Nightjar.**—These birds were heard during the month of August, 1916, and one was seen on the evening of August 12th. The Nightjar appears to be a regular summer visitor to this district.

**Cuckoo.**—First heard this year on April 25th; several days earlier than usual.

**Sparrow Hawk.**—Seen in about equal numbers with the following species. Both are pretty numerous.

**Kestrel.**—Seen at nest on April 26th ,and another pair nesting on April 30th. I watched a pair for a long time on April 20th, feeding on the "watchman" beetle.

**Cormorant.**—Cormorants were observed almost daily flying in the direction of, or away from, Lough Carra, and were often seen fishing in "bog-lakes." In the evening one could see them collecting on Hag Island, Lough Carra, where they breed.

**Bean Goose.**—Two shot on February 1st, 1917, out of a flock of from seventy to eighty birds. This goose is scarce here in comparison with the White-fronted species, and the above occurrence seems to be the first for some time.

**White-fronted Goose.**—Apparently these geese were driven away from this district by the severe weather. At the beginning of the frost, however, they were exceptionally numerous.

**Mute Swan.**—A great many swans were noticed moving about during the winter, and were to be found on many small lakes throughout the spring.

**Mallard.**—Particularly numerous throughout the winter and many more seemed to remain to breed this spring than usual.

**Shoveler.**—I found a nest containing nine eggs in Coolmeen Bog, Mayo, on April 28th, 1917. There were several Mallard "Spoonbills" or "Spooners," as they are locally called, in the marsh. The bird left the nest very close, so that she was easily identified. The Shoveler is numerous in the swampy ground in the Plains of Mayo in winter, and I am told by the man who preserves the marsh, mentioned above, that the birds have been increasing for the last five years, breeding nearly every spring. A small bog near Lough Carra had a pair of Shovelers on a small pond in it on April 21st, and the birds were seen again on another occasion.

**Pintail.**—A flock consisting of fourteen Pintail were observed on a "flash" of water on April 14th. The majority were males in beautiful

plumage. On April 17th there were two pairs. On April 27th four pair. Each day on which the water was visited showed the Pintails to be present.[1]

**Teal.**—The same remark applies to this duck as those concerning the Mallard. Evidently a large influx took place in November, and during the winter Teal were very plentiful. Every bog which was investigated showed many pairs throughout April.

**Wigeon.**—Wigeon were in very considerable numbers on the lakes this winter, especially during the hard weather when they were in large numbers on Lough Carra. In the evening and morning large flights were heard passing over on their way to and from Carra and feeding haunts.

**Tufted Duck.**—A flock of five were resting on the water near the Pintails on April 14th. Of the five two were males, and three females. Although very numerous on Lough Carra in spring, I had not, until this, seen Tufted Duck elsewhere about the country.

**Corn-Crake.**—The Corn-crake was first heard this year on May 1st. A young bird was captured on May 10th. This date seems very early for young Corn-crakes, as the eggs are usually not laid until the end of May.

**Ringed Plover.**—Although this species was not found nesting at Lough Deen, two pairs of them were seen there, and it is probable that they were about to nest at the beginning of May. They appear to breed regularly at this "bog-lake."

**Golden Plover.**—Although usually very plentiful towards evening about Lough Deen, very few were observed this spring. Throughout the winter, however, flocks were seen moving from place to place. This bird is usually very common in the district.

**Lapwing.**—Very late in nesting this season.

**Woodcock.**—Birds of this species which I weighed during the winter to be in very fine condition. In the evenings during April Woodcock might be seen performing their "love-flights" over the woods and going out to the bogs to feed.

**Snipe.**—The severe winter has had a bad effect upon Snipe. I have found their remains in various places. In places where many Snipe breed other years, hardly one was heard or seen this season. I am told that "there is hardly a Snipe left in the country."

**Common Sandpiper.**—Was first observed on April 25th, when a pair was noticed at Lough Deen. I had never seen them in that locality before.

**Common Redshanks.**—These birds did not appear in numbers until April 14th, though in other years they are abundant on lakes and floods during winter and spring. On April 26th there was a very dark specimen in company with other Redshanks at the northern end of

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[1] Unfortunately I had to leave this country at the end of April and therefore was not able to ascertain whether the Pintails remained to breed.

Lough Carra. Its dark plumage formed a strong contrast with that of its companions.

**Common Curlew.**—Very numerous at all seasons. The flocks began to break about April 20th ; large flocks, however, existed much later. These birds assemble in great numbers for the night at Lough Deen, and are seen making to that lake from the surrounding country every evening.

**Whimbrel.**—The first Whimbrels were heard on April 23rd, which is earlier than their usual date of arrival. They disperse themselves over the bogs for over a fortnight from the time of their first appearance.

**Black-headed Gull.**—Many were killed during the winter, as was testified by the numerous remains. Though my brother and I visited their nesting sites on Lough Carra on April 23rd they had not yet laid any eggs.

**Common Gull.**—This species was not yet laying on April 23rd when we visited Illanatrim Island, their breeding haunt in Lough Carra. This species is abundant in spring, particularly at Lough Deen.

**Lesser Black-backed Gull.**—One observed flying south in the evening of January 4th, and several more during succeeding days.[1] Often seen during April. April 26th—five mature birds. April 25th—at Lough Deen, one mature and two immature birds. We also saw this species singly most days, and on one occasion watched one devouring a dead sheep in the river Robe.

**Great Crested Grebe.**—I did not see any on Lough Carra this spring though they were there most probably. There was an immature bird on Lough Joe (this lake lies N.N.E. of Lough Carra) on April 21st. I was informed by a cottager at the lake that a bird or two always came there in the spring, but that they were never seen during the winter months.

Bloomfield, Hollymount, Co. Mayo.

# IRISH SOCIETIES.

## ROYAL ZOOLOGICAL SOCIETY.

Recent gifts include Rabbits from Messrs. Wright and Brett, and Pigeons from Mr. Dunbar. Five Lion cubs have been born in the Gardens during the last few weeks, a litter of three (two males and a female) from "Red Hugh" and "Nigeria," and a couple of females from "Oseni" and "Sheila." The last-named male ("Oseni") was captured as a wild West African cub, while "Sheila" was born in Dublin from forest-bred West African parents.

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[1] This species seems rare inland in winter (Ussher's "List of Irish Birds," page 49, and Ussher and Warren's "Birds of Ireland," page 339).

## DUBLIN MICROSCOPICAL CLUB.

MAY 9.—The Club met at Leinster House, N. COLGAN (President) in the chair. The officers of 1916-17 were re-elected for 1917-18.

PROF. G. H. CARPENTER showed a preparation of the jaws of a common Wireworm (larval Agriotes) and called attention to the lately published account of the external anatomy of this insect by Mr. G. H. Ford in the *Annals of Applied Biology*, (vol. iii., pp. 97-115, pls. xvi-xvii.) The structure of the jaws as demonstrated was seen to be well illustrated by the figures in this paper.

MR. R. C. TAYLOR showed *Argulus foliaceus* taken from a salmon killed in the Shannon, July, 1916, about 47 miles above Limerick; also two species of Caligidae, one from a salmon taken at the same time and place as the former, the other from one killed, March, 1917, in the Boyne above Beauparc. It appears unusual to find these copepod parasites on salmon so far up the river during the summer months.

JUNE 16.—EXCURSION TO PORTMARNOCK AND MALAHIDE.—A party of twelve members travelled by rail to Portmarnock and walked thence along the "silver strand" by the sea path to Malahide, where they visited the Royal Irish Academy's "Ussher Hut," now in use as a marine biological laboratory. J. N. Halbert and R. Southern demonstrated there a number of rare and interesting littoral animals and entertained the Club to tea.

## BELFAST NATURALISTS' FIELD CLUB.

MARCH 13.—The Vice-President (Joseph Maxwell, J.P.) in the chair. W. B. WRIGHT, F.G.S., delivered a lecture on "The Applications of Geology to the Development of Mineral Resources." He pointed out that if a line were drawn through England from York to Dorset it would be found that in the country to the east of this line the rocks of the Carboniferous period were concealed by a cover of rocks of the Mesozoic or Secondary period, but that to the west of the line the Palaeozoic rocks containing the Coal-measures were mainly on the surface. Hence almost all the English coalfields lay in the western side of the line. As it was now possible to mine to a depth of 4,000 feet it might be that by boring through the Mesozoic cover coal would yet be attainable. Mr. Wright said that systematic investigation might reveal the existence of coal-beds underneath the Tertiary basalts of South Antrim, of which the Dungannon and Coal- island coalfields in County Tyrone were providing the western outcrop.

APRIL 17.—ANNUAL MEETING.—The Vice-President, Joseph Maxwell, in the chair. The Committee's and Librarian's Reports were read by Dr. Charlesworth; the Treasurer's Statement of Accounts by Nevin H. Foster; the Report of the Botanical Section by N. Carrothers; the Report of the Geological Section by Miss E. L. Andrews; the Report of the Zoological Section by C. G. Robertson; the Report of the Archæological Section by Robert May; and the Reports of the Junior Section and

Prizes Sub-Committee by J. A. Sidney Stendall. Dr. Charlesworth submitted his report as Delegate to the Committee of Corresponding Societies of the British Association. These reports were adopted.

Major A. R. Dwerryhouse, D.Sc., F.G.S., M.R.I.A., was re-elected President; A. M'I. Cleland, Vice-President; S. M. Macoun, Treasurer; Sylvanus Wear, Librarian; Miss M. W. Rea and Dr. Charlesworth, Honorary Secretaries. The Sectional Secretaries were elected as follows: Geological, Miss E. L. Andrews; Botanical, S. A. Bennett; Zoological, C. G. Robertson; Archaeological, Robert May; Junior, J. A. Sidney Stendall, and Associate, S. A. Bennett. A ballot was taken for three Members of Committee, and W. B. Burrowes, Joseph Maxwell, J.P., and Joseph Skillen were declared elected.

Suggestions for places to be visited on the Summer excursions were put forward; and it was pointed out that the usual scope of these must for this year be necessarily curtailed as the Railway Companies were unable, under existing circumstances, to give excursion fares. S. C. Porter, B.L., and W. Keiller having been elected ordinary members, the proceedings terminated with the passing of a vote of thanks to N. H. Foster for his services to the Club during the past fourteen years.

May 19.—Excursion to Duncrue.—A party numbering 63 proceeded to Carrickfergus by the 1.20 train from Belfast to visit the Duncrue Salt Mines, for which kind permission had been given by Mr. Miscampbell, J.P. The descent was safely accomplished in buckets, the party, as on a similar occasion, proceeding by twos. After the descent the members, each armed with a candle, proceeded to an examination of the mine. The mines were illuminated by coloured lights, and after a brief account of the geology of the salt beds and their mode of origin by the conductor, Dr. Charlesworth, the party ascended. The boiling sheds were next visited, where the salt is freed of chemical and detrital impurities, and prepared.

June 2.—Excursion to Dundonald.—A party of about forty-five met the conductor (A. M'I. Cleland) at Dundonald Station and walked to an adjacent field, in which were two fine examples of "standing stones." From thence the members proceeded to the Kempe Stone, where a halt was made whilst the conductor gave a short description of this monument of the past and similar structures, illustrating his remarks by a series of photographs. A short walk through the grounds of Rockfield House brought the party to a quarry in the Triassic sandstone, covered by a thick cap of Boulder-clay. After a few remarks from Dr. J. K. Charlesworth as to the points to be observed in the quarry, an adjournment was made to Dundonald Presbyterian Church, where the Rev, J. Bingham very kindly had on exhibition a fine sixteenth-century treasure chest.

June 16.—Excursion to Hillsborough and Lisburn.—Eighty members and friends travelled by the two o'clock train to Hillsborough, and under the conductorship of N. H. Foster walked to the Lagan Canal at Newport and thence to Lisburn. On arrival at Lisburn the party proceeded to the Cathedral, which by kind permission of Rev. Canon Pounden had been kindly opened for their inspection.

The customary business meeting was held in the Cathedral schoolhouse—the Vice-President, A. M'I. Cleland, in the chair. A cordial vote of thanks was awarded to Rev. Canon and Miss Pounden for their attention and hospitality; R. M. Close was elected an ordinary member of the Club.

The interests of the walk by the canal side were chiefly botanical, and it was rather disappointing that in this unusually late season some of the rarer plants which have found a habitat were not yet in flower; and interest chiefly centred in the Sweet Flag, *Acorus Calamus*, of which many flowering specimens were available. This plant was (upwards of 200 years ago) introduced by Sir Arthur Rawdon into his gardens at Moira. His gardens with their ponds have long since disappeared, but from them the Sweet Flag has spread, and now practically lines the canal on both sides from Lough Neagh to Belfast. In Ireland it is only found in a few other outlying stations, where it had doubtless been planted. Among other of our less common plants observed may be mentioned *Nasturtium amphibium*, *Habenaria chlorantha*, *Carex paniculata*, *C. vesicaria* and *Catabrosa aquatica*.

# NOTES.

## ZOOLOGY.

### Psithyrus rupestris in Co. Wexford.

I caught a female of this conspicuous "usurper-bee" at Ballyhyland on August 3rd, and another on August 14th. Though it probably occurs in most parts of Ireland, it appears to have been recorded from only quite a few localities. Mr. Sladen in his fascinating book "The Humble-Bee" credits only three Irish counties—Cork, Limerick, and Sligo—with records of this species. He might, however, have added Down, where it it was taken by the late Mr. H. L. Orr (*Irish Naturalist*, vol. xx., p. 76). With Wexford added, the range is seen to extend into all the four provinces. The insect is probably often overlooked owing to its resemblance to *Bombus lapidarius*; but by coming abroad in August, when queens of the last-named species are not likely to be on the wing, it sometimes runs a risk of easy detection. I should like to know how these two females came to be travelling about at so late a date.

C. B. Moffat.

Ballyhyland, Co. Wexford.

## The Quail in Co. Wexford.

The present summer has been marked by an unusually large visitation of Quails to this part of Co. Wexford—the largest, probably, since 1893, though there was a big influx noticeable for a short period in the early summer of 1899. The birds have remained with us during the whole of July and well into August, many of the cornfields on moonlight nights resounding with the challenge cry that seems to have gained for the Quail its local name of the "wet-weather bird"— a name that has perhaps died out, though I heard it from an old farmer in this neighbourhood in 1904, and "wet weather" is a much better rendering than "wet-my-foot" of the trisyllabic cry, accentuated as it always is on the *second* syllable. Some Quails, I believe, now come to us every summer, but in 1916 I only heard the note once.

C. B. Moffat.

Ballyhyland, Co. Wexford.

## Fulmar Petrels at Inishtearaght.

Last April, when staying on Inishtearaght, I observed a few Fulmar Petrels on a great number of occasions. The birds, though not seen to alight, usually hugged the precipitous cliffs for hours at a stretch on both north and south sides where Kittiwakes and Auks were preparing to breed. I have not as yet had any positive evidence that the birds are breeding on Inishtearaght this season, but may be able to find out before the season is over. Seeing that the Fulmar Petrel has established itself as a breeding species in goodly numbers at the Skelligs, a neighbouring island, it is very likely that an overflow of birds may have proceeded to Inishtearaght for breeding purposes.

C. J. Patten.

University, Sheffield.

## Sandwich Terns breeding on Mutton Island, Galway.

I am much indebted to Mr. John Glanville for letting me know that the Sandwich Tern is breeding this year in small numbers on Mutton Island, Galway. This is a newly-discovered breeding haunt of this fine tern, and the species, nowhere numerous around our coast, (as far as our present knowledge goes), deserves rigid protection. Mr. Glanville tells me he is most anxious that the birds should not be molested, and that he will do all he can to watch and drive off egg-raiders.

C. J. Patten.

The University, Sheffield,

## Arctic Skuas on Migration on Mutton Island, Galway, and at Moville, Co. Donegal.

On June 8th last Mr. Glanville collected on Mutton Island an Arctic Skua which he was kind enough to send me for investigation. Though the specimen, an adult male, was in most excellent plumage, and a beautiful skin was made, nevertheless the bird was much emaciated. Curiously enough, on June 13th, Mr. L. Power, light-keeper at Inishowen, found another Arctic Skua in Moville. The bird had flown against a tree and had injured itself. Mr. Power very kindly sent me the specimen which proved to be an adult female, also in beautiful plumage, but the body was very emaciated. As these two birds were picked up more or less by chance there is no reason to doubt that many others, passing northwards along the Irish seaboard, were in a similar state and may have died unnoticed. Except when actually at their breeding-grounds, Skuas are strongly pelagic, and it is customary for them to perform their migratory passages some miles off the coast. Some disturbance at sea seems to have been the means of depriving them of their food (small fishes obtained second-hand from the crops of gulls). Though the Arctic Skua is the one most commonly met with round our coast it is nevertheless scarce as a passing visitor in June as compared with the large numbers which appear in autumn, especially in September and October.

C. J. Patten.

The University, Sheffield.

## Wood-Warbler on Migration obtained at Maidens Lighthouse, Co. Antrim.

I am greatly indebted to Mr. John Barlow, light-keeper, for kindly sending me a beautiful adult male Wood-warbler which he obtained at 10.30 p.m. on May 10th last at Maidens lighthouse. The bird struck the lantern on a calm dark foggy night with rain and light east wind. Numerous Sedge-Warblers, Willow-Warblers, Greater Whitethroats, and a Redstart, appeared the same night, specimens of which were also forwarded. The above Wood-warbler is only the second which I know of which has been obtained from a light-station, *and the first which has actually struck a lantern.* The previous specimen was *shot* on Blackrock, Co. Mayo, on May 27th, 1890, as recorded by the late Mr. Barrington. ("Migration of Birds at Irish Light-stations, Analysis of Reports," 1881-97, p. 76).

C. J. Patten.

University, Sheffield.

# LOSSES TO A LOCAL FLORA.

BY C. B. MOFFAT.

THE glacial conditions of the winter of 1916-17 have left their mark on the flora as well as on the fauna of this neighbourhood. At least five species of plants have been so reduced that it seems doubtful whether they will ever recover their former plenty. These are the Weld (*Reseda luteola*), Pale-flowered Flax (*Linum angustifolium*), Fleabane (*Pulicaria dysenterica*), Greater Broomrape (*Orobanche major*), and Lesser Broomrape (*Orobanche minor*).

The Greater Broomrape has been brought to the very verge of extermination in its old stronghold of Killoughram Forest, where, until a few years ago, its flowering spikes could have been counted by thousands every summer as they towered over the tops of the Broom, which was here undoubtedly their chief host. Since the ploughing up of a favoured stretch of broom-covered scrub this profusion has been a thing of the past ; but I could still have counted some hundreds of the spikes during a walk through the wood in 1916. This year, though searching carefully, I failed to find more than one.

As the Broom had suffered considerably from the hard weather, while the Gorse was nearly destroyed, it is possible that this general disappearance of the Broomrape is due to impaired vitality on the part of its host-plants. Even the Heather (*Calluna vulgaris*), which sometimes serves as a host, is alleged (as Mr. J. P. Burkitt informs me) to have been killed in some districts, and may (though I did not notice the fact) have endured minor damage here.

The Lesser Broomrape should this year be celebrating the Jubilee of its first recognition as a County Wexford plant ; for it was in 1867 that Miss E. M. Farmar found at Bloomfield (as related in the " First Supplement " to *Cybele Hibernica* [1]) the two plants, on Sweet Pea and Clover, which form the earliest recorded instances of its

[1] More : " Recent Additions " (1872), p. 24.

occurrence in this county. Its increase since that date must have been extremely rapid, and for fully forty years prior to 1916 it was so abundant throughout this district as to affect the coloration of every clover-field. It was also common as a roadside plant, and in that capacity it flourished chiefly as a parasite on White Clover (*Trifolium repens*), though in meadow-ground it may have been—as the editors of *Cybele Hibernica* (1898) consider it to be throughout Ireland—restricted to *Trifolium pratense*.

As a roadside plant, however, *Orobanche minor* has now vanished, and *Trifolium repens* has, therefore, possibly ceased to be its host. And though in clover-fields it is still far from extinct, the reduction it has undergone within the past two years is certainly over 95 per cent. This is not exclusively due to the severity of last winter, for I had been struck by a marked decrease of this species in the summer of 1916; but in 1917 the diminution has been still more manifest, and it seems probable that the exceptional weather has caused the further decline.

The three other reduced species showed no symptoms of any diminution until the summer of 1917. Not one of them is now to be found in one-tenth of the quantity that existed a year ago.

Of these three species, two—the Weld and the Yellow Fleabane—are known limestone-lovers. *Reseda luteola* is referred by Mr. Colgan to his Calcicole B, and *Pulicaria dysenterica* to his Calcicole C group. I do not know whether *Linum angustifolium* is credited with any similar leanings or not, but from the company it keeps I should not be surprised to hear that it was so. We have no limestone in this district, where the formation is of Silurian age; and it is possible that the few calcicoles we possess in our decidedly calcifuge flora are for that reason peculiarly sensitive to uncongenial weather, or any other change for the worse in their surroundings.

At any rate, it is a remarkable fact that even before the destructive winter of 1916-17 we had lost or nearly lost from this neighbourhood several of our more interesting calcicoles—all within the past ten or twelve years—from causes that I am quite unable to decipher. The most

singular disappearance of all has been that of the Yellow-wort (*Chlora perfoliata*) ; for this species, though confined to dry, upland pastures, used to abound in such localities, as far back as my memory extends. When it began to decline I cannot say, as I was little in this part of the country between the years 1902 and 1915 ; but in that interval the Yellow-wort vanished. The same is true of the Felwort (*Gentiana Amarella*), a frequent companion of the Yellow-wort, though a good deal less common. A third species of the B group—the Marjoram (*Origanum vulgare*) died out during the same period in the only spot within a three-mile radius of Ballyhyland where I had known it to exist, though the ground where it grew—and had grown for at least 35 years prior to 1902—had certainly not been subjected to any disturbance. A fourth loss prior to 1915 was that of the only Calcicole A plant that could ever have been claimed for our local flora (discarding mere casuals like *Galeopsis angustifolia*) : namely, *Orchis pyramidalis*, whose presence in a little grove of spruce-firs at Caim had always seemed a bit of a mystery—though the fact that the only known locality for the Marjoram was little more than 200 yards distant may suggest that the soil was here a trifle more favourable to calcicoles than that of the district generally. The dying out of both species would, however, similarly suggest that by this time the favourable properties in the soil must have been exhausted.

In addition to the four plants mentioned I am afraid that a fifth calcicole has disappeared in the Mountain Cudweed (*Antennaria dioica*) which I failed to find, this year and last year, in an old habitat not half-way up Blackstairs ; but as I had not marked the spot in former years with proper exactness the fault in the case of this species may be mine. The Danewort (*Sambucus Ebulus*) also shows a tendency to die out ; but as its principal stations were sites of former cottages it is scarcely a case in point.

The calcicole species that remain in our flora are now so few that they are worth enumerating. Only six are common :—*Pimpinella Saxifraga, Tussilago Farfara, Thrincia hirta, Carex glauca, Trisetum flavescens*, and *Ceterach*

*officinarum.* Three others, though local and scarce, retain their hold in undiminished strength in the few stations to which they are restricted. These are *Hypericum perforatum* (found chiefly near lime-kilns), *Leontodon hispidus*, and *Spiranthes autumnalis.*

The above are, I think, the only plants we have left (exclusive of cornfield or waste-ground casuals) that are certified as limestone-lovers in *Cybele Hibernica*, and that have not suffered from last winter's severity. I must, however, mention one further species, whose calcicole proclivities (duly recognised in *Irish Topographical Botany*) have not interfered with its survival in the very few settlements it has effected in this neighbourhood. I refer to *Rubus discolor*, the Bramble so universally prevalent about Dublin, and often supposed to be common everywhere, but in the district round Ballyhyland so exclusively confined to a few " suspicious " localities that no one could possibly claim it as a truly native plant. Except in the outskirts of the town of Enniscorthy, I know only four spots where it grows, each being close to a cottage, on ground where it is probable that lime may at some time have been thrown. Near one of these settlements the calcicoles *Poterium Sanguisorba* and *Convolvulus arvensis* (otherwise nearly unknown here) once flourished as prosperous colonists ; but both soon died out. The sturdier *Rubus discolor* contrives in each spot just to hold its own, neither decreasing nor spreading, over a space of some four or five yards in length. It is evident that the late winter did this plant no harm.

I hope these notes may serve to direct attention to the question whether any similar process to that under notice here has been observed elsewhere in Ireland, and whether, if so, there has been any marked difference in its effects in different parts of the country, especially in connection with the difference between limestone-loving and limestone-avoiding plants. In the near future, the spread of tillage must add to the difficulty of determining from what causes various members of our flora have tended to disappear

Ballyhyland, Enniscorthy.

# NOTE ON THE LONG-EARED OWL.

BY J. P. BURKITT.

My friend, C. V. Stoney, once used to me the expression that the Long-Eared Owl was an uncertain nester, and observations of mine corroborate that to an only too aggravating degree. I had planned this year to make continued observations of these birds throughout the mating season, and formulate relations between their evening practices and their nesting, including the incubation of the male, and to follow up their habits with their young. This note is one of failure. But failure is sometimes instructive. Others may have very much easier chances of observation than I had.

I began on the 17th February to watch a pair in a small planting, who had raised a brood the previous year, having had goodsized young on the 8th April. The old nest was gone to pieces (a young skeleton on the ground below), so a new nest had to be watched for. Each evening watch means about 1 to 1½ hours. After eleven watches I found on March 29th one egg in what I had diagnosed since the 20th to be the selected nest. Thereafter up to April 4th the birds were about the nest at dusk, but on the 12th I found still only the one egg, and bedded round in snow. And on subsequent evening watches there was no further sign of the parents I took the egg on the 24th April, and found it cracked.

I do not think the birds were disturbed by my one climb to the nest (in daytime) and they kept about it for at least a week later. So I do not know what bad luck happened. We had snow and frost from the 8th to 12th April, with a very severe frost on the night of the 10th.

I then, from April 12th, located and took on another pair in a larger plantation some miles away. This pair as events proved had not yet nested. I had to pay about a dozen evening visits before the misleading female gave clear indication of the nest she was going to occupy, and that was on the 11th May. From then till the 17th she

went to a nest each evening cautiously shortly after leaving her roost, and when on the nest varied her ordinary note with new chuckling or cuddling sounds. I had previously climbed to this nest, so there was no question of young. What was my chagrin to find that on my next two visits, 22nd and 23rd May, she never went on to the nest, while the regular evening duets of the pair dwindled away, and from the 26th there was no further sign or sound of the birds! Now, the strange point is that I had a similar experience with a pair of birds in 1915. I had watched them from the 28th March. A nest was apparently selected, as in the second case, by the 5th April, and retained till the 24th, but no eggs ever appeared, and the (mating) notes died off. This latter nest was in a wood about a quarter of a mile from number 2. Query: was this a peculiarity of the same pair of birds, or a peculiarity of the species?

I would suppose this bird to be too well studied, for the above pre-brood observations to add anything fresh, but there was with both the pairs which I watched this year a regularly maintained habit of clapping the wings together in flight, like that of the Nightjar. Unless aware of the cause, one would never connect the noise with a bird, much less an owl. It is evidently a regular part of the connubial language, and practised by both parents during their early flights about the wood and *before* leaving for their nightly work. I have never seen this mentioned, except a clapping referred to by Mr. Kearton as a means of terrifying the human intruder when handling the young. This wing-clapping was practised the whole time I watched the two pairs this year, from the first time that I discerned it, early in March.

The mating birds roost 15 to 50 yards apart. The female is ever changing, but the male's roost seems to be almost constantly in the neighbourhood of the ultimate nest, and not much varied; in fact the general impression he gives throughout is of anxiety to keep her from neglecting her nesting duties. If you climb to the nest in the daytime, before the female is sitting, a few notes from him may show he is doing sentry. These birds open their night by a few low *hoo-s* at dusk from the male on his roost.

They will probably be so soft as to be barely audible close at hand on a quiet night. This low bass note gets stronger as the dusk increases, but though comparatively far-reaching it is nearly impossible to locate exactly, especially when near at hand or overhead. His note is always in a regular beat of about 3 seconds, whereas the female's wail (rather like a distant lamb) is, at her best, about 10 seconds interval, and may be much more. After the male's first call there will be silence for perhaps 5 or 10 minutes, when he calls again; probably silence again, or just one reply note from the female. She may have 10 minutes between her first notes, but she gradually lessens the interval to 10 or 12 seconds. Twenty minutes to half an hour from his first call, she flops down from her roost in the thick top of a spruce to a bare branch half way to ground and half way to the edge of the wood, keeping up her call. She seems generally the first to leave her roost. He then comes along clapping his wings together in slow but pretty loud flaps, and both will fly and flap wings between various perches along the adjacent edge of wood, calling to each other, and flying about 10 feet from the ground. Or as grey shadows they will flit about the wood, noiseless, except for the uncanny clapping. When they think the light sufficiently gone, the male drops down from his perch to 3 or 4 feet over the field, and steals away along the outside edge of the wood for his night's work. She follows later. If near nesting time she may not follow, or she may follow, but return in three quarters of an hour and keep up her wailing call half through the night, from perches near the edge of the wood. I have thus been able to hear her when I was nearly a quarter of a mile away. I never heard the male call after he first leaves the wood. The whole evening duet till they leave the wood lasts from 30 to 50 minutes. I was treated once to the probably rare experience of the male *hoo-ing* on the ground within 5 feet of me, for a minute or so. It was amusing to see his head rising and his eyes glaring as he gradually scented something wrong.

Enniskillen.

# NOTODONTA BICOLORIA IN. CO. KERRY.

BY L. H. BONAPARTE-WYSE.

On the morning of June 7th last, whilst cycling on the Kenmare road, between Muckross and Derrycunihy, I noticed a white moth flying round a holly tree. Not being sure of its identity, I dismounted from the bicycle and waited till it had settled on the underside of a holly leaf. I then saw with pleasure that it was a male specimen in good condition of the White Prominent, *Notodonta* (*Leucodonta*) *bicoloria* (Schiff.), one of our rarest moths and a great prize. I soon had it in a pill-box and was glad to get it home undamaged.

The following interesting account of the moth's occurrence in our islands and abroad taken from Barrett ("Lepidoptera of the British Islands," vol. iii., pp. 129-130) is worth quoting :—

"A very rare species in this country, and little is known of its habits. The first specimen known to have occurred in these islands was taken in the middle of June, 1859, at Killarney, in the south-west of Ireland, by Mr. P. Bouchard, a professional collector. It was understood to have been beaten out of a birch, but he was naturally reticent as to its habits. Several more were taken by him in the same place—Mr. S. Stevens believes seven or eight—and the wings of one were found at the foot of a tree. Doubt was subsequently raised as to the genuineness of the captures, but Mr. S. J. Capper tells me that when he visited Killarney the residents showed him the very tree on which one of what they called "Micolora" was taken ; and I think that there is no reason to suspect fraud in this case. In June, 1861, Mr. John Smith, an artisan from Manchester, had the good fortune to secure a specimen in an extensive wood, known as the Burnt Wood, in North Staffordshire. This was exhibited at Manchester, and led to an expedition by Mr. Joseph Chappell, a well-known Manchester collector, to the same place in June, 1865, when he and a friend had the good fortune to obtain six examples, by beating birch trees and bushes. One of these laid a number of eggs, the larvae from which were carefully tended, but they proved extremely delicate and most of them died, seven only producing the perfect insects. . . In 1866 another specimen seems to have been secured at Killarney. . . . Mr. W. F. de Vismes Kane states that two specimens have been obtained in the County of Kerry by Miss Vernon, and he exhibited one of these in London in 1892. Major J. N. Still possesses a single specimen, the capture of which

near Exeter, Devon, in 1880, appears to have been satisfactorily proved; and this I think completes the record of captures in the United Kingdom.

Not a very common species abroad, but found in France, Belgium, Germany, Sweden, Livonia, Finland and Russia . . ."

Since this was written (1896) Mr. Thomas Greer mentions (*Ir. Nat.*, vol. xxv., p. 82) a specimen of *N. bicoloria* that a friend met with in a "new locality in the South of Ireland." This specimen and mine are probably the only captures of the moth in the Emerald Isle within the last twenty years.

Holland Park Gardens, London, W.

# REVIEW.

## ORNITHOLOGICAL BIBLIOGRAPHY.

**A Bibliography of British Ornithology from the earliest times to the end of 1912,** including biographical accounts of the principal writers and bibliographies of their published works. By W. H. MULLENS, M.A., LL.M., F.L.S., M.B.O.U., and H. KIRKE SWANN. 8vo. pp. 20+708 pp. London: Macmillan & Co., 1916-17. Published in 6 parts, price 6s. net each.

This well-printed work will be of great value to the many persons who are interested in ornithology, particularly those whose taste leans towards the historical and biographical side of the subject. On our first examination of the book, we failed to discover on what principle ornithologists had been selected for inclusion, as the names of some well-known writers on birds were not to be found, and others were included whose contributions to ornithology were of the slenderest. Eventually we found a small inset in red ink pasted into the second part, which stated that "it has been considered necessary to limit the present portion of the Bibliography to those authors who have written a separate work, or a section of a separate work." But the titles given under writers thus qualified is not limited to such separate work or works, but includes a selection—made, presumably, with an eye to their relative importance—of their contributions to periodical literature, down to items occupying less than a single page. It is necessary to bear these limitations as to both the list of persons and the lists of their papers thoroughly in mind when consulting the book, otherwise quite erroneous impressions might result. Within the limits thus laid down, the information given is full of interest, and appears especially rich where the older ornithologists are concerned. The biographical notices are often somewhat diffuse, and being printed in large type have added materially to the bulk of the book, and are a contributing cause of its high price. It is a pity that the editors were unable to see so many of the books which they catalogue, as

such entries at second-hand are not satisfactory. Access to a good ornithological library ought to have prevented looseness as regards certain items. For instance, who would recognize under the entry "The Birds of the Co. of Cork. Cork: 1894. 8vo" Mr. Ussher's contribution to the edition of Charles Smith's "Ancient and Present State of the County and City of Cork," issued by the Cork Historical and Archaeological Society, of which it constitutes chapter 6 of vol. ii., being entitled "A Catalogue of the Birds observed in this county." One also notices with regret an absence of accuracy of detail in some of the entries—for instance, "Major G. E. H. Barrett-Hamilton, B.A., of Kilmarnock House"; "Dr. More"; "R. M. Barrington, LL.D." Biography and bibliography are now-a-days such exact studies that inaccuracies of this kind are to be regretted in so useful a work, even though they do little to detract from its value.

We are glad to learn (from the red slip already mentioned) that the authors intend that the present volume should be followed by a Geographical Bibliography or "County Index," in which will be included not only short titles of the books, but all articles and notes in periodicals, provided they are of a faunistic nature. By being complete, a bibliography gains very greatly in value.

R. Ll. P.

# IRISH SOCIETIES.

## BELFAST NATURALISTS' FIELD CLUB.

June 30.—Excursion to Pot of Pulgarve.—Under the conductorship of A. M'I. Cleland, a party of about fifty members journeyed to Newcastle for the Pot of Pulgarve, a lovely little hollow at the head of the Glen River, at the foot of the slopes of Slieve Donard and Slieve Commedagh. On reaching Newcastle the party quickly traversed the town and then began the long, slow climb to the Pot, reaching the latter shortly after two. From here some of the more active members ascended to the summit of Slieve Donard, the majority, however, contenting themselves with a short clamber up the gulley in which the Glen River takes its rise, and where some very fine examples of granite weathering were met with. Tea was served in the Slieve Donard Hotel, after which the majority of the party returned to Belfast by the 6.50 train.

July 14.—Excursion to Ballywalter Park.—By permission of Lady Dunleath, who met the party on their arrival, the grounds and aviary were thrown open to the visitors—a kindness which was much appreciated. A business meeting of the Club was held after tea at the Dunleath Arms, at which three new members were elected.

JULY 28.—EXCURSION TO DOWNPATRICK.—Thirty members and friends travelled by the 10.50 a.m. train to Downpatrick. W. B. Burrowes and R. May were the conductors. A pleasant walk of two miles brought the party to St. Patrick's Holy Wells at Struell, once a famous resort of pilgrims. A clear stream which flows down a little valley supplies the water. Wells have been dug along its course and covered in with stone-built huts. Utter neglect is now a prominent feature of the historic spot. A walk of one mile further brought the party to Sleive-na-Griddle, 414 feet in height. On the summit a cromleac formerly existed; all that now remains is the top stone. On the return to Downpatrick an excellent tea was served in the Down Hunt Hotel, after which a short business meeting was held. F. A. Heron presided, when two new members were elected.

AUGUST 11.—EXCURSION TO MAGHERAMORNE.—A party of sixty members travelled thither, under the conductorship of A. M'I. Cleland. On reaching Magheramorne station the members were met by the manager (Mr. F. W. Davis) of the British Portland Cement manufacturers, and by him and his assistants conducted through these very important local works. From the works the party adjourned to the quarries, when the conductor gave a brief address on the principal geological features of the rock sections here seen. As the quarry has been in continuous work for the past hundred years, and as its lowest workings are now below sea-level, it affords an excellent practical demonstration of the geology of the district. The party next passed down to the shore to inspect an artifical and modern raised beach, caused by the tipping of quarry-rubbish upon the soft surface of the estuarine clays which have thus been pushed well above high-water mark, disclosing countless remains of oysters and other molluscs. The members afterwards visited Magheramorne Glen, kindly thrown open to them by the Hon. Miss M'Garel-Hogg and Lady Evelyn Baring. This proved to be an enjoyable part of the day's proceedings, the botanists meeting with a full reward, the principal find being a beautiful growth of Viper's Bugloss (*Echium vulgare*).

AUGUST 25.—EXCURSION TO BALLINDERRY.—Travelling in brakes, the party halted at "Jeremy Taylor's Church," After inspecting the church the members drove to Lower Ballinderry corner, whence a walk of about half a mile led to the ruins of the old church of Portmore. Here the members scattered to follow their various pursuits till four o'clock, when tea was served in the schoolroom. Afterwards a business meeting was held, at which A. M'I. Cleland announced that the average attendance at the excursions during the season had been about fifty. On the return journey the Tansey Road was taken through Killultagh and past Stoneyford to Castle Robin, where a fifteen minutes' halt was allowed. From here the party admired the Lagan Valley spread beneath them, whilst inspecting the somewhat meagre ruins of the castle. The drive to Belfast was then resumed.

## DUBLIN NATURALISTS' FIELD CLUB.

JULY 21.—EXCURSION TO THE NORTH BULL.—A party of 12 assembled at the Bull bridge, Dollymount, about 2 p.m., and proceeding along the Bull Wall struck northward past the army huts until the hollows amongst the sand-hills beyond the range of targets were reached. Here a halt for luncheon was made in rich botanical ground carpeted with the Sea Milk-wort (Glaux), the Knotted Spurrey and the Sand Pansy (*Viola Curtisii*), more conspicuous features being the Yellow-wort and the Centaury with occasional belated spikes of the Pyramidal Orchis.

Mr. Arnold Graves having been duly elected a member at a business meeting held after lunch, the majority of the party pushed northward to the extreme end of the sand-bank leaving a contingent behind to more fully explore the sandy hollows. Though a drifting sea fog veiled the Bay and shut out the fine prospect of the Dublin Hills for which the Bull is famous, the dunes were flooded in sunshine and troops of the Six-spotted Burnet hovered over the tall Ragweeds, the silky, yellow cocoons of the moth being observed in large numbers on the slender stems of the Sea Bent (Psamma). Farther on two fine individuals of the Silver-washed Fritillary were seen and careful search amongst the dense growth of Bent was rewarded by the discovery of abundance of the Kamtschatkan Wormwood, *Artemisia Stelleriana*, an accidentally introduced alien first detected here by Miss A. G. Kinahan in 1891, and still maintaining its place amongst natural surroundings. Several plants of Asparagus, too, were noted looking thoroughly wild amongst the native growths and near the extreme end of the sandbank a large solitary tuft of the Trailing Willow (*Salix repens*) was seen, the only plant of this willow established on the dunes here and probably originating in seed wind-borne from the banks of Portmarnock about a mile to the northward.

Nearing the extreme Sutton end of the Bull a remarkable mirage effect was witnessed. Through the heat haze and the drifting sea mist an archipelago of rocky islets appeared rising from the sea in the distance, but as the party approached this visionary archipelago it resolved itself into a few sand hummocks less than a foot high, capped with sea-weed, and lying near the edge of ebb tide. On the way back vast sheets of the Sea Lavenders (*Statice rariflora* and *S. occidentalis*) just beginning to flower were noted on the inner tidal flats and scattered plants of the Hare's-foot Trefoil were found amongst the Bent.

Although no special attention was paid to marine zoology, numerous shells of the sand-dwelling mollusca were observed belonging chiefly to the genera Solen, Tellina, Mactra, Venus, Tapes, Pecten, and Cardium, *Solen vagina* occurring rather frequently amongst the innumerable valves of its much commoner congener, *S. siliqua*. The party returned to Dublin by tram about 7 o'clock.

# NOTES.

## BOTANY.

### Magilligan Plants.

Last July I was glad to find the Yew still existing in Co. Derry. It was found by David Moore in 1835 on the cliffs of Benevenagh, 1000-1300 feet, but had apparently not since been seen in the county. Its existing habitat is on high basaltic cliffs in the townland of Woodtown, Magilligan, (The area which forms the eastern corner of the great triangle of Magilligan, comprising the townlands of Woodtown, Umbra and Benone, has usually been referred to by botanists as Benone or Umbra, but Benone is properly confined to the flat sandy area north of the railway, while Umbra is the eastern, and Benone the western part of the rising ground which adjoins, extending as far as the top of the cliffs.) Several old Yew-trees grow flat against the face of the rock above the place marked "The Merrick Stone" on the 6-inch Ordnance map, and a smaller bush and a large dead stump were seen near by. The spot may be fixed on the one-inch map as ¾ mile W.S.W. of the summit of Eagle Hill. The elevation is 500-600 feet. Save with a rope from the top, the Yew is inaccessible; but I was able to climb sufficiently near for positive identification.

Near the base of the same cliff, a little to the right and to the left, and accessible to a climber, are a few bushes of another rare local plant, *Pyrus rupicola*; this is, no doubt, Templeton's old station (under *P. Aria*) "sparingly on Umbra rocks," where it had not been seen again till re-found by Mr. Tomlinson last year, and seen again by him during the same week as my visit. Mr. Tomlinson writes:—"In addition to the isolated but fine specimens on face of the Woodtown cliffs, there are half-a-dozen trees growing in the ravine where Meconopsis occurs (see below). They are all on the Woodtown side of the glen, and arch over from the steep side of the ravine. It is strange that wind effects are so noticeable on the plant here, and much less so on the plants of the same species on the cliffs to the west."

Another local station which will be the better for exact definition is that for *Meconopsis cambrica*, half a mile north-east of the last. A number of fine plants of it grow on crumbling basaltic rocks on the Woodtown side of the stream which separates the townlands of Woodtown and Umbra, and which may be more conveniently found on the one-inch map as the first streamlet west of Eagle Hill. This is, no doubt, S. A. Brenan's station, "Magilligan Braes"—a very vague term—where it was refound last year by Mr. James Henry ("in a little glen at Benone"), and by Mr. Tomlinson a couple of days before I visited the place. The spot is at about 500 feet elevation, a picturesque gully with a waterfall on its eastern bank, and a wooded glen below. Mr. Tomlinson saw some fine plants also in the bed of the ravine at the foot of the waterfall,

I have thought it well to define exactly the stations of these three plants (owing to their cliffy habitat, they are in no danger of extermination as a consequence !) because from the time of Templeton there has been a looseness in the use of the local place-names, and as a result considerable uncertainty as to the location of the stations.

Mr. Lilly kindly took me to see his Magilligan station for *Lastrea Thelypteris*. It lies south of Magilligan camp—a long narrow marshy meadow adjoining (on the east side) the main road to Bellarena just two miles from Magilligan Point. There is plenty of the Marsh Fern here, growing dwarf among a vegetation consisting largely of *Potentilla palustris* and *Galium palustre*, along with Menyanthes, Caltha, Spiraea, Iris, Mentha, &c. The plant appears to be now almost extinct in Ulster through drainage, and this Derry station is very welcome.

R. Lloyd Praeger.

Dublin.

## Muscineae of Achill Island.

In August, 1911, a party consisting of Messrs. J. C. Wilson, J. B. Duncan, D. A. Jones, and the late S. J. Owen visited Achill Island in search of Cryptogams, and Mr. Jones gives an interesting account of what was done, with a full list of the species collected, in the *Journal of Botany* for September. They were successful in the principal object of the expedition in finding again *Adelanthus dugortiensis*, a small quantity of which mixed with mosses Canon Lett gathered in 1903 during a fog on Slievemore. They found it in single stems in hummocks of other mosses and also in pure tufts on rocky ledges. It is endemic, and is allied to *A. unciformis* of South America. The fruit is not known. It is satisfactory to know something about the habitat of this curious species, the most interesting liverwort which has been found in the British Isles of late years. *Scapania nimbosa*, hitherto only known in Ireland from Brandon, was also met with on Slievemore, but sparingly as single stems growing with mosses. Mr. Jones found it also in Carnarvonshire on Glyder Fawr. The north-west slope of Slievemore is a paradise of Hepaticae ; mosses are not so abundant there as this paper shows, but there are fine tussocks of the rare *Dicranum uncinatum*.

The following are marked as additions to the Irish list, but it should be pointed out that many of these records have been already incorporated in Lett's " Musci and Hepaticae " of the Clare Island Survey (*Proc. R. I. Acad.* 1912) and " Census Report " (1915), and also in the " Census Catalogue of British Hepaticae " (2nd edition, 1913) :—

*Weisia curvirostris* var. *commutata*, *Aneura major*, *Marsupella Pearsoni*, *Eucalyx obovata* var. *rivularis*, *Lophozia badensis*, *Sphenolobus Pearsoni*, and *S. exsectus*. *Hypnum Patientiae* should not be included in this list of additions as it is widely spread throughout the counties of Ireland, though nowhere common. Mr. Jones has followed Canon Lett in placing *Moerckia Flotowiana* among the additions to our list, but it was previously found at Malahide and in several other county divisions. No indication is given in the paper of species which are additions to W. Mayo,

## Equisetum litorale.

Mr. Waddell points out to me that in my account of this plant in last number I omitted reference to a Scottish record by W. A. Shoolbred, published in the Report of the Botanical Exchange Club for 1913 (banks of Lough Tummel, Perthshire). The plant is thus known at present from one station in each of the three kingdoms—England, Scotland, and Ireland.

R. Lloyd Praeger.

Dublin.

## Mossy Saxifrages.

In the *Journal of Botany* for June, Rev. E. S. Marshall discusses critically some of the Mossy Saxifrages of the British Isles, on which he has been at work for some time. He finds that *S. incurvifolia* D.Don (for synonyms of this and the other plants mentioned the paper must be consulted) is endemic in Ireland, occurring in Kerry and on the Twelve Bens. The name *S. groenlandica* must disappear from our lists. *S. Sternbergii* Willd. from Brandon in Kerry and North Clare is the true plant. It is not known in Great Britain. *S. rosacea* Moench is the correct name for the plant known as *S. decipiens* Ehrh. (a nomen nudum). Mr. Marshall confirms it from Kerry, Twelve Bens and Clare Island, the only other Britannic station being in Wales. *S. hirta* Smith (not of Haworth, whose name disappears) is accredited to Kerry, Clare, and Tipperary. Waterford and Donegal are added with a query. True *S. hypnoides* L. is also Irish. For further notes Mr. Marshall's interesting paper should be consulted.

# ZOOLOGY.

## Happy Roscommon!

A correspondent sends us the following paragraph from a recent issue of the *Daily Mail* :—

"Rare Butterflies in Flocks.—A remarkable spectacle may be seen now in County Roscommon and, indeed, throughout Central Ireland, where myriads of rare and beautiful lepidoptera are disporting themselves. The lovely peacock butterfly is the most numerous, and clusters of this species may be seen on a single plant. They can be taken in the hand or plucked like fruit from a tree. The swallow-tail, red admiral, painted lady, and many other varieties are here in profusion. It is a record occasion for collectors."

Such enlightenment on an unexpected addition to the Irish fauna will doubtless be received by naturalists in this country with the docility due to the universal knowledge possessed by all writers in our daily contemporary.

## Food of the Crossbill.

Whether the seeds of the Spruce Fir are, in this country, ever eaten by Crossbills is, it appears, still an open question. Mr. Nevin Foster informs me that the spruces in which he watched a party of Crossbills feeding at Hillsborough in 1909 were not the Norway Spruce (*Picea excelsa*) but the Douglas Fir (*Pseudotsuga Douglasii*). It is, I think, a fact of high interest that the seeds of this magnificent American conifer have a place in the Crossbill's menu. It shows, for one thing, a considerable adaptability on the bird's part to new conditions, as the Douglas Spruce cannot have been familiar to it as a wild tree in any part of its range as an Old World species. But this increases the singularity of its conduct in systematically neglecting the cones of the Norway Spruce in this country, if, as has been stated, the same tree in other countries affords it its staple fare.

C. B. Moffat.

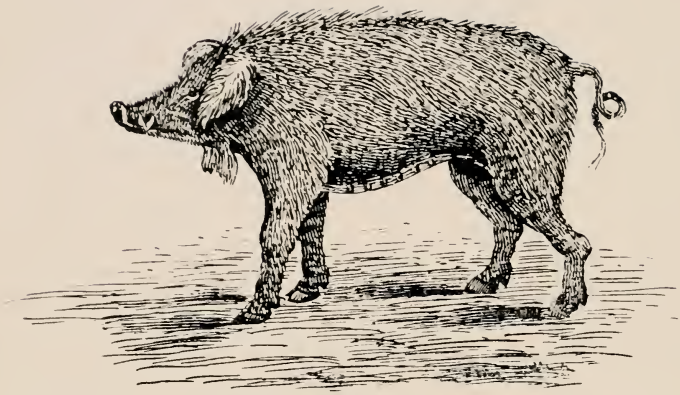
Ballyhyland, Co. Wexford.

## The Effect of the 1916-17 Winter on Birds.

With reference to Mr. Moffat's extremely interesting article in the June issue I can corroborate some of his observations as also applying to Co. Fermanagh, even though we were just east of the severe snow belt. By the way that belt reached right up to the coast line of Sligo, where the road fences were obliterated. I have not seen or heard a single Golden-crested Wren this year. I used to have several pairs nesting round my own house, and the county is generally full of them. It will be very interesting to see how the bird recovers from this devastation. I also always had a couple of pairs of Long-tailed Tits, and they were pretty common in the county. I have not seen any. Neither have I seen any Stonechats, though we generally have a sprinkling, especially at one regular site where I expect them. The Thrushes are very remarkably thinned, though the Blackbirds seem as numerous and troublesome as ever. Of course everyone knows of the mortality among Lapwing and Redwing, and has heard of their feeding in town streets. Mr. Moffat mentions the at least usual numbers of Snipe in the early spring. Curiously enough I had made a note of their extraordinary numbers here—extraordinary at least judging by the noise they made over all suitable snipe-ground. In addition to Mr. Moffat's list, the Grasshopper Warbler did not arrive here at all. If this be true elsewhere it is strange seeing it is a late arrival. I can always count on three or four pairs nesting not far from me, and on hearing many more over the county, especially on arrival. Their absence has been corroborated by Mr. H. E. Rathborne at another favourite locality in the county.

J. P. Burkitt.

Enniskillen.



Ancient Irish Greyhound Pig.
(From an old drawing.)

Modern Representatives of the Ancient Irish Greyhound Pig.
Photographed by Sir Arthur Ball, M.D., on Clare Island.

*To face page* 173.

# ON THE IRISH PIG.

BY R. F. SCHARFF, B.SC., M.R.I.A.

PLATE VIII.

THE breed or breeds of pigs which we notice nowadays in Ireland do not seem to call for any special comment. They do not differ very materially from those found in other countries. They are not active as a rule either mentally nor physically, and they are aided as much as possible by their masters in their efforts to accumulate that quantity of fatty deposit which enhances their value as a marketable commodity. And yet within the last thirty years there existed in certain remote parts of Ireland domestic sows which differed strangely from the ordinary type of the present day. To me the latter appeared so interesting and attractive that whenever I heard of one of these abnormal specimens I endeavoured to obtain a photograph. I have now quite a number of these photographs representing pigs formerly inhabiting Clare Island, Achill Island, Ballina, and Rossmuck in Galway. Even County Wicklow furnished an example, though not nearly so peculiar as those just alluded to. I am reproducing a photograph of a group of three of these strange pigs taken by Sir Arthur Ball on Clare Island in County Mayo about twenty years ago (Plate VIII.) It will be noticed that they are tall active-looking creatures with long heads and bodies, prominent ears and of a greyish colour. At present these links of past generations have probably all been exterminated, for, although interesting from a zoological and historical point of view, it seems that these pigs were not considered fit to survive, as they yielded only poor bacon. They were condemned by the Congested Districts Board, who were as anxious to eliminate all traces of their existence as I was to preserve them.

We may ask why should this peculiar race of pig occur only in the most inaccessible parts of Ireland? Evidently because it had long ago perished in the more up-to-date districts of the country. And this view receives a confirma-

tion from the past records of the Irish pig. The agricultural statistics of about the middle of last century convey to us the information that the tall, long-legged, heavy-eared and coarse-haired pig, known as the old Irish "Greyhound Pig" appeared then to be almost confined to Galway. From the descriptions and illustrations of this pig which we still treasure, there can be no doubt that the peculiar examples above referred to must be looked upon as the last survivors of this ancient greyhound race. The National Museum acquired some of the specimens mentioned from Galway and other parts. Their skeletons have thus been preserved for comparison with those of the genuine ancient breed should the latter ever become available. Skulls and odd bones which may possibly belong to the genuine ancient breed have been compared with those of the more modern specimens collected in the west of Ireland. But a distinct admixture of a foreign strain was noticeable in the latter. The leg bones were thicker and shorter and the face of the skull, as well as the jaws and teeth, had become reduced in length. The modern specimens of the ancient Irish pig acquired by the Museum no longer represent the exact record of that breed, and it is highly probable that the pure strain of the Irish greyhound pig had already vanished in the early part of the last century.

It is of considerable interest therefore to gather all the available information concerning the nature and peculiarities of this ancient "Greyhound" breed and to trace its past history.

The accompanying illustration (Plate VIII.) is the only likeness I could find giving a fairly good idea of this remarkable animal. And yet its head must have been much more elongated than in the picture. A more exact representation is therefore needful and would be most acceptable as a record for the National Museum of Ireland. Sir William Wilde[1] writing in 1854 describes it as tall, leggy, arched on the back and remarkably long in the head with huge pendant ears falling over the sides of the face. He

[1] Wilde, William, "The Food of the Irish," *Dublin University Magazine*, March, 1854.

says it had a knowing look and a bright quizzical eye. It was exceedingly fleet and celebrated for its cunning. We need not wonder that it was companionable and that it became almost one of the family among the Irish peasantry. Its activity and agility must have been extraordinary, and it is said to have cleared a five-barred gate as well as any hunter. Carleton[1] tells us that the backs of the old Irish pigs formed a rainbow arch capable of being contracted or extended to an inconceivable degree and that their usual rate of travelling in droves was at mail-coach speed or six Irish miles an hour, preceded by an outrider to clear the way, whilst their rear was brought up by another horseman going at a three-quarter gallop. This description may be somewhat exaggerated and even more so when he likens the droves of pigs to a flock of antelopes crossing the deserts of the East. Yet an underlying stratum of truth there must be in all these stories which suggest that the Irish greyhound pig was a remarkably swift and agile creature, whereas his modern representative is the very reverse.

A curious feature which we note in the illustration is the pendulous wattles hanging down at the throat or rather at the corners of the jaw. Similar appendages occasionally occur in Normandy pigs according to Darwin[2] and it is quite possible that they were not characteristic of the Irish race, but only appeared in certain litters. From the fact that no wild pigs were known to have analogous appendages, Darwin argued that there was no reason to suppose that their appearance is due to reversion. Since Darwin enunciated these opinions Rolleston[3] pointed out that similar appendages are found in the wild swine of Java—*Sus verrucosus.* Hence the wild ancestors of the Irish greyhound pig may likewise have possessed them.

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[1] Carleton, W., "Traits and Stories of the Irish Peasantry," 3 vols., London, 1896.

[2] Darwin, Charles, "Animals and Plants under Domestication," vol. i (2nd ed.), 1890.

[3] Rolleston, G., "On the Domestic Pig of Britain in prehistoric times" *Trans. Linn. Soc. Lond.* (2) Zool., vol. i., 1876.

The domesticated greyhound pig must have inhabited Ireland for many centuries past. It seems to have been difficult to fatten it for the market and yet the ancient Irish often succeeded in fattening their domestic pigs. In the "Book of Leacon" there is a description of the celebrated hog of Mac Datho which is said to have had nine inches of fat upon her snout, and to have required sixty oxen to move her. Again we read in another ancient record of hogs of broad sides, and of bull-like hogs, while the preservation of pork was well-known in very remote times. The Irish word *saill* meaning bacon occurs in a manuscript of the year 942. There can be no doubt therefore that the art of fattening pigs was understood since early Christian times and that the Irish at all times were fond of pork and bacon.

While the domestic pig was already spread far and wide over Ireland an apparently wild pig (*fiadhmuc*) abounded in the woods and forests. "In no part of the world," says Giraldus Cambrensis,[1] "are such vast herds of boars and wild pigs to be found; but they are a small, ill-shaped, and cowardly breed, no less degenerate in boldness and ferocity than in their growth and shape." That was in the 12th century. It may be doubted whether the account of Giraldus Cambrensis is correct with regard to the ferocity of the wild pig elsewhere. Even the modern continental race of wild boar may be described as cowardly in so far as it does not readily fight except during the breeding season. That the wild swine of Ireland were feared may be gathered from the fact that among the restrictions put upon one of the Kings of Ulster, according to "Book of the Rights and Privileges of the Kings of Erin" (Leabhar na g-Cart), was that he was not to go into the wild boar's hunt, or to be seen to attack it alone. There are other references to wild pigs in early writings and there can be no doubt that they coexisted in Ireland with their domesticated relation since very remote times until about the seventeenth century. There are several words in Irish-Gaelic for the domestic

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[1] Giraldus Cambrensis, "The Topography of Ireland" (revised and edited by Th. Wright), 1881.

and wild pig and the place-names relating to this animal are numerous. The word "mucklagh" means a locality where the wild pigs feed. At Killarney we have "Torc" and "Muckross." Then there are "Inishturk," "Kanturk," and many other names connected with pig and boar.

Now a number of most interesting questions arise from these considerations. We may ask, did the wild pig originate in Ireland or did it migrate to this country from the continent by way of Great Britain? If neither of these suppositions were correct we should have to assume that the domesticated pigs were originally brought to Ireland and that some of these had, in course of time, reverted to their wild ancestral form and habits. The problem is thus much more complex than at first sight appears. It is a well known fact that domesticated pigs very readily revert to the character of their ancestral wild stock. The young are then said to re-acquire the longitudinal stripes which had been lost in a state of domestication, and the boars re-assume their long tusks. Such cases are known from New Granada, Jamaica, Peru, and other places.

If the Irish wild pig had originated in such a manner it would seem that the fossil records should indicate the gradual process of reversion from a domesticated to a wild stock. The oldest Irish skulls and bones should all belong to domesticated pigs, while some of the less ancient ones ought to show traces of reversion to the wild type. We can generally distinguish complete skeletons or even skulls of wild pigs from domesticated ones. The task before us should therefore not be too difficult. And yet it is, because we never find complete skeletons preserved in ancient deposits and even imperfect skulls are of extreme rarity. Let us take for example the ancient deposits which have been brought to light from Irish caves. Pig remains were found in the Kesh caves, County Sligo, the caves of County Clare, and of those of Ballinamintra in County Waterford. In few cases could the presence of the wild pig be ascertained with certainty owing to the extremely fragmentary condition of the bones and teeth. The pigs had evidently formed the food of the people who used the

caves as shelters in past times, and everything was thus broken up while the dogs may have completed the destruction of the skeletons. In most cases where the remains could be identified they certainly belonged to a domesticated stock.

Mr. Armstrong, the Keeper of the Irish Antiquities in the National Museum, was good enough to point out to me that probably the oldest pig remains he had in his charge were those excavated by Thomas Plunkett from a cairn in Co. Fermanagh. As this cairn certainly belongs to the Bronze Age these remains are of special interest. Unfortunately they consist altogether of tusks or lower canine teeth of a boar. They are figured in Mr. Coffey's paper which describes this find.[1] To judge from their great size —a left canine measured 210 mill. $=8\frac{1}{4}$ inches, and a right one 205 mill. $=8$ inches in length, the measurement being taken round the outer edge—I think they must have belonged to a wild boar. Hence wild swine probably lived in Ireland already in pre-Christian times. Then we possess in the National Museum of Dublin the skull of a pig discovered at Killeshandra, Co. Cavan, nine feet below the surface in black turfy mud. This is no doubt very ancient and exhibits all the characteristics of a wild pig. Several other skulls seem to have lain in bogs for a long time, to judge from their colour, but we possess no record as to the part of Ireland in which they were found. Finally we have some specimens of pigs from the Dunshaughlin crannog which dates from about the tenth century, and a few quite modern Irish skulls showing traces of admixture with foreign breeds.

Except the skull from Killeshandra, which seems to be the oldest, all others exhibit distinct traces of domestication, this being more pronounced in the modern ones. So far our enquiries would tend to the conclusion that in very remote times Ireland was inhabited by a wild pig which became extinct a few centuries ago, whereas the domesticated pig was either introduced from abroad or produced in

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[1] Coffey, G., "On a cairn excavated by Thomas Plunkett on Belmore Mountain, Co. Fermanagh." *Proc. R. Irish Acad.* (3) vol. iv., 1896-98.

Ireland by a domestication of the wild stock. It is the latter view I had adopted many years ago and have held until quite recently. Further research, however, has shaken my conviction as to the correctness of this opinion that the ancient Irish domesticated pig has originated in Ireland from a wild stock, and I will state the reasons for my present belief that the pig was originally introduced into Ireland in the domesticated state. This must have taken place long before the Christian Era, either during the Bronze Age or in Neolithic times.

I have already mentioned that the skull of a wild pig can be readily distinguished from that of a modern domesticated one. The alteration in the skull during the course of domestication has proceeded gradually, being almost entirely due to the method of feeding. The wild pig obtains much of its food by burrowing in the soil for succulent roots, fungi, and other materials. The head is thus always on the move and the muscles are exerted to the utmost in the animal's endeavours to provide the necessary sustenance for its body. Strong muscles imply a powerful bony frame to which they are attached. By comparing the skulls of wild and domesticated pigs several striking differences become at once apparent. The skull of the wild pig is elongated to such an extent that the back part is arched over the aperture (*foramen magnun*) at the base of the skull, the jaws are elongated, the teeth are simple in construction, while the lachrymal bone is long. These are, perhaps, the most manifest features of the skull of the wild pig, whereas in the domesticated pig the back part of the skull seems crumpled up, rising straight up above the *foramen magnum* and not arched over it, the teeth are crowded together and more complex in their composition, the jaws, as well as the lachrymal bone, are shorter.

I think it was the eminent Swiss zoologist, Professor Rütimeyer, who first indicated the correct explanation of these interesting osteological characters, and his views have found general acceptance. The changes in the skull during the course of domestication are largely due to mechanical causes. As soon as the wild pig was no longer obliged to exercise his head, in the search for food, to the same extent

as before, the muscles of the skull relaxed and deteriorated. The muscles most affected in this process were the large neck muscles whose function is to move the head. Their attachment to the back part of the skull must have gradually become more restricted, with the result that the arching back of the bones above described grew less pronounced. Changes in one part of the skull affect other parts, and thus we may assume that the profound osteological differences between the wild and domesticated pigs were mainly brought about by changes of habit.

Although the differences in the skull of wild and modern domesticated pigs are so very noticeable that no one can fail to observe them, they are far less so in pig skulls of say a hundred years old than in quite recent ones. In pigs which lived a thousand years ago they are still less pronounced. Let us examine for example a pig skull from an Irish lake-dwelling such as the crannog of Dunshaughlin. This dates from about the 10th century. Pig sties and the modern care of pigs were probably unknown in those days. The herds of pigs belonging to such a community as that of Dunshaughlin must have led a semi-feral existence. They probably obtained their food, to a large extent, in the neighbouring woods and forests. In their habits they approached wild pigs much more than modern domesticated breeds do. And these conditions of their existence impressed themselves on the bones of the skulls. The Dunshaughlin pig skulls differ comparatively little from the skulls of wild pigs. Yet they show clearly the early traces of domestication in the shape of the skull and the dentition, and I have no doubt that the skulls discovered in the crannog of Dunshaughlin belong to truly domesticated pigs. If we go a step further to pre-Christian times, many of the domesticated pigs must then have led a state of existence which scarcely differed from that of the wild pig. Even then there may have been colonies of more advanced and better cared-for pigs which were carefully maintained and fattened. But in those remote times we may assume that some of the domestic stock of pigs took to the forest altogether and reverted completely to a feral condition with resultant alteration in the confor-

mation of their skulls and limbs, after a certain number of generations. Thus it becomes apparent that the problem of determining whether the old domesticated greyhound pig has originated in Ireland from a truly wild ancestor or from a feral stock which was originally domesticated is very difficult to solve, in spite of the fact that we possess a number of very ancient skulls.

Let us now attempt to trace the relationship of the ancient Irish domesticated pig to the breeds of other countries with a view to tracing its origin. If we compare the skull of the Dunshaughlin crannog pig with that found in the Swiss lake-dwellings it will be noticed that the two exhibit a striking resemblance, and evidently belonged to the same breed. Professor Rütimeyer[1] named this ancient swiss pig "Torfschwein" (turf-pig). He was in doubt whether he had to deal with a wild or a domesticated form as the indications of domestication were so slightly pronounced, and applied to it the Latin name *Sus palustris*. Many more remains of this interesting pig have been unearthed in other Swiss lake-dwellings since the days of Rütimeyer, and great strides have been made within recent years in the identification and classification of all objects discovered in these ancient hut sites. It is now possible to affirm that while some of these dwellings and the objects found near them belonged to the Bronze or Iron Age others were much older, being either Neolithic or Palaeolithic. As far as the pig remains are concerned they tend to show the pig has undergone certain noticeable changes, as we should expect, during the long ages that elapsed between the Stone Ages and the Iron Age. Through the courtesy of Professor Studer of Berne I have had the advantage of examining one of the most perfect of the Swiss skulls found at Lattrigen in a Neolithic deposit and comparing it with the ancient Irish crannog pig skulls.

In the size of the two skulls there is a remarkable agreement. Both the Lattrigen and Dunshaughlin skulls possess

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[1] Rutimeyer, L., "Neue Beiträge zur Kenntniss des Torfschweins *Verhandl. der Naturforsch. Gesellsch. Basel*, 1865.

the short canines and the large round eye-sockets, and the back of the skull being more vertical than in wild forms they both indicate that the animals were in a state of semi-domestication. On the other hand the upper row of teeth are somewhat more crowded and complex in the Irish skull than in the Swiss one, and the nasal bones are longer. The lachrymal bone in comparison with that of the Wild Boar is high and short in the Swiss and Irish turf-pig and the skull broad. Altogether although the Dunshaughlin skull is clearly referable to the Swiss turf-pig, it belongs to a somewhat more advanced type than the Lattrigen skull. From the dimensions and figures given of the various Swiss pig skulls by Dr. Otto,[1] the Irish skull appears to approach the La Têne type. The Lattrigen skull is Neolithic in age, whereas the one from La Têne belongs to the early Iron age. Thus it is fairly well established that the domesticated pig which lived in Ireland when the Dunshaughlin crannog was inhabited by human beings, that is to say, about the 10th century, was of the same type and breed as the domesticated pig which roamed about the Swiss lake dwellings a thousand years earlier. Since the Swiss turf-pig had already been domesticated in Switzerland during Palaeolithic times while we possess no evidence of its existence in Ireland at so early a period, it may be assumed that it was imported to this country from the continent and not *vice versa*. This view agrees with the generally accepted opinion that Ireland was first colonized by people coming from the continent of Europe, and it seems likely that some early tribes brought pigs with them which could easily be conveyed across the sea even by primitive boats. That the same breed of pig also existed in England is proved by the discovery[2] of its remains in the lake-village of Glastonbury in Somersetshire. It is believed that this village flourished during the time of the first Roman invasion of England, that is to say, about the same time as the La Têne period.

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[1] Otto, F, "Osteologische Studien zur Geschichte des Torfschweins." Geneve, 1901.

[2] Bulleid, A., and H. G. Gray, "The Glastonbury Lake Village," 2 vols., Glastonbury, 1917.

At the date when this turf-pig was brought to Ireland this country was largely covered by forests as it was for many centuries after. Acorns were no doubt abundant, and there can be no doubt that suitable food for pigs must have been plentiful all over the country. At any rate even long after their introduction to Ireland pigs probably led a semi-feral life. They had no need to adapt themselves to changed conditions, and they thus practically remained for many centuries in the same primitive state as when first introduced. Probably many of them took to the forests altogether, leading there an existence precisely corresponding to that of their ancient wild predecessors. As I remarked before, they would have lost the characters of domestication after a certain number of generations, reverting in every respect to their wild ancestor. "In no part of the world as in Ireland are such vast herds of boars and wild pigs to be found," says Giraldus Cambrensis, "but they are a small, ill-shaped, and cowardly breed, no less degenerate in boldness and ferocity than in their growth and shape." The pigs the writer saw in Ireland in the 12th century were evidently not the wild swine he was accustomed to in England, but the feral descendants of the old domesticated turf-pig.

We have still to determine the origin of the turf-pig. It certainly is not a descendant of the European wild swine which still occur in certain parts of central and southern Europe. The turf-pig is distinguished from the latter by its broad forehead, the round large eye sockets, the shortness of the skull and the high and short lachrymal bone. In all these characters it approaches the wild swine of the East Indies (*Sus vittatus*) much more closely. This resemblance is all the more striking when we compare the turf-pig with the semi-feral pigs of the East, and it seems probable that our ancient domestic pigs have been imported from the East through the Mediterranean region and northward through western Europe to Ireland. This importation, of course, was due to the vast human migrations which took place in the dim and distant past, the early tribes being accompanied in their wanderings by their domestic animals.

We have no evidence of the existence in Ireland in very remote or prehistoric times of a perfectly wild stock of pigs of the eastern type, and we are, therefore, led to the conclusion which I have just expressed. Nevertheless it is a mistake to suppose that only the feral swine mentioned by Giraldus but no truly wild swine lived in Ireland. I have alluded above to a skull from Killeshandra, Co. Cavan, discovered in black turfy mud nine feet below the surface. It presents very striking differences from all other Irish pig skulls. The canine teeth, which are extremely powerful, resemble those found in a cairn in Co. Fermanagh (p. 178) and in some of the Irish caves and bogs. It is most unlikely then that the particular pig to which the Killeshandra skull belonged was an isolated instance, or that it had been introduced from abroad. The skull undoubtedly is that of a genuine Wild Boar of the continental type. The occipital region of the skull is bent far back. The length of the skull from the foramen magnum to the tip of the snout measures 334 mm., as compared with 267 in a skull of the Dunshaughlin type. The upper row of cheek teeth is 120 mm. long, whereas in the Dunshaughlin pig it measures only 109 mm. The upper length of the lachrymal bone is 62 mm., as compared with 43 mm. in the Dunshaughlin skull. The eye-sockets are not round but oval measuring 48 mm. by 43 mm. These and many other measurements I have made, together with the large tusks of the Killeshandra skull, agree with those of the European Wild Boar (*Sus scrofa*). Hence the latter once inhabited Ireland, as it did England and Scotland. It may already have become scarce in Ireland in the 12th century, so that Giraldus Cambrensis only noticed the small and ill-shaped feral pigs infesting the forests. Or the latter may have been especially numerous in the southern parts of Ireland which were those visited by that somewhat credulous Welshman.

Now to return to our Greyhound Pig. Miss L. Stephens pointed out to me that this pig has even penetrated to Denmark. In his history of the Danish pig industry Dr.

Thiel[1] indeed alludes to old records according to which two different breeds of pigs formerly lived in Denmark. One of these which seems to have been established chiefly on the heaths of Jutland had a long arched back, pendulous ears and high thin legs, reminding us of the old Irish greyhound pig. The old Danish invaders may possibly have brought some of these back to their country where, no doubt, another race resembling the north European one was already firmly established. What was its origin? It was clearly not a domesticated descendant of the Wild Boar. It may either have been a large and modified type of the old turf-pig or possibly a cross between the latter and the Wild Boar. Future researches will probably throw light on this fascinating problem. Meanwhile may I urge on those interested in the history of the Irish pig to send any pig skulls that may be dug up in bogs, caves or ancient burial places to the National Museum?

National Museum, Dublin.

# IRISH SOCIETIES.

## BELFAST NATURALISTS' FIELD CLUB.

OCTOBER 24.—OPENING CONVERSAZIONE held in the Carlton Hall. Two hundred members and friends were present. The various sections had interesting exhibits on view. After tea the Vice-President (Mr. A. M'I. CLELAND) took the chair in the absence of the President (Major A. R. Dwerryhouse) at the seat of war. Mr. Cleland referred to the fact that the Club had still some of its original members left and also commented upon the flourishing condition of the Junior Section. Prizes won during the session were presented to several junior members by Mrs. Cleland on behalf of Mrs. Mercier, who was unavoidably absent. During the evening three new members were elected. The remainder of the time was occupied by an exhibition of kinematograph films, illustrating various phases of natural history.

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[1] Thiel, H., "Entwickelung der Schweinezucht in Dänemark,', *Landwirtschaftliche Jahrbrücher*, vol. xxxv. (Ergänzungsb. ii.), 1906.

## ROYAL ZOOLOGICAL SOCIETY.

Recent gifts include a Squirrel from Mrs. Pierce, two Rabbits from Miss R. Murray, a Silver Pheasant from Mr. W. Robertson, two Merlins from Dr. Costello, a Kestrel from Mr. P. Walsh, and a Swan from Major Cotton. A Diana Monkey and a pair of Guinea Pigs have been received on deposit.

## DUBLIN MICROSCOPICAL CLUB.

October 9.—The Club met at Leinster House. The President (N. Colgan) exhibited the hairs or papillae of the seed of the Common Groundsel (*Senecio vulgaris*) which when moistened display a remarkable structure well described by W. A. Leighton in vol. vi., p. 258, of the *Annals and Magazine of Natural History*, 1841. While dry, these short hairs have blunt undivided tips and lie adpressed to the seed, but when a drop of water is applied they spread outwards, slightly bifurcate and discharge from each of the lobes a long spiral thread which under a high power is seen to be made up of several, at least six, strands. Issuing at first with a rapid wriggling motion, these widely diverging threads wave gently to and fro for a time and finally coming to rest surround the moistened seed with a wide fringe of spiral threads, each from three to four times as long as the hair from which it issues, and exceeding in length the breadth of the seed. Hairs of this peculiar structure are not characteristic of the genus Senecio, as one might expect them to be. They do not occur either in *S. Jacobaea* or *S. erucifolius*, two very common congeners of the Groundsel, though they are found in *S. sylvaticus*. Hairs almost precisely similar in form and behaviour were detected by the French botanist, M. Decaisne, so early as 1837 in Ruckeria, a genus of Compositae native in the Cape and are fully described and figured by him in vol. xii., series ii., of the *Annales des Sciences Naturelles*. In this paper he mentions other genera of Compositae as possessing seeds with similar appendages. As for the function of this very curious and complex hair structure, authorities generally regard it as a provision for anchoring the seed and so aiding germination, this object being further promoted by the emission of mucus along with the spiral threads.

D. M'Ardle showed one of the foliaceous group of Hepaticae, *Scapania umbrosa*, Schrader, which he recently collected in Killakee demesne, Co. Dublin, growing on decayed wood. It was collected in the same station many years ago by the late Dr. D. Moore and reported in the Brit. Assoc. Guide for 1878. It is a rare plant and it is interesting to know that it flourishes there still, though reported from Kelly's Glen in 1896; these are the only known Co. Dublin records for the plant. This elegant minute Scapania grows from ¼ to ¾ of an inch in height and is one of the prettiest objects of the genus. The leaves are unequally bilobed to about the middle, the antical lobe serrate in the upper half and beautifully guttulate often papillose at the extremity; the postical lobe is oval acute partly

crossing the stem. Seldom found in fruit on account of the dioeicious character, upper leaves furnished with dark clusters of gemmae, resembling curious septate slipper-shaped spores, and doubtless the plant increases by this asexual mode of reproduction. It is sparingly distributed in the counties of Kerry, Mayo, Donegal, Antrim and Wicklow; several localities in England, and West Inverness in Scotland ; found also on the Continent and in North America.

F. J. S. Pollard showed minute lateral spiracles, six pairs of which he had discovered on the fourth-stage larva of the Warble-flies (Hypoderma). They are connected by fine air tubes with the lateral trunks of the tracheal system, but these minute tubes appear to be partially blocked, and it is unlikely that the spiracles are functional. Hitherto no such structures—even in a vestigial condition—appear to have been recognised in the larva of any muscoid fly.

Prof. G. H. Carpenter showed specimens of the Campodea-like bristle-tail *Symphylurinus Grassii* var. *aethiopica* Silvestri, collected near Johannesburg, South Africa, by Mr. J. W. Shoebotham. The genus belongs to the family Proiapygidae ; it was first discovered by Prof. Silvestri in South America and has been lately recognised by him in a collection from Zululand. (*Ark.f.Zoolog. Stockholm*, vol. viii., no. 1, 1913).

## DUBLIN NATURALISTS' FIELD CLUB.

September 22.—Excursion to Portrane.—Threatening weather was responsible for a small attendance on this excursion. A party of eight started from Amiens Street by the 12.30 train, and reaching Donabate about one o'clock spent half an hour there in examining the interesting little modern church and the fine Wych Elm which grows by the churchyard gate. This monarch amongst Co. Dublin elms, still intact and in full vigour, had a girth of 16 feet 3 inches at about 6 feet from the ground and an 80 feet spread of branches when measured in 1903. On the way to the shore at Portrane the Bank Sedge (*Carex riparia*) was seen in abundance by the alder-lined ditches ; but botanizing was discouraged by the thick drizzle of rain which set in about three o'clock and drove the party for shelter to the ivy-clad ruins of the old church. Here lunch was taken and a business meeting held at which Mr. Lancelot Gubbins was duly elected a member of the Club.

The shore was reached soon after three o'clock, when the rain passed off and Lambay stood out clearly in the offing. Amongst the shells of the beach the Smooth Cockle (*Cardium norvegicum*) was found to be quite frequent in various stages of growth. Pushing southward the well-known beds of the Portrane inlier were reached. Here the conductor, Mr. J. de W. Hinch, explained the geological features of the Lower Silurian volcanic ashes, lavas and crush conglomerates, and the numerous sea caves, half masked by the rising tide, were examined with interest. Along these cliffs the Sea Spleenwort grew vigorously with a profusion of Samphire

and in two spots the rare Sea Wormood (*Artemisia maritima*), recorded for this station nearly a century ago, was found still in full possession. The return to Donabate was made across the Burrow and by field-tracks and a lane where *Cornus sanguinea*, very rare in the county, was noticed growing in the hedges.

Though the rain held off during the latter half of the excursion the sun was veiled and butterflies and moths were absent. As the party crossed the sandy pastures of the Burrow, where the Felwort (*Gentiana Amarella*) was frequent, a fine three-inch caterpillar of the Oak Eggar Moth was seen travelling over the wet grass. The return to Dublin was made by the 6.11 p.m. train.

October 13.—Excursion to Lucan and Leixlip.—Favoured by perfect autumnal weather a party of fifteen assembled at Parkgate Street and travelled to the Spa Hotel by the mid-day tram. Here the Lucan demesne was entered and the Liffey, thanks to recent rainfalls round its head waters at Kippure, was found to be in perfect condition for the lover of river scenery.

The stately trees which line the walk of the river bank immediately attracted attention as the party made its way up stream. A halt was made opposite to the finest Beech in the demesne. This great Beech, which in 1904 gave a girth of 16 feet 3 inches at a height of five feet from the ground, was now found to measure 17 feet 6 inches, an increment of almost 5 inches of diameter in 13 years. A fine Larch close by gave a girth of 12 feet 6 inches, and a Silver Fir of 10 feet 3 inches, both measured at a height of five feet from the ground. It would be of interest to know whether these dimensions are exceeded elsewhere in Co. Dublin, where no doubt, many fine trees which have never been measured lie hidden away in private grounds. Among the trees worth measuring are the Spanish Chestnut, the Sycamore, the Walnut, and the Horse Chestnut. The last named of these attains to a girth of a little over thirteen feet at Ballinclea near Killiney, and offers one of many instances which serve to show that, in Co. Dublin, at least, the largest tree growths are to be found amongst our alien species.

Though the season was rather far advanced for botanizing the Columbine, established here for more than 170 years, was discovered in a gorse spinney along the track from Leixlip Bridge to the Salmon Leap and close by a fine Spindle-tree laden with coral fruit lit up the dark copse with a splash of colour. Ten minutes were spent at the Salmon Leap, which was in fine form, and then hurrying down stream the party reached the old-world village of Leixlip soon after three o'clock. Here there was time to examine the church where a 17th century floor-slab marks the tomb of a sister of Narcissus Marsh, Archbishop of Dublin and founder of Marsh's Library. The Rector, Canon R. N. Somerville, kindly acted as archaeological demonstrator, and piloted the party to the top of the old tower whence a spacious view was had of the Liffey woods and the Rye Water. The battlements of the tower were found to be thickly clad with that pretty alien, the Ivy-leaved Toad-flax,

# NOTES ON APPARENT MNEMIC ACTION IN CHLORA PERFOLIATA.

BY N. COLGAN, M.R.I.A.

ON the 22nd of July last while walking along the abandoned permanent way of the Dublin and South-Eastern Railway between Killiney and Bray, I noticed that the great majority of the flowers of the common Yellow-wort (*Chlora perfoliata*) borne by plants growing exposed to full sunshine were completely closed at 3 o'clock in the afternoon. This suggested to me that the closing of the flowers might be independent of sunlight, and that their behaviour under changed conditions would be worthy of investigation. So several flower-heads were cut off from the growing plants, and taken home as material for experiment. That evening three of the flower-heads with closed flowers having been placed in water in a small glass dish, the dish with the flower-heads was covered with a roomy card-board box so as to exclude the light. On removing the box next morning at 9.15 five of these flowers, from which the light had been continuously excluded since the previous evening, were found to be fully open

This not altogether unexpected result of the first rough experiment was so interesting as to induce me to continue the investigation with greater care and method.

Answers to the following questions were sought :—

(*a*) What is the opening hour of the flowers of *Chlora perfoliata* when covered so as to exclude sunlight ?

(*b*) How long do flowers so covered remain open ?

(*c*) How many times do they open in succession ?

(*d*) Does repeated opening, if it occurs, produce any effect of fatigue or exhaustion in the mechanism of opening and closing ?

(*e*) Do flowers exposed to sunlight behave differently in any of these respects from flowers deprived of sunlight ?

Observations were made on fifteen days between the 23rd July and the 10th August last, and altogether seventy

distinct flowers were dealt with, the flowering heads being taken from plants growing at Killiney or on the North Bull. Two sets of flowers were employed in each series of experiments, one set being covered with a roomy card-board box so as to exclude the light, the other being fully exposed to sunlight in a window facing south. Many of the flowers were in the bud state at the beginning of the experiments, and had certainly never opened. The sets were carefully selected so that each should be made up as far as possible of flowers in the same stage of growth, and throughout the whole course of the observations the covered flowers were kept continuously covered, save for the few seconds when it was from time to time necessary to uncover them for examination.

Omitting details of the numerous observations made, the answers which they yielded to the questions put may be briefly stated as follows :—

(*a*) The earliest opening of a covered flower took place on the 28th July last at 5.30 a.m. clock time, as instituted for Ireland by recent statutory enactments, or say at 4.5 a.m. Dublin mean time, which is approximately the hour of sunrise. Only two flowers, however, were found to open so early, the mean of the first times of opening of seventeen covered flowers being 6.50 a.m. clock time, or 5.25 a.m. Dublin mean time.

(*b*) The duration of opening for different flowers was very variable, ranging from 6½ to 12 hours. The mean duration of opening taken from the mean opening hour of thirty-five flowers and the mean closing hour of forty-two flowers was found to be 9 hours 9 minutes. In Dublin mean time these mean opening and closing hours were 6.6 a.m. and 3.15 p.m.

(*c*) A large number of flowers were observed to open three times in succession ; three flowers opened four times, and one, five times.

(*d*) If retardation of opening be taken as indicating fatigue of the opening mechanism, then no distinct effect of the kind could be traced after three successive openings had taken place. On the fourth opening, however, such a retardation was observed, the mean of the times of fourth

opening for five covered flowers being $2\frac{3}{4}$ hours later than the mean of the first opening of thirty covered flowers. But this retardation is probably an effect of fertilization rather than of fatigue of the opening mechanism. Self-fertilization in this species is effected on the second or third closing of the flower when the stigmas are forced into contact with the opened anthers and with the pollen dusted on the inner surface of the petals, the aestivation being imbricate-twisted.

(*e*) The behaviour of the flowers exposed to sunlight did not differ materially from the behaviour of those kept covered, as set out in the preceding paragraphs. The only marked differences appeared, first, in the retardation of fourth opening of exposed as compared with covered flowers, this retardation for exposed being less than half ($1\frac{1}{4}$ hours) of that for covered flowers ($2\frac{3}{4}$ hours); second, in the time of earliest opening, which was approximately half an hour earlier for covered than for exposed flowers. This difference in the hours of opening may be most conveniently shown thus in tabular form, the times given being Dublin mean time.

Difference in the Times of Opening of *Chlora perfoliata* flowers (*a*) in Darkness, and (*b*) when exposed to Sunlight.

| —— | Earliest opening | Mean of earliest openings | Mean of all first openings |
|---|---|---|---|
| (*a*) In Darkness | 4.5 a.m. | 5.25 a.m. (17 flowers) | 6.6 a.m. (35 flowers) |
| (*b*) In Sunlight . | 4.35 a.m. | 5.57 a.m. (21 flowers) | 6.30 a.m. (53 flowers) |
| Difference . | 30 minutes | 32 minutes | 24 minutes |

The duration of opening of covered and exposed flowers agreed rather closely. For thirty-five covered flowers the mean duration was 9 hours 9 mins., for fifty-three exposed flowers, 8 hours 54 mins., a difference of quarter of an hour.

The results of these experiments show conclusively that the periodic opening and closing of the flowers of *Chlora*

*perfoliata* is not, what it would *primâ facie* appear to be, an instance of that direct response to the stimulus of sunlight so familiar to us in many species of flowering plants. How then are we to explain this action which synchronises with the diurnal advent of sunlight yet has no direct causal connection with it ? It must, I think, be regarded as an example of plant-habit, of memory-like or mnemic activity, to use the language of Semon's theory[1] so ably discussed by Francis Darwin in his presidential address to the Dublin Meeting of the British Association in 1908. Having declared the characteristic *par excellence* of habit to be a " capacity acquired by repetition of reacting to a fraction of the original environment," the President thus proceeds :— " When a series of actions are compelled to follow each other, by applying a series of stimuli, they become organically tied together or associated, and follow each other automatically, even when the whole series of stimuli are not acting. Thus, in the formation of habit *post hoc* becomes equivalent to *propter hoc.* Action B follows action A, because it has been repeatedly compelled to follow it."

On this view the periodic opening and closing of the *Chlora perfoliata* flowers may be regarded as a character or habit originating in an ages-long succession of recurrent light stimuli received at some remote stage in the history of the species. The habit has long since become so ingrained in the constitution of the plant as to operate automatically at a certain stage of growth. It is, in fact, one of that bundle of potentialities mysteriously wrapped up in the seed, which ordain that the germ of *Chlora perfoliata* shall produce precisely that and none other of the 100,000 or so of phanerogamic species which clothe the earth.

As this explanation obviously implies the inheritance of acquired characters it cannot be accepted by those who deny the possibility of such inheritance. They may perhaps take refuge in the supposition that this capacity of the Chlora flower is acquired by each individual plant within the space of its brief life-time as an annual, that the capacity

[1] Richard Semon, *Die Mneme als erhaltendes Prinzip im Wechsel des organischen Geschehens.* Leipzig, 1904.

is acquired, but not transmitted. Granting that this capacity could be somehow acquired by each individual plant in the few months intervening between germination and flowering, the question remains, why does this capacity, the capacity not merely of opening, but also of closing periodically and independently of the direct stimulus of sunlight, not manifest itself in a host of other species exposed to precisely similar conditions? Must we not credit the germ from which the plant springs with a predisposition to produce flowers prone to develop this peculiar capacity, and must we not regard this predisposition as inherited and forming part of the character of the species?

Finally, the obvious objection may be made that the experiments here recorded having been carried out on flowers severed from the parent stem the results cannot be accepted as valid for the complete organism, the growing plant. There seems to be little weight in this objection. The cut flower-heads kept in water showed a very high degree of vitality, remaining quite fresh for a month and developing to full bloom buds which were green when gathered. We have, too, a periodic opening and closing of both the cut flower-heads and the plants growing in the field and the inference seems to be well justified that experiments on complete growing plants would yield results in all respects very similar to those here set forth. Such experiments it would be by no means difficult to carry out as the species is an annual of moderate size.

Sandycove, Co. Dublin.

# NOTES.

## ZOOLOGY.

### Colias edusa near Tramore, Co. Waterford.

*Colias edusa* was not uncommon about here from the beginning of September. Early in that month I took six specimens, five male, one female, at Garrarus and Kilfarrissy, a few miles from here. They fly very fast. The males were in excellent condition; the female a little worn. Since I have taken several more specimens: one on the 29th September, of the variety *helice* of the female, but the front wings were worn.

Coolfin, Portlaw. W. W. FLEMYNG.

## Larva of the Death's Head Moth in Co. Down.

Mr. Wakefield Richardson informed me that he met with the larva of *Acherontia atropos* at Moyallen in a potato field.

W. F. JOHNSON.

Poyntzpass.

## Recent Records of Irish Birds.

To *Novitates Zoologicae*, May, 1917, Prof. Patten contributes a long article on the specimen of the Western Black-eared Wheatear from Tuskar Rock which he already recorded in these pages (*I.N.*, 1916, p. 100), determining the subspecies as the Western Black-eared Wheatear (*Oenanthe hispanica hispanica*. The following communications appear in *British Birds* for the present year:—Bittern in Co. Tyrone (near Coalisland, 2nd Dec., 1916), by W. C. Wright (January No.); Little Bustard in Co. Clare (near Ennis, 20th Dec., 1916), by C. J. Carroll (Feb. No.); Black-winged Stilt in Ireland (Tory Island, April, 1916), by W. J. Williams (March No.); Mortality among Barn Owls in Ireland, by the same (June No.). The Severe Winter of 1916-17, and its effect on Birds in the South of Ireland, by C. J. Carroll (July No.).

## Arctic Skua and Black Tern on Lough Mask, Co. Mayo.

On September 12th, at 4.30 p.m., I observed an Arctic Skua near Inishmaine, Lough Mask. The day was fine with a fairly high west wind. The bird flew very low and swiftly to the south and passed about eighty yards from our boat. On the following day at 6.50 p.m. I noticed a Black Tern north of Saint's Island; it was flying leisurely southwards, just above the surface of the water, now and then darting down for food. The bird was quite close to the boat and I was able to identify it easily.

ROBERT F. RUTTLEDGE.

Bloomfield, Hollymount, Co. Mayo.

## Snowy Owl in Co. Antrim.

My friend, Mr. Herbert Malcomson, had the interesting experience of examining a fine specimen of the Snowy Owl (*Nyctea nyctea*) at Messrs. Robbins, taxidermists, which was shot near Glenavy about 12th November, 1917. According to the latest edition of the British Ornithologists' Union List of British Birds this species is a winter visitor between September and April to the Shetland and Orkney Islands, and not unusual in the Inner and Outer Hebrides and the mainland of Scotland.

It has occurred in England in the eastern and southern counties more than twenty times, while in Ireland more than thirty examples have been recorded, chiefly from the north and north-west.

W. H. Workman.

Windsor, Belfast.

## Departure of Swifts.

I having been at home during all the month of August this year, I have been closely watching the departure of the Swifts, *Cypselus apus*, from here. It may be stated that at the close of the season these birds are mainly in evidence only in the mornings and evenings. At the beginning of the month the Swift population here was estimated at about 100, and on the 4th there appeared to be some diminution, but up till 11th there were still 50-60 flying about. From 12th till 14th the numbers dropped to 10-20, and afterwards the numbers seen were as follows :—

| August | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 4 | 3 | 1 | 1 | 1 | 5 | 2 |

| | 30 | 31 | September | 1 | 2 |
|---|---|---|---|---|---|
| | 1 | 1 | | 6 | 3 |

Mr. A. W. Stelfox informs me that he saw one at Bangor on 11th September—an unusually late date for the North of Ireland. So far as I know only two later occurrences have been reported in the *Irish Naturalist*, viz., vol. xii., p. 320, and vol. xxi., p. 246.

Nevin H. Foster.

Hillsborough, Co. Down.

## Hoopoe in Co. Donegal.

An adult female Hoopoe (*Upupa epops*) was shot at Greencastle, Co. Donegal, on the shore of Lough Foyle, about 15th September last, by Mr. R. H. Nolan, B.E., of Londonderry. I have only note of one other occurrence of the species in this district, about twenty-five years ago at Eglinton, Co. Derry.

D. C. Campbell.

Londonderry.

In September last a female Hoopoe (*Upupa epops*) was shot at Greencastle, Co. Donegal, by Mr. R. R. H. Nolan, B.E., on the shores of Lough Foyle, a very interesting record of one of our rarer migrants. The B.O.U. list of British Birds remarks :—" To Ireland it is a spring and autumn visitor and occurs almost annually, most frequently in March

in the southern counties, but it is not known to nest there." I well remember what pleasure I got when I first saw a Hoopoe in the wild state, it was flying across the Arab cemetery outside Constantine, Algeria.

W. H. Workman.

Windsor, Belfast.

## Wood Wren in Fermanagh.

On 18th May, 1917, Mr. H. E. Rathborne heard and saw a Wood-Wren, *Phylloscopus sibilatrix*, near the north shores of Lough Erne. I was unfamiliar with the bird but along with him saw it, still keeping to the same spot, on the 28th May. Between then and the 7th June Mr. Rathborne had heard either this bird or another one about half a mile away. But on the 7th June we could find neither bird. For the short time we watched it we detected no mate. I much regret I had not time to spare to find out if there was a nest. When heard its song was constant, interspersed with call notes.

J. P. Burkitt.

Enniskillen.

# BOTANY.

## Cardamine amara in East Tyrone.

This plant, in Ireland confined to Ulster where it is rare and local, has been already recorded from this county (*Irish Naturalist*, February, 1915.) In the early summer of this year (1917) some time was devoted to working out its distribution in this locality. Its headquarters appear to be a marshy meadow on a small tributary of the Ballinderry River about four miles from the town of Cookstown; in this meadow it grows in great abundance accompanied by such plants as Caltha and various species of Carex and in drier ground with *Geum rivale*. It next appears in Tullylagan demesne, in many spots along this same stream generally on some sandy bank; it has also invaded a "made bank" here, constructed to prevent the river from eating away the soil; and grows among the dry sward, and there is a large bed of it again at a wier half a mile below Tullylagan bridge. Further down stream it occurs here and there in Loughry demesne, but not in any great quantity. I also re-discovered it on the Ballinderry River near the old church of Derryloran, close to Cookstown; this must be the station noted in "Irish Topographical Botany" from "Flora of Ulster" and misspelt Derryloan. The formation underlying the bed of this stream is Carboniferous sandstone.

Thomas Greer.

Curglasson, Stewartstown, Co. Tyrone.

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ALEX. THOM AND CO., LIMITED, DUBLIN.

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MARCH, 1917.

# The Irish Naturalist



A Monthly Journal

ON

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PROF. GEORGE H. CARPENTER, M.Sc., M.R.I.A.
AND
R. LLOYD PRAEGER, B.A., B.E., M.R.I.A.

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AUGUST, 1917.

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