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ORGAN OF THE

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Photo *R. P. Hatch.*

SLEEPING HOLE OF TREE-CREEPER.

The Irish Naturalist.

VOLUME XXXII.

THE SLEEPING HABITS OF THE TREE-CREEPER.

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

PLATE I.

A SHORT time ago, Mr. A. C. Davies of Lenaderg, Co. Down, informed me that he had been observing the sleeping habits of the Tree-Creeper, *Certhia familiaris*, in his neighbourhood. His observations showed that these birds excavated holes in the bark of *Sequoia* (*Wellingtonia*) *gigantea* into which they crept at nightfall and there spent the hours of darkness, their backs being approximately on a level with the surface of the tree's bark, and their beaks pointing straight upwards. Presumably the birds take hold with the claws of their feet, and are assisted in maintaining their position by means of the distal ends of the stiff tail feathers being pressed against the bark, as obtains when these birds are climbing tree-trunks or branches in pursuit of food. The bark of this tree is soft and fibrous in texture, and hence it proves a task of little difficulty for the birds to excavate these sleeping-chambers.

An examination of some twenty trees of this species which are growing here (all situate in an area of about 8 acres, the distance between the two furthest apart being

almost 300 yards) shows that almost all of them bear one or more of these sleeping-holes (in one case eight) at heights varying from 4 to 12 feet above the ground level, and it may be that others would be found at higher elevations. There does not appear to be any uniformity in the location of these holes in respect to outlook, as they are to be found facing every point of the compass. Some of the holes examined appear of old standing and not to have been recently used, but others are evidently quite fresh and their occupation is marked by a few breast feathers adhering to the bark round the edges, and by the deposition of faeces immediately beneath each hole. The latter can be clearly seen in the photograph [Plate I.]. As will be observed, the surface of the bark is very uneven—deep furrows separating the longitudinal ridges—so that in these trees the thickness of the bark varies from about $1\frac{1}{2}$ to 4 inches, and in spots probably even more. The bark thickness in Californian trees is said to be from one to two feet. The halfpenny (one inch diameter) indicates the size of the sleeping-hole, beside which it was placed for this purpose.

There are also growing here two trees of *Sequoia sempervirens*, but in these, though the bark is of similar texture, none of the sleeping-holes could be found. Perhaps this may be accounted for by reason of their trunks being branch-clothed down to the ground, whereas, as a rule, there are no branches on *S. gigantea* lower than about 8 feet.

The Tree-Creeper, though nowhere numerous, is a common species throughout Ireland where trees occur, and doubtless the twenty Hillsborough trees afford sufficient sleeping accommodation for the birds resident in the district. But the question suggests itself :—in districts where there are no Sequoias—and I presume these trees are only to be found sparingly in this country—where do the Tree-Creepers spend their nights ?

Hillsborough, Co. Down.

TO READERS OF THE *IRISH NATURALIST*.

HAVING served as one of the Editors of this Magazine since its foundation in 1892, I desire on my withdrawal (due to retirement from the Royal College of Science for Ireland at the end of the year 1922) to bid farewell to the contributors and readers whose support and co-operation has made the work a privilege and a pleasure. The *Irish Naturalist* has provided a bond of union between students of nature and societies of nature-lovers in all parts of the country, and its thirty-one completed volumes contain many papers of permanent value to biological and geological science. To have been granted participation in such work is truly cause for thankfulness.

During the past few years, the Magazine has passed through troublous times, but the testimony to its value shown by the friendly and ungrudging help of its supporters has been an added encouragement to those responsible for its management. Personally I wish to thank most heartily the friends who have faithfully stood by the *Irish Naturalist* through the recent period of danger and trial. We may hope that the worst of the difficulties are now over, and that the Magazine may serve as an enlightening and unifying influence in the new conditions on which Ireland is entering.

Supporters of the Magazine will notice with hearty satisfaction that the vacancy on the editorial staff is filled by that talented and ardent naturalist, C. B. Moffat, whose articles on varied aspects of science have been among the most valuable and attractive contributions made to our pages.

The editorship in which I have for so long been permitted to continue has afforded opportunity for welcome friendship as well as for scientific effort. To colleagues and helpers I would offer assurance of grateful remembrance and heartfelt wishes for continued and increasing success.

GEO. H. CARPENTER.

Dublin, December, 1922.

IRISH SOCIETIES.

BELFAST NATURAL HISTORY AND PHILOSOPHICAL SOCIETY.

October 31.—Mr. Henry Riddell, M.E., delivered his presidential address to the members of the Society, in the old Museum, College Square North. His subject was a review of the work and personnel of the Society since its foundation just over 100 years ago. The address, which was listened to throughout with close attention, was illustrated by numerous lantern slides.

The President said that his information was derived from minutes and proceedings of the Society, and for the greater part of the facts he was indebted to the secretary, Mr. Deane, who had ransacked a century's papers, and without whose labours it would have been practically impossible to complete the centenary volume, a prospectus of which would shortly be issued. It was on Tuesday, 8th June, 1821, that eight men, anxious to promote the study of natural history, met in the house of Dr. Jas. L. Drummond, at 5, Chichester Street, and formed the Society. These were—Dr. Drummond (President), Jas. McAdam (Vice-President), Robert Patterson, George C. Hyndman, James Grimshaw, Robert Simms, Wm. McClure, and Francis Archer. They were all young and energetic, the two youngest being nineteen and twenty, while the oldest was only thirty-one. The Society steadily grew, and in 1827 the need of better accommodation was felt, and it was determined to embark on a bold scheme and build a home for themselves. Belfast at that time was a small town, but the community was most enterprising, generous, and public spirited. Ultimately, the building in which they met that night was erected, the foundation-stone of the Museum being laid by the Marquis of Donegal on 4th May, 1830. The President then showed on the screen specimens from the Museum collections, with a view to drawing attention to the value and unique interest of the ethnographical objects which, he said, were at present inaccessible to students or to the general public. He wished to emphasise this point very strongly, and hoped that the Corporation would be able to accommodate the collections in their new museum. In modern times people were too busy to take the same active interest in the work of the Society as they did in the times with which he had dealt. The Council of the Society had now in most cases to content themselves with bringing before the members the latest thought or the newest discovery, and in doing so they played a most important part in the education and development of the instinct for science which was seldom absent in their fellow-citizens.

On the motion of Colonel Sinclair, C.B., a hearty vote of thanks was passed to the President.

BELFAST NATURALISTS' FIELD CLUB.

OCTOBER 24.—The President (Rev. W. R. Megaw, B.A.) gave his inaugural address, the title of his subject being "In the Heart of the Country." The average countryman's ignorance of common wild flowers and birds was shown by examples of the confusion which reigns in his mind concerning the commonest denizens of the field. Only a very few of our resident birds are named accurately, and the native flora, with a few exceptions, are weeds without any attempt at distinction. Little more than one-third of our native grasses receive the scant attention of a local name; to say that there are over sixty species in our three north-east counties is to run the risk of being thought a fool. The forty sedges of the same area are either not seen at all or relegated to the obscurity of unknown grasses. The lecturer mentioned some peculiar and amusing theories found in the heart of the country regarding sex differences in plants, and the turning of certain plants into others more or less similar in appearance. Medicinal uses of herbs was discussed, and the *modus operandi* explained. Nature's strange moods, her freaks, her fancies, her kindness and severity were commented upon and illustrated. Extracts from the diary of an amateur naturalist were read, pourtraying wild life in strange and varied circumstances. The lecturer concluded by giving examples of country superstitions regarding plants and their potent properties. The address was freely illustrated by a series of fine lantern views, especially a set of twenty showing the four seasons of the year. In the subsequent discussion the following members took part:—N. H. Foster; R. J. Welch, and S. A. Bennett. Two junior and thirteen ordinary members were elected.

NOVEMBER 21.—W. A. Green read a paper entitled "The Kingdom of Mourne," which dealt fully with the history, archæology, and geology of the Mourne Mountains and their vicinity. In the discussion which ensued, R. J. Welch, J. Holness, and J. A. S. Stendall took part. Three ordinary members and one junior member were elected.

DECEMBER 19.—Prof. Gregg Wilson, M.A., D.Sc., lectured on "The Life-history of a Fish."

The lecturer said it was extraordinary that so little is known of the life of the fishes that abound in the waters all round us. It was not till as late as 1864 that the great fact was discovered that most of our fishes produce eggs that drift about in the surface waters. Even yet there is much to be made out as to the wanderings of some of our most important types. For long it was generally believed that fishes spawned in waters close to the shore, and that the spawn was actually secured to weeds or gravel at the bottom of the sea. It is now known that spawning is largely offshore, and that the eggs and larvæ may drift many miles before the young fishes are able to care for themselves. The number of eggs produced by fishes is often enormous, amounting in some cases to ten or even twenty millions. But those fishes that take most care of their eggs seem to require to produce fewer than their neighbours.

The time required for hatching out also varies enormously—from a few days or a few weeks, to five months or more in the case of such fishes as skates, which have large eggs with much stored food. The newly-hatched fishes are usually utterly unlike their parents, and are often protected by being quite transparent. They abound in surface waters and feed on the microscopic organisms that exist there. As both eggs and larvæ are at the mercy of currents the drift of the waters is of great interest, and study of this subject has brought home to us the fact that no district is independent of its neighbours. That is the justification for an international scheme of fishery research. The rate of growth of fishes has been much studied of late. It is of great interest to find that the shoals that frequent certain coasts are largely composed of fish of one age ; year after year young recruits appear to take the place of the older fish, which pass on to new territory. The migrations of fishes are as interesting and as mysterious as those of birds. One fact stands out clear—namely, that the spawning migrants tend to swim against the currents to regain the position lost by the drifting eggs or larvæ. Perhaps the most remarkable illustration of this is found in the behaviour of the Eels, which swim thousands of miles to deposit their eggs in waters whose slow drift brings the young Eel to our shores after a journey that occupies years. As fishes have many enemies, they also have many protective devices. Colour adaptations and mimicry play no small part in securing freedom from attack. Spines, and in some cases poisonous secretions associated with spines, are also valuable safeguards.

A discussion took place, in which the following took part :—The President (Rev. W. R. Megaw, B.A.) ; R. S. Slipper, M.A. ; J. McCaw, B.A. ; J. J. Holness ; and R. J. Welch, M.R.I.A. With the election of one junior and ten ordinary members the proceedings closed.

NOTES,

ZOOLOGY.

Greenland Wheatear in Co. Derry.

On 21st October, 1922, a Wheatear was shot at Maghera, Co. Derry. The bird on dissection proved a female, and having a wing measurement of upwards of 100 mm. it belongs to the large (Greenland) race (*Œnanthe œnanthe leucorrhoa* (Gmel.)). I have to thank Dr. N. F. Ticehurst, who kindly examined the specimen and confirmed my diagnosis. He says "for a female this (wing measurement) is alone conclusive, but in addition the big tarsi and the amount of black on the outer tail feathers are quite confirmatory."

Nevin H. Foster.

Hillsborough, Co. Down.

Egg of Fulmar Petrel.

Referring to Mr. J. A. Sidney Stendall's note on an Irish egg of the Fulmar Petrel, *Fulmarus glacialis* Linn. (page 96 *ante*), I have examined an egg taken in Co. Donegal on 29th May, 1922. This egg is of normal size, measuring 73 × 48 mm.

NEVIN H. FOSTER.

Hillsborough, Co. Down.

Birds at the Tearaght Lighthouse.

We had a visit on the Tearaght Rock from the Red-necked Phalarope on the 1st October; it remained with us for about fifteen minutes when it was chased by the Rock Pipits. It took to the sea on the south side. This is the first visit from this bird noted. We also had the Black Redstart and Redstart, two Grey Phalaropes, one Woodcock, five Goldfinches, and various other common birds on the 26th October. For some time past we have had the Goshawk (I informed Mr. R. F. Ruttledge of Hollymount, Mayo); it re-appeared at the end of October and is still on the rock. The habits of this bird are most interesting. We have an aerial wire from one side of the cliff to the other. Every evening about sunset the bird tries to alight on this wire. This wire is greased, and the bird is unable to perch. The Choughs rest for the night near the dwelling-house on the side of the cliff; the Goshawk rests among them for the night. It is no trouble to it to kill rabbits and we have watched it put up some fierce fights with Peregrines.

A. J. KENNEDY.

Tearaght Rock, Co. Kerry.

Kingfisher at Blackrock, Co. Dublin.

It may interest readers to know that a few days ago I flushed a Kingfisher in a bush overhanging a dry pond in Blackrock public park. My little daughter of ten was with me, so I asked her to watch as I had marked the bird down. I flushed it again and it flew over her head and she saw the brilliant blue of its back and the ruddy brown characteristic of this lovely little bird.

H. W. DOVETON-DUNLOP.

Blackrock.

Stock-Dove breeding in Co. Londonderry.

On 15th June, 1921, Mr. W. G. Byron found two nests of the Stock-dove in rabbit-holes in the sand-hills near Castlerock, Co. Derry.

Londonderry. D. C. CAMPBELL.

Thracia pubescens near Dublin.

While exploring the South Bull in Dublin Bay recently I picked up a single valve of *Thracia pubescens*. Mr. A. R. Nichols and Dr. R. Ll. Praeger were kind enough to examine it, and apparently it is a fossil shell, but rarely found in Ireland. Birterbuy Bay appears to be the only spot on the Irish coast where a live specimen had been found.

Dublin. JOHN A. S. PALMER.

Mr. Palmer's finding of *Thracia pubescens* in Dublin Bay is very interesting. The Irish records are very few (see Nichols, "Marine Mollusca of Ireland," Proc. R. I. Acad., 1900) and may be grouped as Belfast Lough, Dublin Bay, Cork Harbour, and Birterbuy Bay in Connemara. Of these, the only station where living specimens were certainly obtained is Birterbuy Bay (a fine specimen in Dublin Museum). The Belfast specimens were undoubtedly fossil: the Turbot Bank is a famous deposit of fossil shells: Grainger obtained it in the Belfast Estuarine Clays, and myself in the similar deposits in Larne Lough. The Cork records are so far as I know unsupported by specimens, and it is not stated whether the specimens were recent. But as the species lives in Connemara it may well do so at Cork. The only Dublin record is very vague;—"Near Dublin, Mr. Warren" (Thompson, vol. iv.) The British distribution is very restricted—the south-western coast only: but in his "Additions to British Conchology" (Journ. of Conch. viii and xiv), Mr. Marshall unexpectedly adds a few Scottish records which seem more or less doubtful. The foreign range is exclusively southern, extending from Britain along the Mediterranean and south to the Canaries.

The species is then clearly one of the southern forms which flourished as far north as the Ulster coast during the Neolithic climatic optimum (to which the Belfast and Larne Clays belong), but which has since retreated to the slightly warmer waters of the west and south coasts. Mr. Palmer's valve is I think certainly fossil: no trace of the ligament remains, and the shell is blackened and opaque—not nearly so fresh in appearance, indeed, as the Larne fossil. Its past and present range is paralleled by that of *Gastrana fragilis*, found fossil in Neolithic clays at Downpatrick and Clontarf, and still living on the west and south coasts of Ireland, south-western England and thence on to the far end of the Mediterranean.

The Shetland record (Forbes, Brit. Assoc. 1850) and the single valve from Drontheim (Jeffreys, vol. ii., p. 368), as well as the single valve from Campbelltown and other Scottish records, I would be inclined to refer to fossil relics of the Neolithic fauna. There is a Greenland record which seems more than doubtful.

R. LLOYD PRAEGER.

Dublin.

A FORTNIGHT'S ENTOMOLOGY IN CO. WATERFORD.

BY OLIVER E. JANSON, F.E.S., AND L.H. BONAPARTE WYSE.

HAVING spent a pleasant holiday collecting insects in Kerry, chiefly in the Killarney district, in June, 1919, of which we published an account in the *Irish Naturalist*,[1] we were desirous of resuming our activities there the following season, but the troubled state of affairs in the South of Ireland rather discouraged us, and the projected trip was postponed indefinitely. This year, however, we decided to take our courage in both hands, and having received reassuring letters from correspondents in Ireland, our minds were soon made up. But instead of returning to Kerry, we proposed breaking new ground and visiting Waterford and Lismore, which had the merit in our eyes of being comparatively little worked. And here it may be remarked, that all our fears of disagreeable incidents were happily without foundation, that during our brief visit we met with unfailing courtesy from all with whom we came into contact, though towards the end of the second week of our stay the political situation had already assumed such a menacing aspect that we thought it prudent to return home without further delay. Under more normal conditions we should have liked to have stopped on a week or two longer.

We left London on the evening of June 23rd, taking train from Paddington to Fishguard, and from thence by steamer direct to Waterford, which we reached early next morning. We soon found suitable accommodation at the Adelphi Hotel, and after a wash and a good breakfast, we set out immediately for Milepost, a long Irish mile north of Waterford. The weather was overcast, but the general dulness was relieved by occasional gleams of sunshine, and we were full of hope of seeing that local butterfly the Greasy Fritillary (*Melitæa artemis*) in its native haunts; but, although we spent much time tramping up and

[1] Vol. xxix. pp. 1–6, 61–64.

down the limited extent of marshy ground on which one of us first met with it more than twenty years ago, this most interesting of Irish butterflies failed to gladden us with its presence. This may have been due to the weather or perhaps to the complete clearance within recent years of an extensive fir-plantation which sheltered the locality from the north wind. After our fruitless search, we thought it more profitable to divert our attention to the coleoptera, and by looking under stones and sweeping various plants, several common species were obtained, of which perhaps the best were—*Taphria nivalis, Oxypoda longiuscula, Actobius cinerascens, Stenus flavipes, S. bifoveolatus, Cercus rufilabris,* etc. Next day being Sunday, little work was done, but in the morning a visit was paid to Roanmore, the old home of the Wyse family, and in the demesne the only noteworthy capture was a specimen of the handsome Shield-bug *Pentatoma prasina.* In the afternoon we went to Tramore and called upon Captain W. Penrose, who made us stay to tea and promised us letters of introduction to the Dean of Lismore and to the agent of the Duke of Devonshire to view the famous old castle. On Monday, June 26th, we commenced work in earnest, and spent the whole day collecting on Kilbarry marshes in close proximity to Waterford City. The weather was fairly sunny, and a good many beetles were taken of which the following may be enumerated: *Anchomenus marginatus, A. viduus, Bembidium aeneum, Hydroporus vittula, Ochthebius pygmæus, O. bicolon, Gnypeta labilis, Tachyusa atra, Stenus incrassatus, S. canaliculatus, Adalia bipunctata, Donacia simplex, Chrysomela polita.* Two visits were paid to the sandhills near Tramore, on the 27th and 30th, and numerous beetles were taken or observed. We found the sea-shore leading to the sandhills rather more productive than the hills themselves. By lifting stones many beetles were discovered, mostly common species, of course, but the following are worth recording:—*Notiophilus substriatus, Harpalus rubripes, H. tardus, Amara curta, A. similata, Dichirotrichus pubescens* (varying from pale yellow to quite black), *Pogonus chalceus, Metabletus foveola, Quedius boops, Ocypus ater, Bledius spectabilis, Nacerdes melanura,*

Hypera punctata. On the sandhills proper some interesting species were unearthed such as :—*Falagria thoracica, Choleva chrysomeloides, Serica brunnea, Phyllopertha horticola, Lacon murinus, Helodes minuta, Timarcha laevigata, Gastroidea polygoni, Heliopathes gibbus, Sitones griseus, Tychius squamulatus*. Two beetles call for special mention on account of their great abundance : *Timarcha laevigata* and *Philopedon geminatus*. The first-mentioned occurred in hundreds in sheltered spots on the sandhills and on account of its large size and gregarious habits was very conspicuous. Strange to say, this is apparently the only known locality for it in Ireland. The weevil, *Philopedon geminatus*, occurred on the barer parts of the sandhills, and in company with the 'lamellicorn' *Aegialia arenaria* might be seen at any time toiling up steep sand-banks and, before surmounting the obstacle, tumbling to the bottom and recommencing immediately, apparently undismayed, the same perilous ascent. This might be repeated dozens of times, but the indomitable little creatures would never give in until success crowned their efforts, affording an example of perseverance that might even render Bruce's spider envious ! Another visit was made to Tramore on June 29th, and the western side of the Bay explored by way of the Doneraile Walk, Cliff Walk and the road leading to the Metal Man, an imposing figure of a sailor on a high pillar pointing towards the sea to warn away shipping from the dangerous rocky coast. Here quite a different fauna from that of the sandhills was noted. In the flowers of Ox-Eye Daisy and Yellow Sea Aster, the pretty green beetle, *Psilothrix nobilis*, was found commonly. The Rose-beetle, *Cetonia aurata* was another interesting capture, of which an example was seen flying in the sunshine and taken as it settled on a stone wall. Both these local species have been already recorded from Tramore, but their re-appearance after several years' interval is of interest. Other species taken during the day were :—*Leistus fulvibarbis, Amara plebeia, Olisthopus rotundatus, Quedius cinctus, Xantholinus glabratus, Lagria hirta, Otiorrhynchus ovatus O. muscorum, Sitones griseus.*

Having now pretty well exhausted the immediate environs of Waterford, we were anxious to explore new ground and see what Lismore and the surrounding country might produce in the way of coleoptera. We left Waterford accordingly on July 1st, in torrents of rain which, however, abated as we neared the old town after a voyage in the train of two or three hours. We had intended to put up at the "Devonshire Arms" but found that this old-established hotel had quite recently closed down. This was a disappointment, but luckily our friend Captain Penrose of Tramore had provided us with a letter of introduction to the Dean of Lismore, who received us most hospitably and actually put himself to the trouble of finding suitable accommodation for us at Mrs. Hale's Private Hotel, where we were made as comfortable as possible for the remainder of our stay. The kindly Dean, who only lived a stone's throw away from the hotel, begged us to take tea with him and his wife, and both entertained us with many good stories racy of the soil. The Dean afterwards showed us over the beautiful grounds of Lismore Castle, of which we did not fail to admire the wonderful old avenue of beech trees. In the evening after dinner, we strolled down to the river Blackwater and took a few beetles, but nothing calling for special mention. Next day, after Sunday devotions, we spent most of the afternoon collecting on the banks of the Blackwater, and found the usual riparian species there and a few others of more than ordinary interest, such as :—*Chlænius nigricornis* and the rare var. *melanocornis*, *Anchomenus augusticollis*, *Bembidium decorum*, *B. punctulatum*, *Laccobius oblongus*, *Philonthus quisquiliarius* and var. *dimidiatus*, *Silpha dispar*, *Cryptohypnus dermestoides*, *C. iv-guttatus*, *Gastroidea polygoni*. On Monday, July 3rd, we decided to collect in a new locality and walked to Balliaspie woods about two miles due south-east of Lismore, situated on rising ground. Many of the trees, mostly firs, had been cut away within recent times and nothing but the unsightly stumps remained. Here a few lepidoptera were flying about us, *Cidaria populata* (plentiful), *Venilia macularia*, *Bomolocha fontis*; but the coleoptera came in for most attention, and the

following were noted:—*Pterostichus cupreus, Bolitobius exoletus, Anatis ocellata, Malthodes marginatus, M. pellucidus, Athous niger.* On the whole, this was one of the least productive spots we had yet struck, so we felt compelled to put out our maximum effort next day, July 4th, and make the ascension of one of the Knockmealdown peaks. One of our chief objects in coming to Ireland was to turn up the rare and beautiful alpine beetle, *Leistus montanus*, which is perhaps commoner in Ireland than in any other part of the United Kingdom. But as this rarity is scarcely ever found below an elevation of fifteen hundred feet, it entailed both a stiff climb and a long walk to reach a suitable mountain where it might be found. We decided that the only way of reaching our objective was by motor car, but such was not easily procurable, for soon we had tidings that all available cars had been commandeered by the Irregulars who were in possession of the town. Our landlady, however, who tactfully managed to keep well with all parties, had soon found us a car in charge of a well set up young fellow of inflexible demeanour. In a moment we were rushing at break-neck speed through the town, and across the beautiful stone bridge over the Blackwater, and up the Glen to the Gap, a distance of about seven miles. Not a word was spoken during our exciting course, but we could not help admiring the skill with which our chauffeur negotiated the exceedingly sharp turnings of the narrow mountain road. On alighting in the Gap at the foot of one of the highest peaks of the Knockmealdown range, our guide informed us that we had already reached an altitude of over one thousand feet, that there yet remained another thousand to reach the top. He advised us to follow the stone wall which here marked the boundary between Waterford and Tipperary counties, to the top and he would wait for our return. We immediately commenced the ascent at a slow pace, turning over stones as we proceeded, and had not gone far before we were taking such characteristic high ground species as *Leistus rufescens, Harpalus latus, Trechus obtusus.* When we had climbed about five or six hundred feet and had reached a total height of between fifteen and sixteen hundred feet, the first *Leistus montanus* was taken under a stone and

was followed at short intervals by two or three others, but this good fortune was not continued during the remainder of our ascent, only one or two more examples being captured. But other mountain beetles were observed as :—*Nebria gyllenhali, Pterostichus vitreus, Olisthopus rotundatus, Patrobus assimilis,* etc. On the top of the mountain we were met by a piercing blast and a driving mist that rendered collecting almost impossible and obscured the view, though glimpses of the imposing range of the Galtees to the north were obtained from time to time. Here, in the shelter of a huge heap of stones we had our frugal lunch with occasional nips of *aqua fortis* to keep out the cold. We returned to the Gap by the same way as we had come, and in the same bit of ground found a couple more *Leistus montanus* and single specimens of *Cychrus rostratus* and *Carabus catenulatus.* We found the chauffeur and the motor car awaiting us on the road, and in a very short time we were speeding towards Lismore which we arrived at in time for tea. And so ended a most eventful day.

On July 5th we walked to Cappoquin and followed the right bank of the Blackwater for the first couple of miles. Along the shore, in suitable places, a few beetles were taken—chiefly Bembidia—of which one or two species are worth mentioning as :—*Bembidium concinnum, B. decorum.* From shrubs and trees a few weevils were swept as :—*Orchestes fagi, Strophosomus coryli, S. retusus, Liophlœus nubilus, Miccotrogus picirostris, Ceuthorrhynchus marginatus.* About half way to Cappoquin we were obliged to take the high road as our river path gave out. On the road, numerous specimens of the common Cinnabar Moth (*Euchelia jacobææ*) were found settled, their bright colours making them very conspicuous. We had a good tea at Morrison's Hotel in Cappoquin, and returned to Lismore by train in the rain. Next day, July 6th, there was more rain, which rather damped our ardour, but towards evening it cleared up considerably, and once more we sallied forth in search of specimens. We found some promising ground in the Glen on the banks of the Owenasshad river, a tributary of the Blackwater. Here some new things were taken as :—*Calathus piceus* under stones, and *Anthobium ophthalmicum, Cychramus luteus, Grammoptera ruficornis*

Anaspis rufilabris, A. maculata on the flowers of Fool's Parsley. We were so pleased with this new locality that we returned to it next day, July 7th—and last day of our stay in Lismore, and by searching under stones at the edge of the water, the following beetles came to light :—*Bembidium decorum, B. atrocoeruleum, B. tibiale, Orechtochilus villosus* (common), *Anacæna limbata, Homalota* (*Atheta*) *currax, Ocypus compressus, Stenus canaliculatus, Hydrocyphon deflexicollis* (common). The flowers of Fool's Parsley were very attractive to insects of different orders—chiefly hymenoptera and diptera and also coleoptera—and to the list of those latter already taken the preceding day may be added the ' longicorns ' *Grammoptera tabacicolor, Rhagium bifasciatum, Leiopus nebulosus.* Had the weather been warm and sunny, it is quite possible that other species of this interesting group—so poorly represented in Ireland—might have been taken, for the locality was eminently suitable. We separated after an hour or so collecting here, as one of us was anxious to try a nice-looking spot higher up the river beyond the Glen, which we had singled out during our memorable motor drive on the 4th. But this ground proved most disappointing, producing only a few common ' Bembids ' and single examples of *Carabus catenulatus* and *C. granulatus.* On returning to Lismore, a specimen each of *Cychrus rostratus* and *Staphylinus erythropterus* were obtained under stones in the Glen, and these were our last captures in Ireland. We left Lismore in the late afternoon and arrived in Waterford rather late the same evening. We remained the night there, and next evening embarked for England in the same steamer, ss. *Waterford,* which had brought us over, and so our holiday came to a close.

To the Dean of Lismore and Captain Penrose, and their amiable consorts, we feel deeply indebted for services rendered and kind hospitality which contributed much to the success and pleasure of our holiday. We tender to them our grateful thanks, with the hope that the friendship so pleasantly begun may be renewed some day in the near future.

We find after having sorted out our captures that they comprise some two hundred and eighty species of coleoptera,

two of which are new to Ireland, and more than fifty are now recorded for the first time from Co. Waterford. The two new Irish species are :—*Amara curta*, Dej.—A specimen of this ground-beetle occurred under a stone on the Tramore sea-shore 27. vi. '22. (L.H.B.W.) This species is scarce and very local in Britain ; most of the specimens in collections are from Deal, where it has occurred commonly on the sand dunes ; it has also been recorded from Yorkshire and the Forth district of Scotland.

Tychius squamulatus, Gyll.—Six specimens of this weevil were obtained on the Tramore sandhills on flowers of *Lotus corniculatus*, 27, 30. vi. '22. (O.E.J.) In Britain this species is mostly found in the southern chalky districts and has also been recorded from Suffolk, Oxford, Barmouth and Southport.

The species new to Co. Waterford number fifty-five. We have initialed those species in which only one of us succeeded in taking examples, and have followed, for the sake of reference, the nomenclature of the Irish List.[1]

Cychrus rostratus, L.—Two specimens, one on Knockmealdown, and the other in the Glen near Lismore. (L.H.B.W.)

Carabus catenulatus, Scop.—Two specimens, Knockmealdown and banks of Owennashad River. (L.H.B.W.)

Notiophilus substriatus, Wat.—Two specimens on Tramore strand, 27. vi. '22. (L.H.B.W.)

Leistus montanus, Steph.—Seven specimens on Knockmealdown, 4. vii. '22.

L. rufescens, F.—Common on Knockmealdown.

Nebria gyllenhali, Sch.—On the higher slopes of Knockmealdown, a few.

Chlaenius nigricornis, var. **melanocornis**, Dej.—One specimen with pale femora and tibiæ would seem to be referable to this rare variety, 2. vii. '22. (L.H.B.W.)

Harpalus rubripes, Duft.—One example ♀ on Tramore strand, 30. vi. '22. (L.H.B.W).

Pterostichus vitreus, Dej.—Two specimens on Knockmealdown, 4. vii. '22.

Amara plebeia, Gyll.—Tramore, 29. vi. '22. (O.E.J).

A. similata, Gyll.—Several specimens on Tramore strand, 27. vi. '22. (L.H.B.W.)

Calathus piceus, Marsh.—Lismore, a few.

Anchomenus angusticollis, F.—Lismore.

A. viduus, Panz.—Waterford, 26. vi. '22.

Olisthopus rotundatus, Payk.—Common on Knockmealdown.

Bembidium aeneum, Germ.—Waterford, Kilbarry marshes, 26. vi. '22.

[1] A List of the Beetles of Ireland. By Rev. W. F. Johnson and J. N. Halbert. (1902).

B. tibiale, Duft.—Lismore, a few by Owennashad River, 7.vii. '22. (O.E.J.)

B. decorum, Panz.—Lismore, common on banks of Blackwater and Owennashad rivers.

B. concinnum, Steph.—Three specimens on banks of River Blackwater, Lismore, 5. vii. '22. (L.H.B.W).

Patrobus assimilis, Chaud.—A few on Knockmealdown at a high elevation; 4. vii. '22.

Metabletus foveola, Gyll.—Tramore, 30. vi. '22.

Laccobius sinuatus, Mots.—Lismore, 2. vii. '22. (O.E.J.)

Ochthebius pygmaeus, F.— } Waterford, Kilbarry marshes, 26. vi. '22.
O. bicolon, Germ.— } (O.E.J).

Oxypoda longiuscula, Er.—Waterford, 24. vi. '22. (O.E.J).

Homalota (Atheta) currax, Kr.—Lismore, 7. vii. '22. (O.E.J).

H. atricolor, Sharp.—Tramore, 30. vi. '22. (O.E.J).

Tachyusa atra, Grav.—Several on Kilbarry marshes near Waterford, 26. vi. '22.

Falagria thoracica, Curt.—Tramore, 30. vi. '22. (O.E.J).

Quedius cinctus, Payk.—Tramore, 29. vi. '22. (O.E.J).

Q. boops, Grav.—Tramore, 27, 29, 30. vi. '22.

Ocypus ater, Grav.—Tramore, 30. vi. '22. (L.H.B.W).

Philonthus quisquiliarius, Gyll., and var. **dimidiatus,** Er.—Both were taken on banks of Blackwater, 2. vii. '22. (O.E.J).

Actobius cinerascens, Grav.—Near Waterford, 24. vi. '22. (O.E.J).

Stenus incrassatus, Er.—A few specimens on Kilbarry marshes, Waterford, 26. vi.' 22. Not recorded in the ' List ' but taken since publication by Rev. W. F. Johnson, in Co. Sligo (*I.N.* xiv. 253).

S. canaliculatus, Gyll.—Waterford, 26. vi. '22. (O.E.J).

Bledius spectabilis, Kr.—Tramore, females only, 27, 30. vi. '22.

Silpha dispar, Herbst.—Two specimens on right bank of Blackwater, near Lismore. 2. vii. '22. (L.H.B.W).

Choleva (Catops) chrysomeloides, Panz.—Tramore, 27. vi. '22. (O.E.J).

Cercus rufilabris, Latr.—Waterford, 24. vi. '22. (O.E.J).

Cychramus luteus, F.—Lismore, common on flowers.

Enicmus transversus, Ol.—Waterford, 24. vi. '22. (O.E.J).

Lacon murinus, L.—Tramore sandhills, 27. vi. '22.

Cryptohypnus dermestoides, Herbst.—Lismore, 2. vii. '22.

Helodes minuta, F.—Tramore, 27. vi. '22. (O.E.J).

Cyphon nitidulus, Thoms.— } Lismore, 5. 7. '22. (O.E.J).
Malthodes dispar Germ.— } Lismore, 5. 7. '22. (O.E.J).

Gastroidea polygoni, L.—Tramore sandhills, 30. vi. '22. and Lismore, 2. vii. '22.

Phaedon armoraciae, L.—Waterford, 27. 6. '22. (O.E.J).

Galerucella nymphaeae, L.—Tramore, 27. vi. '22. (O.E.J).

Phyllotreta exclamationis, Thunb.—Waterford, 26. vi. '22. (O.E.J).

Nacerdes melanura, Schmidt.—One specimen on Tramore strand, near racecourse, 27. vi. '22. (L.H.B.W).

Aplon ulicis, Forst.—Lismore, 7. vii. '22. (O.E.J).

A. scutellare, Kirby.—Lismore, 7. vii. '22. (O.E.J).

Otiorrhynchus muscorum, Bris.—Tramore, 29. vi. '22. (O.E.J).

REVIEW.

A LABORATORY MANUAL.

Practical Zoology for Medical and Junior Students. By J. D. F. GILCHRIST, M.A., D.Sc., Ph.D., Professor, and C. VON BONDE, M.A., Lecturer in the University of Cape Town. Pp. 329. 105 illustrations. Edinburgh: E. & S. Livingstone, 1922. Price 20*s*.

This book was originally intended for the use of elementary students in South Africa, and therefore includes descriptions of special types peculiar to that region. In order to make the book suitable for European students, descriptions have been added of the types usually studied in these countries.

Comparing the book with those classics of the laboratory Parker's "Zootomy" and Marshall and Hurst's "Practical Zoology," one notes several departures from their methods. First there is the extensive employment of diagrams to illustrate the various dissections. These are of course supplemented by descriptive instructions for dissections, but one fears that many students will be tempted to copy the diagrams, and neglect the instructions, thus failing to gain that knowledge of the work which comes through carefully following Parker or Marshall and Hurst. The book is interleaved with blank paper for sketches, but this is too thin to be serviceable, and its proximity to the diagrams only increases the temptation to copy these.

The book is excellently printed and bound, and is remarkably free from errors, typographical or otherwise; in one or two of the diagrams there are negligible errors of detail. Altogether, the book is very suitable for junior students in the hands of a careful teacher.

D. S. T.

NEWS GLEANINGS.

Our readers will be glad to learn that Belfast at last is to have its new Natural History Museum and Art Gallery, so long delayed by the war, the Corporation at the monthly meeting on October 2nd, having confirmed the minutes of the Museum and Literary Committee, recommending the Council to go on with the building, the plans of which were ready in 1914. On the declaration of war in August, 1914, advertisements were already in the Belfast papers inviting tenders for the erection of the first section at a cost of about £30,000, the finished building to cost £50,000 in all. This has now been much exceeded, £80,000 is to be spent on the first section. The building will be erected in the Botanic Park, close to the University, and will contain a lecture room or theatre which can be used by the local scientific and art societies. It will have a separate entrance from the Stranmillis Road.

NOTES.

ZOOLOGY.

Shakespeare's "Scamel."

I wish to put forward what I believe to be a possible solution of a problem which has hitherto baffled the commentators of Shakespeare. In the "Tempest" Act ii., Sc. ii., there occurs this passage :—

> I'll bring thee
> To clust'ring filberds, and sometimes I'll get thee
> Young scamels from the rock.

It has been thought that the word "scamel" is a misprint for "seamal," *i.e.*, sea-mew (seagull) or for "Stannel" a Kestrel. For instance, in Whittingham's edition (1814) which I happen to have at hand, "sea-mells" is the word used. In Newton's "Dictionary of Birds," pp. 814, 815, the following note occurs :—Scamel, a word used once by Shakespeare . . . that has given rise to many conjectures . . . but is commonly accepted as a bird's name, a signification rendered more likely by the fact that at Blakeney, on the coast of Norfolk, it was applied to a Godwit (Stevenson, B. Norf., ii., p. 260), though it is not to be supposed that Shakespeare used it in that sense. It seems to be otherwise unknown."

The word "scameler" is used to my knowledge at Ardkeen, Kircubbin, and Portaferry on Strangford Lough, and is an uncommon local name for the Red-breasted Merganser (*Mergus serrator*). Confusion between this bird and the Sheldrake occurs easily in the popular mind. This is exemplified by the fact that in some places the local name "Scale-duck" refers to the Sheldrake (*cf.* "Newton's Dictionary," p. 814), while at Strangford Lough "Scale-duck," or more commonly "Scalers," is the folk-name for the Merganser. I conclude that this confusion actually occurred when the name migrated to England from Scotland, its birthplace in all probability. So the Sheldrake is called "scameler." It is, however, possible that the word came to be used more generally (perhaps especially of ducks) just as "sea-gull" as used popularly includes a number of different species.

My belief is that in Shakespeare's time "scamel" or "scameler" was a name for the Sheldrake used possibly in the loose manner of many local names, and perhaps also used, even then, of the Merganser. At any rate since it is likely that Shakespeare heard the name in England, and since the Sheldrake nests in England, but the Merganser does not, it is almost certain that if Shakespeare had any particular bird in mind it was the Sheldrake.

My reason for believing the word to have come from Scotland is that the majority of the people where the word is used are of Scottish descent, immigrants at the time of the Plantations.

Perhaps "scamel" may yet be tracked to its lair in North Britain !

Belfast. EDWARD A. ARMSTRONG.

Our correspondent raises a question of which many solutions have been offered—as will be seen on reference to such standard works as Furness's "Variorum Edition of Shakespeare," and Wright's "English Dialect Dictionary"; but the re-raising of the subject should be welcomed as affording to Irish students the opportunity of throwing any fresh light that has fallen into their hands on a still unsolved enigma.

The most remarkable feature common to all the meanings that have been proposed for the word "scamel" in the passage in question is that not one of them is free from some strong objection. It is to be feared that in this respect the Shellduck and Merganser will fare no better than other claimants; for, as neither of these birds rears its young on rocks, Caliban would be promising himself rather a "wild goose chase" in making the offer he did if either of them were the creatures in his mind.

If, however, this objection be over-ruled, and birds nesting elsewhere than on rocks held admissible, a strong claimant at once presents itself in the Bar-tailed Godwit, for which, as stated in Stevenson's "Birds of Norfolk" and confirmed by later writers (see Kirk Swann's "Dictionary of English and Folk Names of British Birds") the term "scamel" is still in actual use among shooting men in some districts of East Anglia.

In Newton's "Dictionary of Birds" the Godwit is definitely and rather abruptly set aside, the nature of its breeding-haunts being probably the sole reason for its exclusion from the list of possible claimants. Evidently, no critic is remorseless enough to suggest that Shakespeare may have fallen into a mistake as to where the Godwit nested; and Professor Trench, whom we have consulted on the subject, rules out as equally untenable the hypothesis that Shakespeare purposely made Caliban commit a blunder. If, however, this objection is fatal to the Godwit, it must be equally so to any other species whose young are not reared on rocks.

Such readings as "sea-mew," "sea-mall," "sea-gell," and even "stannel" (*i.e.*, the Kestrel)—supposed to have been corrupted by careless printing into "scamel"—have apparently been put forward to get rid of the difficulty that none but a rock-nesting creature will do One may reasonably question, however, whether either young gulls or young Kestrels would have been esteemed a tempting offer for Stefano's "royal table." In this respect, at least, the Godwit has a marked advantage over the other claimants; but the field is clearly open for other suggestions, and we hope that some may yet be put forward.

C. B. Moffat.

Dublin.

THE STUDY OF COMMON WILD FLOWERS: A PLEA FOR CLOSER INVESTIGATION.

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

[Read before the Dublin Naturalists' Field Club, 11 January, 1923].

I THINK I may be allowed to occupy a small part of your time in inviting your attention to some of the fields of study that I think are open to the most amateur investigators in the study of common plants.

The late Mr. Colgan, in some letters he wrote to me just a year before his lamented death, informed me that he was comparing a number of common plants with the descriptions given of them in standard works on botany, and was struck with the degree to which they often failed to correspond. In some cases the points on which he found disagreement are such as would need the eye of an expert botanist to follow up the inquiry. For instance Mr. Colgan found that the fruit of the common Yellow Bedstraw (*Galium verum*), which is described in the standard manuals (Babington's, for instance) as glabrous, is in County Dublin specimens wrinkled when ripe ; and some heads that I sent him from Co. Wexford were in this respect similar to the Dublin ones ; but I think microscopic investigation would have to be undertaken by those who wish to follow up an inquiry on this subject. In other cases, however, the field of investigation is open to everybody. Mr. Colgan was particularly struck with the fact that the common Bird's-foot Trefoil (*Lotus corniculatus*) is described in the leading manuals as having from five to ten flowers in a head. (This is the statement in Babington's Manual, Groves' edition, 1904, while in Bentham's Handbook the estimate is still higher, and the umbels are said to be of " from five or six to twice that number of bright yellow flowers ".) Whereas in Mr. Colgan's own experience the number of flowers

never exceeded five. Here we have certainly a disagreement worth following up. I may state that I was able, in reply to Mr. Colgan's request, to find a few heads of this plant with as many as six flowers, but nothing to corroborate such an estimate as "from five to ten," and nothing to throw doubt on the validity of Mr. Colgan's finding so far as the Counties Dublin and Wexford are concerned, that five is the usual number of flowers on a good head.

In looking into this matter, I was struck with the fact that while botanists seem to have over-stated the number of flowers proper to a head of *Lotus corniculatus* they have under-stated those of the nearly allied Greater Bird's-foot Trefoil (*Lotus uliginosus*), which is unfortunately not very common about Dublin, though abundant in most parts of Counties Wicklow and Wexford. Bentham describes it as having only from six to eight flowers per head. Babington more generously accords it from eight to twelve. In Co. Wexford I found heads of twelve so plentiful as to make Bentham's estimate of from six to eight seem almost absurd. I found also a few heads with fourteen flowers, and I believe that had I been in the country when the species was in its fullest bloom I would probably have found such heads to be fairly numerous. I cannot help thinking that questions of this kind are worth more careful investigation, and that they also make it appear probable that many similar ones might be found equally calling for more research.

Another question in which it is known that Mr. Colgan took extraordinary interest was that of the proper assignment to different species of their characters as annuals, perennials or biennials. In his 'Flora of County Dublin" he gives the results of his investigations so far as they were completed when he wrote that book. I think his results show that a great deal of further investigation is needed, for although we will find in any of the leading manuals a character under this heading assigned to each plant, we not infrequently find that the best authorities differ, and even when they agree, Mr. Colgan's investigations sometimes show that they have only agreed in being wrong. I will take as instances of the singular contradictions proved by a comparison of Mr. Colgan's results with the verdicts

of Babington and Bentham, four plants well known to all students of our Dublin flora—the Sea Poppy (*Glaucium luteum*), White Climbing Fumitory (*Corydalis claviculata*), English Stonecrop (*Sedum anglicum*) and Black Medick (*Medicago lupulina*).

The first of these plants (*Glaucium luteum*) is set down in Babington's Manual as a biennial, while in Bentham's Handbook it is called an annual. In Colgan's Flora of Dublin it is pronounced neither a biennial nor an annual, but a perennial.

Corydalis claviculata is in Babington a perennial, in Bentham an annual. Mr. Colgan here confirms Bentham and reverses Babington, finding the plant an annual.

Sedum anglicum, rather curiously, is, on the contrary, called an annual by Babington and a perennial by Bentham. Mr. Colgan again confirms Bentham and finds the plant a perennial.

But in the case of *Medicago lupulina* the two great standard authorities are more nearly in agreement ; Babington, without definitely deciding which it is, says "annual or biennial." Bentham, more confident, says "annual." Colgan here finds both equally wrong ; *Medicago lupulina* is a perennial

I don't think it is possible to avoid seeing in the preceding results that there must be many other cases that still deserve inquiry.

Then even such simple questions as the flowering seasons of plants need closer investigation. One of our members (Mr. Athole Harrison) has within the past two summers brought me convincing evidence that the flowering season of the beautiful Yellow Mountain Pansy (*Viola lutea*) is curtailed to an extraordinary degree in all our chief text-books, which describe the plant as flowering in June and July. Mr. Harrison finds it in plenteous bloom in its County Dublin haunts (even in a very backward season like that of 1922) during the last ten days of April, and as he finds it still out in fair profusion as late as the 29th of August, I feel no doubt that April to September would be a better description of the flowering season than June and July.

In County Wexford I have always found that one of the earliest signs of approaching spring—the spring that begins a new year before the old year is quite gone—is the flowering on the surface of pools of the Greater Ivy-leaved Crowfoot (*Ranunculus Lenormandi*) which I almost invariably found beginning to bloom in the last week of December, so that it followed not long after the leafing of the Honeysuckle and the singing of the Stormcock. It was always, in my neighbourhood, far in advance of its small cousin *Ranunculus hederaceus*. Yet I find that the manuals make it the later of the two, and begin the flowering season of *hederaceus* in April, and that of *Lenormandi* in May.

The brambles, which are as impossible of investigation to ordinary mortals as the great nebula in Orion, have still a borderland on which it is possible to touch ; and I find that the flowering seasons of the more easily distinguished kinds differ to a most extraordinary degree. The kind that is far the most abundant in our own limestone neighbourhood (*Rubus rusticanus*, formerly called by the more suitable name *discolor*) is from four to six weeks later about coming into bloom than the very different-looking kind (a form of *Rubus macrophyllus*) that prevailed most largely on the Silurian soils of north Wexford, and is also common in the more mountainous parts of County Dublin and when we get away from the limestone. I think such a difference as this must be a good mark of real specific distinctness. Yet in the latest edition of Babington's Manual I find that the flowering seasons of all the brambles —except a few widely separated forms—are set down as exactly the same (July and August).

I very much wish, too, that more attention was paid in our text-books to the very attractive subject of the scents of flowers. Of course we are beset with the difficulty that we cannot describe the scent of a flower unless by saying it is like (and it is seldom exactly like) the scent of something else. But I confess that I think it too bad when I find both in Babington's Manual and in Bentham's Handbook a distinct statement that that delightful little flower the Marsh Violet (*Viola palustris*) has no scent. They both expressly call it scentless. Evidently neither

of the authors ever held a bouquet of it to his nose. The scent of a single flower might, perhaps, not be perceptible. But a small bunch of *Viola palustris* is delightfully fragrant, and the scent is, moreover, quite unlike that of any other flower which I have any recollection of having smelt.

While this is, I think, the most glaring case of a misdescription with regard to smell that I have come across, it is clear that very little attention has been paid to the subject at all by our principal standard authors, who, in their descriptions even of strongly scented plants, generally omit to state that they exhale odours of any kind. Neither Babington nor Bentham mentions that one of our St. John's-worts (*Hypericum Elodes*) smells strongly of curry and that one of our Bedstraws (*Galium palustre*) fills the air with the fragrance of honey; but I regret to say that popular writers are very fond of telling us that the smell of the Common and Water Figworts (*Scrophularia nodosa* and *aquatica*) has a striking resemblance to that of decaying meat, and that the fondness of wasps for these two flowers is largely to be accounted for by the deceptive likeness in their smell. I grant that the smell of the Figworts is extremely disagreeable; but *except in being disagreeable* I can detect no similarity between it and that of flesh in any condition or stage. Of course, it is possible that my nose may be at fault in the matter. But in any case my point is that the whole subject of the smells of flowers and plants wants closer examination, and I think a beginning might be made by finding what different species of plants smell exactly alike, and what others come very near them so as to need a keen nose to tell the difference. As far as I can make out, there is no difference between the odours of the two common Figworts; but, I would be delighted to know that some one else found them to be not perfectly the same, or at least could say that one was a little stronger than the other. It would then be of much interest to ascertain to which of the two our third Dublin species, *Scrophularia umbrosa*, showed the closest resemblance in regard to smell.

Then I need hardly say that the study of the habits or economy of plants involves a good deal of attention to the

insects that visit them, and a taking of careful notes on the conduct of the insects when so engaged. It is true that a very large amount of attention has already been paid to this subject, and volumes written upon it that afford delightful reading ; but it is far from being an exhausted field, and I am convinced that some of our really common flowers are still misunderstood.

As an instance I will mention the Rest-harrow (*Ononis repens*), which is common enough about Dublin to be within nearly everybody's range of study. Of this plant you will find it stated in Lord Avebury's fascinating little book "British Wild Flowers considered in relation to Insects," that it secretes no honey, but is visited by bees for the purpose of collecting the pollen, which, of course, is brought home to the nest to make bee-bread for the young. Now Lord Avebury, of course, had good authority for the statement he has made, and I am not aware that it has ever been contradicted. But I have notes of seeing the Rest-harrow visited in County Wexford by large numbers of male bumble-bees of more than one species ; and as it is certain that the males of this family of insects do not collect pollen, or take any part in the bringing home of food for the young, I find it very difficult to reconcile their evident fondness for the flowers of the Rest-harrow with what seems to be the received opinion that it does not secrete honey.

However, in my perplexity I turned again to Lord Avebury, and found that I had not been the first observer of this peculiar fact—the fact of the Rest-harrow being sometimes visited by male bees. It had been observed by Müller, the great German authority on the subject of cross-pollination in the plant-world by insect agency ; and Müller's explanation is that the male bees go to the Rest-harrow by mistake, "in a vain search for honey." Now here we have an explanation that might do very well if the visits were occasional ; but I am bound to say that it does not fit the circumstances of the visits observed by me in a little field in County Wexford where I was observing the habits of bees on several days in August, 1919.

In this little field *Ononis repens* was growing abundantly,

and with it, in equal profusion, another plant that is certainly much liked by the males of every species of bumble-bee—the Black Knapweed (*Centaurea nigra*). Generally, in my neighbourhood, I found the Black Knapweed not merely *a* favourite flower, but *the* favourite flower, of male bumble-bees of most kinds. But in this field where the Rest-harrow also occurred the bulk of the bees kept away from the Knapweed, and kept on regularly passing from flower to flower of the species that Müller says they only go to by mistake. I even saw one male *Bombus agrorum* make what seemed to be a mistake—dart at a head of Knapweed (the colours of the two flowers being somewhat similar), but turn away in disgust on finding that the flower it was making for was only Knapweed and not the Rest-harrow.

Now, I ask, is it credible that all these bees were idiotically passing the long day in a continued vain search for honey in flowers that contained none, and in the midst of a forest of flowers of another kind, which they knew to contain honey exactly to their liking ?

But we cannot say that the Rest-harrow does secrete nectar till the nectar has been found. I am only pleading for research into the subject. Readers of Darwin's " Fertilisation of Orchids " are aware that for a long time many of our common Orchises (*maculata, Morio* and *pyramidalis* amongst others) were supposed to secrete no nectar, and to be visited by bees only on a mistaken quest ; but it was ultimately found that the bees knew well enough how to get at the fluid they were in quest of by puncturing the inner membrane of the nectary that contained it. If any similar discovery has since been made about the Rest-harrow I have never seen it mentioned. I can only say that to me this plant is quite a conundrum.

At any rate, I feel sure that inquiry into these and similar questions cannot fail to be of interest, and to elicit results that will give us an increased sense of the harmony of nature.

Dublin.

IRISH SPHAGNA.

BY WILLIAM A. LEE.

The list of Irish Sphagna published in the *Irish Naturalist* for February, 1922, can now be supplemented by further records which have become available. They include some kindly placed at my disposal and a few which resulted from my own gatherings, mainly in the counties of Dublin and Wicklow last year. In all cases the specimens have been examined by Mr. J. A. Wheldon, M.Sc., to whom I am under much obligation. The records are additions to the botanical divisions indicated and, where an asterisk appears, the name was not included in my previous list :—

S. fimbriatum Wils. var. tenue Grav. 37 (Hunter).

S. Russowii W. var. *rhodochroum Russ. 34 (Hunter).

S. plumulosum Roll. emend. W. var. viride W. f. *laxum W. 21 (Lee). 38 (Lee).

var. coerulescens Schlieph. c. frt. 8 (Armitage).

var. purpureum W. 37 (Hunter).

var. versicolor W. C. frt. 8 (Armitage).

f. validum W. 20 (Lee). 37 (Hunter).

f. tenellum W. 20 (Lee). 21 (Lee).

f. *ascendens W. 20 (Lee). 37 (Hunter).

var. flavofuscescens W. c. frt. 8 (Armitage).

var. ochraceum W. f. immersum W. 20 (Lee). 21 (Lee).

f. *congestum W. c. frt. 21 (Lee).

S. cuspidatum Ehrh. var. falcatum Russ. f. molle W. sub-f. *tenellum W. 21 (Lee).

var. plumosum Schimp. f. *remotum W. 29 (Tetley).

S. molluscum Bruch. var. vulgatum W. f. *compactum W. 37 (Hunter).

S. inundatum R. et W. var. ovalifolium W. f. brachycladum W. 21 (Lee).

f. *brachyanocladum W. 20 (Lee).

f. densum W. 21 (Lee).

S. auriculatum Schimp. var. *tenellum W. 21 (Lee).
var. ovatum W. f. *brachycladum W. A starved state. 21 (Lee).
f. *pallidoflavum W. 21 (Lee).
f. variegatum W. 21 (Lee).
var. *cano-virescens W. 20 (Lee). 21 (Lee).
S. crassicladum W. var. diversifolium W. f. *inundatum W. 37 (Hunter).
S. rufescens Nees et Hornsch. var. magnifolium W. f. *rufidulum W. A small starved state. 21 (Lee).
sub-f. densiramosum W. 37 (Hunter).
S. papillosum Lindb. var. normale W. c. frt. 8 (Armitage).
f. confertum W. 34 (Hunter).
S. cymbifolium Ehrh. var. glaucescens W. 8 (Armitage).
var. pallescens W. 21 (Lee).
f. confertum Wheld. 21 (Lee).
var. fuscescens W. c. frt. 8 (Armitage). 21 (Lee).

Rock Ferry, Cheshire.

IRISH SOCIETIES.

DUBLIN MICROSCOPICAL CLUB.

JANUARY 10.—W. F. GUNN drew the attention of members to an extremely portable microscope which he had recently acquired.

The instrument is made by Swift and Sons, London, and by an ingenious method of folding is made to pack into a leather case measuring only 7½ by 3½ by 3½ inches.

Although occupying so small a space when packed, it is steady enough to admit of the use of the highest powers, and is fitted with double nosepiece, coarse and fine adjustments, stage condenser and a graduated drawtube adjustable to any length between the limits of 100 and 200 mm.

BELFAST NATURALISTS' FIELD CLUB.

JANUARY 16.—R. J. WELCH read a paper on "The Zoology and Botany of Heraldic Charges and Ladies' Book-plates." A discussion followed, after which eight members and two junior members were elected.

NOTES.

ZOOLOGY.

Sleeping Habits of the Tree-Creeper.

The account given by Mr. Nevin Foster in the January number (pp. 1-2) of the sleeping habits of this species as observed by him at Hillsborough is of extraordinary interest ; but I do not find that in parts of the country where *Sequoia gigantea* happens not to be an abundant tree the Tree-Creeper considers it necessary to excavate hollows in which to pass the night. In Co. Wexford it sometimes resorted to natural crevices. At Ballyhyland I frequently observed a bird of this species retiring at dusk into a crevice between the bark and the trunk of an old and decaying Ash, which grew not more than a quarter of a mile away from the nearest Wellingtonia, and so would appear to have been preferred by the Creeper. A still more common roosting-place is probably against the trunk of any rough-barked tree, and this is the kind of situation in which the bird is described as passing the night by Mr. T. A. Coward, in his admirable little two-volume work "The Birds of the British Isles and their Eggs" (1919–20).

C. B. Moffat.

Dublin.

Sandwich Terns at Rosslare, Co. Wexford.

On September 21, 1922, I met with a party of Sandwich Terns resting on the sands at Rosslare, Co. Wexford. By cutting through the sandhills I succeeded in getting within about twenty yards of them and watched them for quite half an hour. There were 21 birds in the party on the sands and three or four other terns were fishing some little way out to sea, but I cannot say definitely that these were Sandwich Terns, though from their size I judged them so, and one, which came ashore and joined the others, certainly belonged to this species. Fortunately there were few people about that afternoon, so the birds were not disturbed much, though indeed they did not seem to mind unless the passers-by came close, when they circled out over the sea for a few minutes and then returned each time to almost the same spot on the sands. In the end they all rose and flew leisurely along the sands towards Ballygeary (Rosslare Harbour). This was the only occasion on which I met with the species there, though I had been constantly on the sands all the summer from June to the end of September. Either Common or Arctic Terns were frequent up to the second week in September, but none were about the day I met with the Sandwich Terns.

W. M. Abbott.

Fermoy

Recent Records of Irish Birds.

In "British Birds" for January, 1923, L. J. Turtle records the visit in April last of a Spoonbill to Achill Island; C. V. Stoney reports the finding of a clutch of seven eggs in a Rook's nest in Co. Donegal.

Among Irish bird records of the past two years probably the most important is Mr. C. J. Carroll's detailed account (Brit. Birds, 1921, pp. 209-10) of the evidence collected by himself and Mr. Williams in proof of the breeding in at least two seasons of the Black-necked Grebe in the west of Ireland. In the same volume Mr. Carroll gives "Notes for the seasons 1918-19-20 on the Irish colonies of Sandwich and Roseate Terns discovered in 1917" (vol. xiv., pp. 253-6), and also (p. 215) draws attention to an "Unacceptable Record of the Long-tailed Duck breeding in Ireland." Mr. Witherby, in some "Notes on British Records of the Spotted Eagle" (pp. 180-2) indicates the need for careful examination of the Irish-killed specimen preserved in Trinity College Museum. Lt.-Col. H. A. F. Magrath (vol. xv. p. 154) describes an east-to-west migration observed by him across the Irish Sea during a passage to Holyhead on November 7th, 1921. The question of the "Former Breeding of the Osprey in Ireland," raised by the Rev. F. L. Blathwayt (1922, p. 192), is discussed by H. Kirke Swann (p. 220) and G. R. Humphreys (p. 243). Two occurrences of the American Bittern in October, 1921, are the subject of a note by Mr. Williams (p. 212); Mr. E. G. Hope-Johnstone (p. 272) reports having seen a pair of Black-necked Grebes at Malahide in January and February, 1922; and an account of the "Failure of the Malahide Tern Colony" in June last is given by Lt.-Col. Magrath (vol. xvi., pp. 168-170.

BOTANY.

Colour-Variation in Cowslip and Primrose.

Mr. Miller Christy, who is making detailed studies of some of the British species of Primula, writes me relative to the red-flowered forms of the Cowslip and Primrose. He says that the distribution of these forms is quite peculiar: they are found in the eastern and western parts of the plant's range, but are apparently absent from the whole central portion. Red Primroses, for instance, occur in abundance only in western Britain, France, and Spain on the one hand, and in Greece, Turkey, the Caucasus, &c., on the other. He asks for information about the range of red Primroses and Cowslips in Ireland, concerning which all our Floras are silent, since colour-variation has not usually been considered worthy

of record. He also asks—"*How* do they occur? Are they *sporadic* (a few plants here and there among a much larger number of the normal colouration), or are they *locally abundant* (a large number of plants together in certain special localities)? And, if the latter is the case, what is the *nature* (elevation, soil, &c.) of these localities? Also is there any noticeable increase in the number of such localities *as one proceeds westward*? (Such is the case in Britain, reaching a climax in Cornwall, Pembrokeshire, &c.)." I have been able to give Mr. Christy very little definite information, as, though often found, I never took notes of these forms. Perhaps some of the readers of the *Irish Naturalist* can help.

R. Lloyd Praeger.

Dublin.

Erica stricta in Antrim and Derry.

At a Dublin flower show two years ago I was told by the representative of the Donard Nursery, Newcastle, Co. Down, that they had recently received cuttings of a supposed hybrid heath which had been found near the Sallagh Braes, above Larne. The head of the firm, Mr. Coey, had noticed the heath in a Larne garden, and on enquiry had been told that its origin was as mentioned above. Recently I received a young plant of it from the nursery, by the kindness of Col. Berry, and it turns out to be typical *Erica stricta* Don, a plant of Southern Europe, well known in gardens. I should have been inclined to attribute the record to an error due to a confusion of labelling in the Larne garden were it not that Miss Leebody has sent a specimen of a heath found by her (one clump) at Downhill in Co. Derry last September which, though not so characteristic in growth, Miss Knowles and I agree in referring also to *E. stricta*.

The discovery of a second station for the plant might be held to strengthen greatly the case for its being native here, and, of course, the most remarkable feature in the Irish flora is the occurrence of a number of South European species. But these plants are characteristic of the milder parts of Ireland, not of the North-east, where southern species reach their Irish minimum, and northern species their maximum. Besides we have no evidence at present of the occurrence of more than a single plant in each station, although heaths are mostly distinctly gregarious in their distribution. I think we must look on the plant as an extremely doubtful addition to our flora: it seems to me most probable that some person has been trying his hand at naturalisation—a thing unworthy of any true naturalist, especially if he fails to mitigate his falsification of nature's record by publishing the facts.

R. Lloyd Praeger.

Dublin.

IS THE SQUIRREL A NATIVE OF IRELAND?

BY C. B. MOFFAT, B.A.

As Dr. Scharff and Mr. Le Fanu have recently pointed out in this Journal (vol. xxxi, pp. 51-4 and 83-4), there is now unquestioned proof of Squirrels having inhabited Ireland in historical times, long before the period at which they began to be introduced; and the fact of their having survived and furnished skins for wholesale exportation down to at least the closing years of the 17th century has not unnaturally prompted the question whether they may not in some of the better-wooded parts of the country have continued to hold their own until replantation of demesnes encouraged them once more to spread and become common. The case for this view is briefly stated by Dr. Scharff, where he observes that "in the 18th century there still existed large woods scattered about the country in which a few Squirrels may have survived."

My object in contributing a few words on this subject is not to dispute the possibility of such survival having taken place, but to adduce what I regard as a strong reason for believing that the Squirrels which now inhabit Ireland —or at any rate the eastern part of our island—are descended only from imported animals.

In that part of County Wexford in which most of my own field-studies have been carried on, there still stands a considerable expanse of old natural wood—the remains of the once celebrated Killoughrim Forest—which retains to the present day many of the characteristics of almost undisturbed virgin ground. It differs from the surrounding country not only in the absence of introduced timber, but also in being a home of such local and interesting inmates as the Brown Hairstreak (*Zephyrus betulæ*) and Dingy Skipper (*Thanaos tages*) butterflies, the large Wood Ant (*Formica rufa*), and the great heath-haunting spider (*Epeira quadrata*), none of which are to be found (unless by rare

accident) in any of the other woods with which the neighbourhood is fairly well stocked.

The trees of this old wood are of the species that probably compose nearly all the old natural forests of Ireland—chiefly Oak and Birch, with some Aspens, and a flourishing undergrowth of Hazel, Holly, Blackthorn and Guelder-Rose, with Willow (*Salix cinerea*) and Alder in the damper parts. Ash is almost, though not entirely absent ; the Mountain-Ash turns up here and there, and this probably completes the list. There are, of course, no conifers ; the Beech is also a conspicuous absentee.

Squirrels first made their appearance at Ballyhyland (which is less than a mile distant from Killoughrim) in the summer of 1890, and within a very few years became so abundant that one could scarcely pass through a plantation anywhere in the neighbourhood without seeing or hearing several, while the marks of their feeding were still more constantly in evidence. I remember on one occasion (November 4th, 1901) counting forty in sight together all on the ground, apparently seeking fungi.

There was only one wood in all the surrounding country in which I never saw them ; and that was the old Forest of Killoughrim, of which they steadfastly refused to take possession.

It must be admitted that the forest contained plenty of feeding that might have been thought attractive enough to Squirrels. It was almost the only wood in the neighbourhood in which hazel-nuts were abundant ; acorns were nowhere else to be had in anything like the same quantity, and toadstools of many kinds were as plentiful as Squirrels could wish, while of such minor dainties as berries and oak-galls, readily eaten in most of the other woods, there was no lack. But the absence of Pine, Fir, Larch and Beech would seem to have decided the Squirrels to have absolutely nothing to do with the one bit of real old Irish woodland that presented itself to their choice. Every other grove—almost every bit of timbered ground—had its attractions ; but Killoughrim they would not enter. And yet it is in woods almost identical in character with Killoughrim that the old Irish Squirrels must be presumed

to have maintained their existence (if they did maintain it) from the time when the bulk of our native forests were felled until introduced trees began to be planted.

I think this remarkable boycotting of Killoughrim is almost conclusive evidence that the Squirrels now inhabiting County Wexford are not the descendants of animals whose natural home was in the old Irish woods.

Dublin.

ENTOMOLOGICAL NOTES FROM ROSTREVOR.

BY REV. W. F. JOHNSON, M.A.

I ARRIVED in Rostrevor in the middle of June, 1922, and owing to the exigencies of moving, unpacking and settling down, I was unable to do much at entomology, and the wet summer added to my difficulties. In fact I did very little till August.

I saw the Humming-bird Hawk-moth (*Macroglossa stellatarum*) early in June, first in Warrenpoint and then in Dr. Evans's garden at Kilkeel. I did not see it at Rostrevor. *Hecatera serena* was found sitting on a wall on the roadside in the early evening. I took it at Portnoo, Co. Donegal, in 1918.[1] It does not seem to have been recorded from Co. Down before. I was very pleased to get *Amphipyra pyramidea*, as I had not met with it before, and it is rare in Northern Ireland. Mr. Thos. Greer records it from Co. Tyrone.[2] The specimen I secured is smaller than those I have from Co. Waterford.

Cirrhædia xerampelina I found sitting in my study window, to which it had probably been attracted by light the night before.

Of Coleoptera I have only two species to record, but this is easily accounted for by the fact that I was not looking for them. I was a little surprised to find *Girammoptera ruficornis* on Hogweed. I had met with it at Poyntzpass on Giant Spiraea and on Hawthorn.

Nearly all my captures of Hymenoptera and Diptera

[1] *Irish Naturalist*, xxviii. 19.

[2] *Irish Naturalist*, xxviii. 118.

were made in August and in Victoria Square. The Aculeatar, and indeed the other families also, suffered from the wet season, and I got but few. It was of course too late for most of the Sawflies, but *Allantus arcuatus* was as usual very plentiful and obtrusive, shoving other insects aside on the umbels of Hogweed and Ragweed, and fighting with each other after their amiable manner.

I netted *Sirex gigas* (female) in a street of Rostrevor, as it hovered at the name-board of a shop. The wood was of course the attraction, but I could not help wondering at it wasting its time there when there was so much more suitable timber within easy reach.

Athalia lineolata does not seem to mind what elevation it is at, for I took it at practically sea-level and high up on the mountain-side.

None of the Aculeates were plentiful and I was fortunate in securing a specimen of *Andrena denticulata*, a handsome bee which I had only met with at Coolmore.[1] There were so few suitable days that I got very few Ichneumon Flies. I took a male *Ichneumon sarcitorius* with the apical bands of the abdominal segments nearly as white as those of Swedish specimens kindly sent to me by Dr. A. Roman. I took *I. caloscelis* in my little garden, crawling on the earth. It is a male and much larger than usual, so much so that I supposed it to be *I. primatorius*, but examination showed it to be only this very common species. *Glypta biforeolata* is also much above the usual size, which is given by Morley[2] as 4–6 mm., and by Thomson[3] as $1\frac{3}{4}$–$2\frac{1}{2}$ lines, whereas my specimens are 8–9 mm. I was so puzzled that I sent specimens to Dr. Roman who most kindly examined them and informed me they were a large form of this species.

Unless otherwise stated the locality for my captures is Victoria Square, which at present (and long may it continue so) is a field with houses on two sides, close to my own house and just the place in soil and herbage to attract Hymenoptera.

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[1] *Irish Naturalist*, xxvii. 3.

[2] British Ichneumons, iii, 166. [3] Opuscula Entomologica xiii, 1,342.

LEPIDOPTERA.

Hecatera serena.—July on wall by roadside.
Hydraecia nictitans var. **erythrostigma.**—September, light.
Amphipyra pyramidea.—October, light.
Cirrhaedia xerampelina.—September, in window.
Calocampa exoleta,
Cheimatobia brumata,
Himera pennaria,
} November, light.

COLEOPTERA.

Geotrupes sylvaticus Panz.—July, in wood.
Grammoptera ruficornis F.—August.

DIPTERA.

Sargus bipunctatus Scop.
Melanostoma ambignum, Fallen.
Syrphus ribesii, L.
S. umbellatarum, Fat.
Xanthogramma ornatum Meigen.
Eristalis intricarius, L.
Sericomyia borealis, Fallen.
} August.
Chrysotoxum bicinctum, L.—July.

HYMENOPTERA.

ACULEATA.

Pompilus gibbus, F.
Pemphredon lugubris, Latr.
Passaloecus monilicornis Dhlb.
} August, in study window.
Vespa sylvestris Scop.
Sphecodes niger V. Hag.
Siaffinis V. Hag.
Halictus rubicundus Chr.
H. albipes K.
Andrena denticulata K.
A. saundersella Perkins
} August.
Bombus hortorum L.—Taken in window.

TENTHREDINIDAE.

Sirex gigas L.—In street,
Pachynematus trisignatus Foerst,—Hogweed,
} July.
P. clitellatus Lep.—Hogweed, August.
Athalia lineolata Lep.—On mountain, July; at Hogweed, August.
Allantus arcuatus Foerst.—Hogweed, July, August.
Var. **nitidior** Knw.—August.

ICHNEUMONIDAE.

Ichneumon sarcitorius L.—July, August.
I. latrator F. } July,
I. caloscelis Wesm. } garden.
Spilichneumon occisorius Gr.—September.
Amblyteles armatorius Foerst.—August.
Colpognathus divisus Thoms.—In window, July.
Microcryptus nigrocinctus Gr.—Road to Warrenpoint on grass, September.
Glyphichnemis vagabunda Gr.—July.
G. brevis Gr. }
Goniocryptus titillator L. } August.
Glypta genalis Moll. }
G. biforveolata Gr. }
Lissonota bellator Gr. }
L. variipes Desv., July. } August.
L. variabilis Hlgr. }
Polyclistus mansuetor Gr.—August, September, in window.
Tryphon vulgaris Hlgr.—July.
Polyblastus variitarsus Gr.—September.
Sagaritis punctata Bridg.—The Lodge demesne, July.
Ophion calcaratum Morley } To light in house, October.
Paniscus gracilipes Thoms. }

BRACONIDAE.

Apanteles falcator Nees.—Field, } July.
Microgaster tibialis Nees. }

Rostrevor.

REVIEW.

Memoir and Map of Localities of Minerals of Economic Importance and Metalliferous Mines in Ireland. (Memoirs of the Geological Survey of Ireland). By GRENVILLE A. J. COLE, F.R.S., M.R.I.A. 8vo. pp. 155. Dublin: Stationery Office, 1922. Price 7s. 6d. net.

THIS is a plain unvarnished enumeration and description of all Irish mines, etc., which have produced minerals and metalliferous ores. A mine has been defined somewhere as a hole in the ground, often owned by a liar; and in view of the frequent exaggeration which has been often indulged in concerning Irish mineral resources, whether prompted by enthusiasm, ignorance or cupidity, this judicial treatment of the subject considerably enhances the value of the work. A chapter is devoted to each of the more important minerals, arranged alphabetically, and under each mineral the mines or quarries where it has been at any time obtained are set down with much historical detail, commencing in the case of gold with a reference

which dates back to 1436. The literature of the subject has been consulted very fully, and authority is given for all quoted statements. In addition, geological and mineralogical information is added as required to make the matters dealt with comprehensible to the layman, and references to the Ordnance Maps make it easy to locate places dealt with. A short Introduction deals with the progress and knowledge of Irish mines and minerals from early times to the present.

A large map, excellently printed as regards detail, accompanies the Memoir. On it the areas covered by bog, whether mountain or low-level, are coloured in pale red, giving a very marked character to the map. The few coal areas are shaded black, and the various mines are shown by bright red dots, followed by their name and an indication by chemical signs of the nature of the minerals which they yield. All railways and canals are also clearly shown.

Now when the development of Irish industries is coming so much to the fore, this Memoir and Map should be invaluable as indicating both the possibilities and limitations of our mineral resources.

R. Ll. P.

NOTES,

BOTANY.

A Hybrid Sedge new to Co. Dublin.

Owing to the prevalence of the two sedges *Carex flava* and *C. Hornschuchiana* in Glenasmole I have frequently looked for their hybrid, known as *C. xanthocarpa* Degl., but unsuccessfully. In June, 1922, however, I found a nice patch growing with both the parents in the meadow between the steam-tram line and the S.E. corner of the lower Brittas pond. When dried *C. xanthocarpa* is very like a starved specimen of *C. Hornschuchiana*, but Miss Knowles, who has verified my specimen, pointed out that the female spikelets are pointed in the former and blunt in the latter. In the field, on the other hand, *C. xanthocarpa* had all the appearance of a hybrid, differing completely in its general colouring from *C. Hornschuchiana*, and in its taller spikes and more distant spikelets from *C. flava*. As in other hybrid sedges the fruits were all abortive: one which looked to contain a mature seed was found to shelter instead a small insect larva.

A. W. Stelfox.

Rathgar, Dublin.

ZOOLOGY.

Raven in Co. Wexford.

About three months ago two birds made their appearance on the sand-hills here at the mouth of the harbour. The writer's attention was first attracted by the "croak" which they uttered, which is quite unlike the cry of the Hoodie, a very common bird here. Further observation showed them to be Ravens. They are very shy and wary, but their large size and "social aloofness" are very noticeable. When flying in a wind they seem to let themselves go with an abandon quite unlike their ordinary mode of progression and are then a delight to watch. Just before sunset they fly inland, but I have no idea how far their roosting-place lies from their daily beat.

LESLIE HUGGARD.

Wexford.

Migration of Swallows in South-east Wexford.

The following observations were made last autumn on a part of the coast of south-east Wexford extending from Blackwater Harbour on the north to Ballytrent, about half way between Greenore and Carnsore Points, on the south.

I spent August 19 and 20 at Curracloe, a small place on the coast, north of Wexford Harbour. On both days I found parties of Swallows, ranging from about 20 to 50 birds in each, flying steadily along in a southerly direction. These parties were not closely packed, that is to say the individuals were scattered, but each party was well defined and an interval, sometimes of only a few minutes, but generally somewhat longer, lapsed between the parties. All these birds flew along the shore, between the cliffs or sandhills, as the case might be, and the tide-line; a few occasionally being just beyond the latter. When I climbed the cliffs the stream of birds was passing below me and I could see the local birds flying around as usual inland. Indeed I watched several of the parties pass through a colony of Sand-Martins, whose nesting holes were visible in the cliff-face, but neither seemed to pay any attention to the other. It must be understood that this was not a continuous, but rather an intermittent, stream of birds. On the 19th inst. it was in full swing at 5 p.m. (summer time) when I arrived on the shore, but ceased about an hour and a half later. On the following day it commenced about 11 a.m., and I saw no migrating birds after 3 p.m., but between those hours the passage of parties was constant. I noticed also that longer intervals elapsed between the parties at the commencement and nearing the termination of the flight, so that the stream was at its greatest density from about 12.30 to 1.30 p.m. On perhaps half a dozen occasions I saw birds drop on the sand to rest, and when this occurred the birds following on would swoop down close to their tired companions, at the same time twittering gently as if to encourage them. After resting a few seconds

the birds would rise and follow their mates. I was rather surprised to find such numbers migrating at this early date, but I see (*British Birds*, xvi. p. 134) that Dr. N. H. Joy had a somewhat similar experience earlier in the month at Selsey Bill.

Exactly a month later, on September 20, I was at Ballygeary (Rosslare Harbour) and at noon started to walk along the shore towards Greenore Point. I at once noticed parties of Swallows, passing along between the cliffs and the tide-line, but now they were going *north*. About a quarter of a mile south-east of the pier, I found the stream, which was now continuous and not intermittent, coming from inland and striking the coast at an acute angle. I climbed the cliff at that point and found the birds coming overland from about south-south-west. For about fifteen or twenty minutes the air was alive with birds and over the land the stream, about 20 yards wide, was just as well defined as when the birds were flying along the shore. At this time, about 1 p.m., the stream was at its greatest density and was continuous, but then it began to be divided up into distinct parties and gradually died off about 2.30 p.m., after which I saw no birds coming up from the south. Up to 1.30 p.m. all birds were going north, but then I noticed a few birds coming along, outside the main stream and going south. These were the van of a new stream flying from north to south, and for about half an hour I watched the two streams passing one another along the shore. This new stream, however, never attained the same dimensions as the northward-bound one, and instead of turning inland where the other was emerging, it continued along shore, so after a time I followed it up and found the birds gathering at Greenore Point. On the north side of this point the birds were flying around in more or less circles, and kept on increasing in numbers, but when I turned the point to the southward not a bird was visible. After a time I noticed some birds, but still comparatively few, launching themselves off over the sea in the direction of, but slightly north of the Tuskar. A few of these birds, when a little way out to sea, returned to land, but the others kept on out of sight. Having watched them for some time and seeing no sign of an immediate departure, for the birds that did go only formed a very small percentage of those flying about, I decided to walk on to Ballytrent to see if I could find any birds along that part of the coast, but I did not see a single Swallow the whole way. So I returned to Greenore Point and found to my great disappointment that all the birds had gone during my absence, not a single Swallow to be seen anywhere, nor did I see any further movement of birds that evening, but there were a few "locals" flying around in Ballygeary later. Of course I cannot say definitely that these birds, numbering several hundreds when I left Greenore, set out on their cross-channel journey from that point, as I did not actually see them go, though I did see some. They may have gone north again, but they certainly did not come south, and I think it is a fair inference to make that they used Greenore Point that afternoon as a "jumping off" place, and they must have left it between 3.15 p.m. and 4 p.m. On September 28, I walked from Rosslare Strand to Ballygeary along the shore. Most of the way I saw no Swallows, but when nearing the latter

place, small parties suddenly appeared, flying north, the flight as usual being between the cliffs and the tide-line. These parties continued to pass, and when I got to Ballygeary I went to the point where I had seen the birds strike the coast on the 20th inst. and again the flight came up overland to that point from practically the same direction. On this occasion the stream was always intermittent and consisted of Swallows, House-Martins, and a few Sand-Martins, but the numbers were nothing like those seen a week earlier. I found no birds between that point and Greenore, nor did I see a return flight from the north that evening.

I have records of both Swallows and House-Martins in some numbers about Wexford town, up to and including the 30th October. In two sheltered valleys close to the town I found them almost every day that month, but saw none after the date mentioned.

W. M. Abbott.

Fermoy.

Some of our readers may remember that two very interesting articles on the autumnal movement of Swallows on the same part of the Irish coast were contributed to this journal in 1912, by Mr. A. H. Delap (vol. xxi., pp. 65-71) and Mr. H. F Witherby (pp. 143-4). The three sets of observations should be read together and carefully compared.

—Eds.

The Macrolepidoptera of County Tyrone.[1]

Mr. Greer is to be congratulated on the completion of his local list of Tyrone Lepidoptera; it is undoubtedly the most interesting report of this kind that has appeared since the publication of Mr. Wm. de Vismes Kane's "Catalogue of the Lepidoptera of Ireland" more than twenty years ago. When Mr. Greer began the study of Tyrone Lepidoptera the county had been but little explored. Mr. Kane had collected in the old Favour Royal demesne and at Altadiawan Glen on the slope of Slieve Beagh in the southern part of the county. Mr. Greer also acknowledges the valuable results of Professor J. W. Heslop Harrison's holiday visits to the district in the seasons of 1909 and 1910. The present list includes records of 331 species, as well as many varieties, and about 90 are not recorded from Tyrone in Mr. Kane's "Catalogue." A pleasing feature is the large number of interesting notes concerning the actual occurrence of the species, accompanied in many cases by notes on their larvæ, evidence of painstaking field-work carried out during many years in various parts of the county.

The butterflies number twenty-two species; amongst the more interesting are *Vanessa io* "abundant of late in the district"; *Euvanessa antiopa* once seen near Trillick, as mentioned by Kane, and one in a collection taken near Cookstown in August, 1904; needless to say it is

[1] "The Entomologist," Vol. liii., October and December, 1920, and Vol. liv., February, May, September, November and December, 1921.

not a native species. *Dryas paphia*: in Mr. Greer's district the larva feeds on *Rubus Idæus* and not on its usual food-plant *Viola canina*; a variety of this butterfly with greenish-white spots on the wings occurs in one of the glens where the typical form is abundant. A few of the rarer moths may be referred to—*Pheosia tremula*, larva locally abundant on poplars. *Pterostoma palpina*, rare. *Polyploca flavicornis*, *Dasychira fascelina* and *Acronycta leporina*; the larvæ of these three occurred on the Lough Neagh border. *Diaphora mendica* var. *rustica* common, the males ranging from white, through buff, to a pale smoke colour, the female often with only the dot at base of fore wings. *Demas coryli* locally abundant. *Agrotis corticea* and *Agrotis cinerea* at light. *Eumichtis protea*, a single specimen at sugar. *Panolis piniperda*, not very abundant. *Tæniocampa opima*, at Lough Neagh, where the variety *brunnea* occurs. *Dyschorista suspecta*, locally common at heather blossom and on ragweed. *Cirrhœdia xerampelina*, at rest on ash trunks and at street lamps. *Amathes helvola*, very rare at sugar. *Geometra vernaria*, in some numbers near Coalisland and probably introduced with *Clematis Vitalba* which is common in gardens in the same locality. *Chesias spartiata* common among broom (*Cytisus scoparius*). *Eucosmia undulata*. *Eurymene dolobraria* very local, larva on hazel and beech. *Pachys strataria*, one at rest on sallow trunk, and another bred from a larva beaten from wild cherry in April. The larva of the common *Abraxa grossulariata* in certain localities feeds on ling, the imago is small and dark.

Evidently Mr. Greer believes there is still useful work to be done on the lepidopterous fauna of Tyrone. He remarks "a large area in the centre of the county, consisting of wide moorlands, studded with numerous lakes; fertile valleys, many glens clothed with native scrubby woods, dominated by the isolated mountain Mullaghcarn, 1,778 feet in elevation; and in the north a mountain range rising to over 2,000 feet, is all practically unknown so far as the Lepidoptera are concerned". So we may look forward to further discoveries in this interesting district.

J. N. H.

Dublin.

Early Breeding of Wood Pigeons.

A neighbour of mine informed me a day or two ago that on the morning of the 6th February following a gale of wind, he found under a tree near his house, two young pigeons which had evidently been blown out of their nest. He described these young birds as being nearly ready to fly, and on the day of disaster and the following the youngsters were fed on the ground by their parents. Unfortunately a dog terminated their earthly career. From the description given to me, these young birds must have been hatched about the middle of January, and this surely constitutes a record even for a Wood Pigeon.

R. J. Pack-Beresford.

Auburn House, Athlone.

An Enemy of the Wireworm.

In the August number of "The Entomologist," 1922, pp. 185-6, Mr. Claude Morley, F.E.S., records the parasitism of the wireworm (Agriotes sp. ?) by the Hymenopteron *Paracodrus apterogynus* Haliday. His statement is as follows :—"Nothing has hitherto appeared respecting its economy. The Irish National Museum in the autumn of 1919 sent me an apterous female of this species for determination, with the intimation that it had recently been bred along with identical specimens from a larva of the Coleopterous genus Agriotes, found at Bangor, in Devon "(sic).

As the finder of the larva I think it may be as well to record the whole facts. On several occasions in the years 1915-19 I found in my garden at Ballymagee, Bangor, Co. Down (not Devon) wireworms from which protruded the pupae of a parasite. In 1918 my curiosity was sufficiently aroused to send one to Mr. J. A. Sidney Stendall of the museum at Belfast. The insects hatched out but escaped; but in the following year Mr. Stendall was successful in rearing three or four females from another wireworm which I had sent him. These eventually reached Mr. Morley, through Mr. J. N. Halbert, and were named as above. Paracodrus is a genus belonging to the Proctotrypidæ, a division of the Hymenoptera.

In the National Museum are two specimens of wireworm from Valencia, Co. Kerry, sent by Miss Delap, some years ago. From one protrude many pupae, from the other numerous "still born" imagines of what appear to me to be the same species of Paracodrus referred to above. So far as I can see, all are wingless and all are females. Mr. Morley (*loc. cit.*) states that the female is sometimes winged like the male, and adds that the latter is by far the rarer sex. Mr. Morley also quotes three old records in which wireworms had been found parasitised by "a Proctotrypes," a generic name which in those days included Paracodrus.

The question arises, how does the female Paracodrus gain access to the wireworm (which is, of course, the larva of one of the so-called Click Beetles) ?

Wireworms are often found at a considerable depth in the soil and are most common in old grass-land; but I have often found them in my garden at Ballymagee, basking, as it were, in the sun, just below the surface of the soil, when the latter was very finely worked, as in a seed or onion bed. A rake drawn over the surface of such a bed would expose sometimes as many as five or six surprised and struggling wireworms. This only occurred in very hot dry weather, and possibly it is under such conditions that the female Paracodrus carries out her egg-laying. *Paracodrus apterogynus* is about a quarter of an inch in length from tip of the long antennae to apex of the abdomen, exceedingly slender, blackish-brown with paler legs and antennæ; the whole head and body are very glossy and the head is curiously spherical.

A. W. Stelfox.

National Museum.

POROTRICHUM ANGUSTIFOLIUM IN IRELAND.

BY H. N. DIXON, F.L.S.

Porotrichum angustifolium Dixon (*Thamnium angustifolium* Holt) is one of the few mosses with a genuine claim to be endemic in the British Isles. Its characters are marked and well defined; while the fact that it grows intermixed with *P. alopecurum*, each keeping its own characters, precludes any idea of its being a form due to local conditions. And more than that, it has hitherto been known from one sole station in Derbyshire, where it is indeed confined to a single and rather limited rock-surface.

It is therefore of special interest that it appears to be also an Irish plant. Two records have come under my notice, which must be dealt with separately.

1. It is recorded by the late Canon Lett from Co. Kerry in his "Census Report on the Mosses of Ireland" (Proc. Roy. Irish Acad. xxxii., 162 (1915). The record reads "2 Derrycunnihy 1906—H. W. L."

Unhappily the record is incorrect. I have been allowed, by the courtesy of the Acting Director, to examine the specimen of the original plant collected by Lett, in the National Museum at Dublin. There is only one specimen. It is a form of *P. alopecurum*, slightly different from the normal forms; one peculiar to rocky sides and boulders of mountain streams; growing in similar situations to, and not unlike *Eurhynchium myosuroides* var. *rivulare* Holt.

2. The second record rests on a much firmer basis, the information for which I owe to Mr. H. C. Broome. Mr. Broome has in his possession the herbarium of the late Mr. Levi Tetlow, an ardent Lancashire naturalist, and a keen moss collector. Among the mosses in the collection are two from Ireland, both labelled in Tetlow's hand as being collected by Jas. Shepley (of Oldham) in Ireland, in 1898. One is labelled "*Dicranum undulatum*, Glenariff, Ireland, 1898 c[oll.] J. Shepley." This, however, is not *D. undulatum*, but a very rugose-leaved form of *D. Bonjeani* referable probably to var. *rugifolium* Boswell.

The other is labelled "*Porotrichum angustifolium* Dixon, Glen——, Ireland, 1898 c[oll.] J. Shepley." Most unfortunately the name of the locality is illegible, which may be due to Tetlow's hand, or possibly to his having been unable to decipher Shepley's writing. It looks like Glenlive. Mr. Broome suggests Glenaline (a mountain in Fermanagh) as being the nearest to the word as written. But I must confess to a difficulty in accepting this solution. The word *might* be Glenaline, but I think it might quite as well be something else ; and there is no reason whatever to suppose that Shepley was ever in Fermanagh. The fact that these two mosses are, as I understand, the only two Irish specimens of Shepley's collecting in the herbarium, and both collected at the same date, suggests very strongly that they were both collected somewhere at least in the same district, *i.e.*, near Glenariff, in Antrim. Glenarm, Glendun and Glenaan are the only names of this type with which I am acquainted in that neighbourhood, and none of these fits the script. It is possible that it may be a name of only local importance, but I am inclined to think that the word as written may quite probably be considerably altered from the original, whatever it was.

The plant is perfectly correct ; there is only a single stem, but it is in quite good condition, and characteristic. It occurred to me as a possibility that the specimen might be a Derbyshire one given to Tetlow by Whitehead, and attributed to Shepley by an error ; but Mr. Broome thinks this most improbable ; there are no other specimens of the Derbyshire plant in Tetlow's collection from which it might have been taken ; and there is every evidence of care in the herbarium of labelling, &c. I may add to this that the habit of Shepley's plant is slightly different from any of the gatherings I have seen from Derbyshire, being in fact somewhat better developed and more dendroid in habit, with a firmer main stem.

All things considered, I think the evidence is strongly in favour of an Irish origin for the specimen ; probably in Antrim in the neighbourhood of Glenariff. The Derbyshire station is a distinctly calcareous one, but as *P. alopecurum* is found on both calcareous and non-calcareous rocks, it

must not be too hastily assumed that *P. angustifolium* is a purely calciphilous moss.

Any information or suggestion as to the possible name that is hidden under the dubious "Glenlive" would be very welcome, while a search for the moss in the neighbourhood of Glenariff would be highly desirable. It should be looked for on rocks that are, at times at least, moist, and has the appearance of a slender, small-leaved form of *P. alopecurum*. The narrow branch-leaves with very broad nerve would enable it to be recognized with the lens.

Northampton.

REVIEW.

The Elasmobranch Fishes. By J. Frank Daniel. Berkeley, California; University of California Press, 1922. Pp. 334, with 260 plates and figures. Price, cloth $5.50.

The term "elasmobranch" is applied to those fishes whose gills are plate-like in structure and whose skeleton is cartilaginous. All the sharks, dog-fishes and their relations, the skates and rays belong to this group. The author, who is Professor of Zoology in the University of California, justly dwells on the importance of the elasmobranch fishes for the study of the fundamental plan of the vertebrate body. For many years past the Common Dog-fish (*Scyllium catulus*) which is a species of the shark tribe, has been carefully examined and dissected by students undergoing a course of zoology in British universities and colleges. This practice does not seem to be carried out to the same extent in the United States, and Prof. Daniel endeavours by the publication of this book to rouse a more general interest in the study of elasmobranch fishes.

There can be no doubt about their being a very primitive group of fishes. Comparatively few species are still living. But in bygone ages there existed many more, and some of them attained gigantic proportions. Many of the extinct forms are only known from their teeth which have been preserved to us in various geological deposits.

One of the most interesting types of Elasmobranchs is Heptanchus, a shark possessing no less than seven gill-slits and the same number of gill-arches. Together with Hexanchus, to which it is very closely related and which occurs in Irish waters, it has often been placed in the genus Notidanus. It is this genus Heptanchus which, on account of its special generalization, has been chosen by Prof. Daniel as a type with which to compare in general other elasmobranch fishes. It inherits more than any other shark the main features of its remote ancestors. The author has also collected and combined the work done by many investigators on the various types.

The treatment of the subject chosen by Prof. Daniel has been carried out with great care and success. The eleven chapters dealing with the external characters and the internal structure are copiously illustrated, many of the drawings being original. Special attention may be directed to the chapters on the arterial and venous blood systems for the wealth and beauty of the illustrations. And what will assist the student considerably is that at the end of each chapter there is an exhaustive bibliography. To both students and teachers this book will be of the greatest use as a valuable guide on the structure of Elasmobranchs, and it can be warmly recommended.

R. F. S.

OBITUARY.

WILLIAM H. PHILLIPS.

W. H. Phillips was born in 1830, and died at Holywood, Co. Down, on 13th March last, in his 93rd year. For over half a century he was an enthusiastic student and collector of British ferns, and particularly of the numerous sports which form so remarkable a feature of these plants. When the writer first met him over forty years ago, he was already in the forefront of the band of workers who in 1891 formed themselves into the British Pteridological Society—which had been preceded, I believe, by another society of similar name. His collection of ferns at Holywood was large and very interesting, and was enriched with not a few remarkable forms which he himself had found in many years' collecting, mainly in Ulster. He was an original member of the Belfast Naturalists' Field Club, founded in 1863, and read his first paper " The Classification and Distribution of Ferns, with notices of some interesting varieties lately found in this locality," before that society on March 23, 1865. He was Treasurer of the Club for twenty-five years, and its President during the sessions 1905-6 and 1906-7, and his fine displays of living and dried fronds of his favourite plants were a feature of the Annual Conversaziones.

In 1887, in conjunction with the present writer, he published as an Appendix to the Club Proceedings " The Ferns of Ulster," in which a full account of the distribution of the species, varieties, and sports of the local species is given.

R. LL. P.

IRISH SOCIETIES.

Ulster Society for the Protection of Birds.

FEBRUARY 16.—Annual Meeting. Sir Robert Kennedy in the chair. The Annual Report stated that the membership of the Society was now about 170. A junior branch of the Society was being formed. Reference was made to the great destruction of sea-birds by oil discharged by vessels entering or leaving the Clyde. The Honorary Scientific Secretaries (N. H. Foster and J. A. S. Stendall) also submitted their report and the Treasurer, Miss Meta McCullagh, her financial statement.

BELFAST NATURALISTS' FIELD CLUB.

FEBRUARY 20.—S. A. BENNETT, B.Sc., and R. BELL, F. Min. Soc., read a paper on a lately discovered prehistoric site on the eastern slope of the Black Mountain near Belfast, at about 800 feet elevation. A large variety of flint flakes, with half-finished implements were found here; finished implements were rarer. The finds included scrapers, hammer-stones, cores, and a leaf-shaped implement which Mr. Reginald Smith considered to be of Proto-Solutrian type.

APRIL 13 (Diamond Jubilee Year).—The annual conversazione was held in the Carlton Hall, Rev. W. R. Megaw, B.A., Newtownbreda, President, being in the chair. An interesting exhibition of specimens was on view. The most important exhibit was that of R. Bell, who showed a series of very early types of worked flints from taluses of pre-historic rock-shelters on the Black Mountain. The flints are similar to some discovered in the Dordogne valley in France, and Grimes' Graves in East Anglia. From the Public Museum came enlarged models of insectivorous plants, showing how these are adapted to capture insects. Specimens of *Bulimus oblongus*, a large land-shell from Trinidad, with enormous white eggs, almost as big as the eggs of a pigeon, were also shown. Among W. A. S. Stendall's exhibits were eggs of the Common Guillemot, Ringed Plovers' eggs, an almost white Sparrow from Ballymena, the first egg of the Fulmar ever taken in County Antrim, and a Little Auk blown ashore at Rathlin Island. James Orr showed a series of exotic cowrie shells. H. T. Malcomson had thirty-five different species of the moths of Northern Ireland. Among the many exhibits of T. Edens Osborne were Ushabti models of servants of deceased Egyptian notables of the time of the Pharaohs. He also exhibited specimens from Scrabo Hill of rain-pitted and ripple-marked Triassic sandstones. A. A. Campbell showed a copy of the Belfast Mercantile Register of 1822, and a "News-Letter" of 1804, as well as albums of excursion snapshots. R. J. Welch had selected fresh-water mollusca from the Lagan valley and Lough Neagh basin, with some xerophile or sun-loving species, including those whose sudden appearance after a rain shower in dry weather, gives rise to the idea in south and east England that it has rained snails. Rev. W. R. Megaw exhibited mosses; Miss Blackwood, Yorkshire plants; S. A. Bennett (Campbell College) had brought Carices of Down and Antrim; Captain Chase, plants from England, which are rare, if not altogether absent from Ireland. A melancholy interest attached to Miss N. Carrothers' group of plants from Magilligan. These had been collected by the late W. J. C. Tomlinson. From the Botanical Department, Queen's University, Professor Small had sent his American life plant, and exhibits illustrating a new aid to propagation by cuttings. Miss M. J. Lynn, M.Sc., collaborated. There were also variations in leaf form of Hornbeam leaves, a tree which, it appears, is found near Belfast. Miss M. W. Rea, M.Sc., showed Rosa (group Canina) from the collection of Rev. C. H. Waddell. W. A. Green—Carboniferous fossil shells and plants, including some very perfect fossil ferns. A. M'I. Cleland—Specimens from

a calcareous deposit, and fossils from Greensand, Magheramorne; also examples of three species of Pholas, from Cloghan Point. After tea Rev. W. R. Megaw, President, expressed his pleasure at the continued progress of the Society, now in its diamond jubilee year. Fourteen new members were elected. Prizes were awarded to two Junior Section Members—Maurice R. Crawford for his collection of dried plants, and to Nora Stendall for a large exhibit of freshly-collected spring flowers.

DUBLIN MICROSCOPICAL CLUB.

MARCH 14.—Dr. P. A. MURPHY announced the discovery of a potato resistant to Pink Rot (*Phytophthora erythroseptica*), and exhibited microscopical preparations and specimens illustrating the resistance of this potato, which belongs to the "Shamrock" variety, in comparison with other well-known sorts.

D. McARDLE showed *Diphyscium foliosum*, a curious moss which shows little trace of a stem furnished with root-hairs. The mature fruit is rarely if ever found in this country, and is described by Schimper as large as a grain of wheat, and he alone seems to have described the rudimentary teeth of the peristome. All our specimens, when collected on a bank by the roadside at Connor Hill, near Dingle, Co. Kerry, bore apparently unfertilised capsules; probably the diœcious character may account for this.

NOTES.

ZOOLOGY.

The Squirrel in Ireland.

Are we not told in the *Táin Bó Cuailnge* that a squirrel and a pet hind were slain by Cuchulain as they sat on Maev's shoulder; and is this not conclusive evidence that the squirrel is indigenous?

Belfast. EDWARD A. ARMSTRONG.

The matter is not quite so simple as would appear from our correspondent's suggestion, on account of the difficulty of determining the correct translation of the Irish word used for the animal which figures in the episode. Dr. Best has kindly furnished the following note:—

> "The word rendered 'Squirrel' in the passage cited from *Táin Bó Cuailnge* is *togmall*, diminutive *togmallán*, and *togán*. It occurs also in the *Acallam na Senórach*, edited by Whitley Stokes (Irische Texte IV. i.) who in his Glossarial Index (p. 431) remarks 'some small animal, guessed by O'Curry to be a squirrel . . .' Windisch in a note to the passage in his edition of *Táin Bó Cuailnge* (p. 180) remarks that the name of this animal varies in the MSS. between *togmall*, *togmallán*, and *togán*, as given above. *Togan* appears to be the more frequent. He compares *taghan* 'the Marten,' citing Macbain, Etymological Dictionary of the Gaelic Language, and translates accordingly 'Frettchen,' *i.e.*, Marten or Ferret."

It will be seen that the identity of the animal in question is more or less guesswork, and that Marten is the more likely translation. In this connection Dr. Scharff's paper "On the Irish Names of Animals (*Irish Naturalist*, vol. xxiv. (1915) pp.45-53, is our best authority.—EDS.

Irish Breeding Birds.

To the April number of "British Birds" Mr. C. V. Stoney contributes an important article—"Recent Observations on some Irish Breeding Birds"—giving in a collected form the additions that have been made since the publication of Messrs. Ussher and Warren's "Birds of Ireland" to the list of birds known to breed in this country, and to the counties in which nests of the scarcer species have been found. The paper will be convenient for reference, as the birds added to our list since 1900 are no fewer than five—the Eider Duck, Common Scoter, Red-necked Phalarope, Black-necked or Eared Grebe, and Fulmar; while in at least six cases counties have been added to the ascertained breeding range, the Garden-Warbler's nest having been found in Queen's County; the Wood-Warbler's in Co. Wicklow (where, however, the fact of the bird's breeding had previously been accepted as quite beyond doubt); the Tree-Sparrow's in Mayo, Donegal, Derry, and Antrim; the Siskin's in Derry; the Crossbill's in Dublin, and the Dunlin's in Fermanagh. The list is admittedly not quite exhaustive, as the writer has refrained in regard to such rare species as the Sandwich and Roseate Tern from naming the counties in which new nesting localities have been found.

Early Arrival of the Chiffchaff in Co. Down.

On 22nd March this year a Chiffchaff (*Phyllosocopus collybita* Vieill.) was seen by me near McAuley's Lake, a large sheet of water about three miles from Ballynahinch, and almost in the centre of Co. Down. The bird was hopping about in a thorn hedge, and its well-known notes, uttered very faintly, were what first attracted my attention. As I watched, its voice seemed to increase in strength. The day was bright and sunny, and the place a sheltered one.

ROBERT N. MORRISON.

Ballynahinch, Co. Down.

Rev. R. N. Morrison's note *supra* constitutes, so far as I know, the earliest record of the Chiffchaff in the North of Ireland. Thompson (*Nat. Hist. of Ireland*, Vol. I., p. 196) gives 3rd April as the earliest date of arrival known to him, and my Hillsborough earliest note is 23rd March, in 1918. This year I saw it first on 28th March.

NEVIN H. FOSTER.

Hillsborough, Co. Down.

Variation in Size of Eggs of the Lesser Tern.

While the eggs of the Lesser Tern vary considerably in ground colour and markings, and sometimes in shape, I have rarely noticed a very great difference in size. The dimensions usually range from 1.2″ x .87″ to 1.3″ x 1.0″. In June, 1921, I obtained specimens from a nest in Co. Dublin, which measured, respectively, 1.05″ x .75″ and .95″ x .75″. The abnormal sizes of these eggs at first made me doubt if the nest did belong to the Lesser Tern. However, the general appearance of the eggs, together with the situation of the nest, and last but not least the kind help of Mr. C. B. Moffat in identification have led me to the conclusion that they were laid by none other than our delightful little summer visitor the Lesser Tern. It would be interesting to know if any readers of the *Irish Naturalist* have ever observed any Terns' eggs so small as these.

F. W. Jeffers.

Dublin.

BOTANY.

Early Flowers.

Owing to the exceptionally mild winter several plants have been flowering in this neighbourhood months before their normal time. On 16th December I saw Primroses in a sheltered lane—apparently in flower for at least a week—and the Lesser Celandine a few days later. Between the 1st and 4th January I found no less than twenty-six species in bloom; the majority were of course survivals, but the following were of fresh growth :— *Cardamine hirsuta, Capsella Bursa-pastoris, Geranium Robertianum, Potentilla Fragariastrum, Geum urbanum, Sanicula europæa, Lapsana communis, Crepis virens, Veronica agrestis.*

C. J. Lilly.

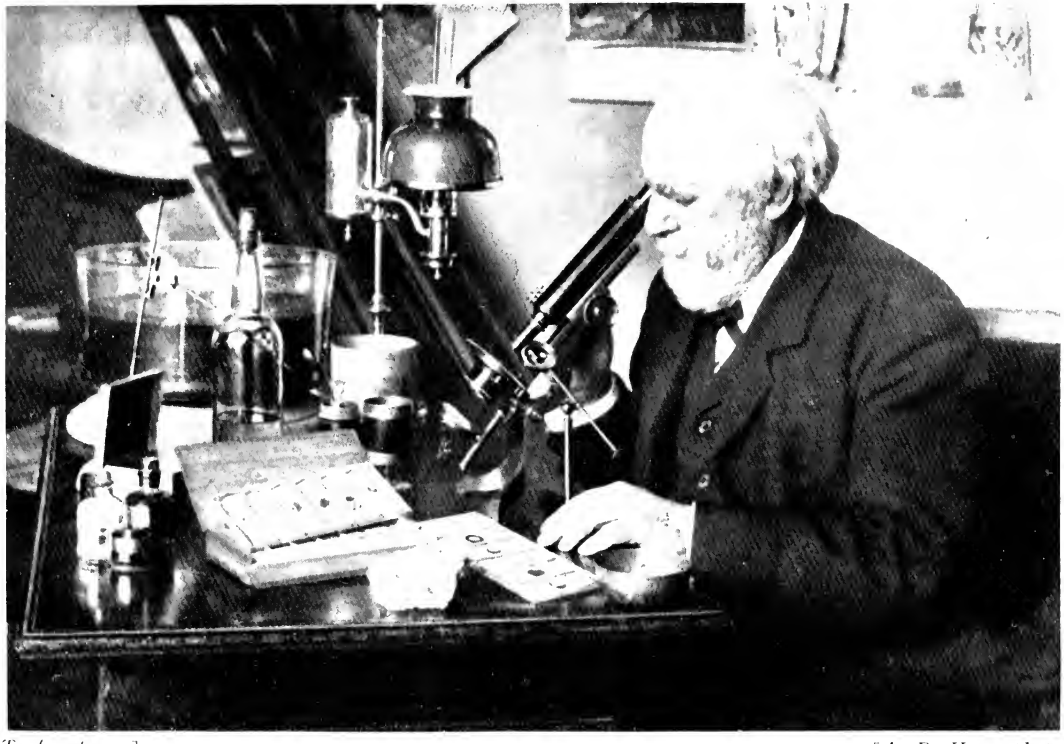
Limavady.

On March 31, along the County Down shore of Belfast Lough, I saw Wild Hyacinth (*Endymion nutans*) in flower in two places—this is quite the earliest date I have for it. To show how mixed the flowering times are this spring, I may add that at the same time and place Blackthorn (*Prunus spinosa*), usually about six weeks earlier, was still largely in bud, and a fortnight later, at Dundalk, near sea-level, Marsh Marigold (*Caltha palustris*) another March flower, was just at its best.

R. Lloyd Praeger.

Dublin.

Mr. D. C. Campbell sends a list of forty-nine species seen in flower about Castlerock, in Co. Derry, at end of November. These are largely flowers of the preceding summer still lingering on.



To face p. 53.]

[*A. R. Hogg, photo.*

JOSEPH WRIGHT, F.G.S.

JOSEPH WRIGHT.

JOSEPH WRIGHT was born in Cork on 7 January, 1834, and died in Belfast on 7 April, 1923, in his ninetieth year. He was the youngest of a family of seventeen, his parents being Thomas Wright, a well-known merchant of Cork, and Mary Dudley, both members of the Society of Friends. Family tradition asserted that the Wrights, a Yorkshire family, came from Saffron Walden to Co. Wexford in the time of Cromwell. He received his education at the Friends' School, Newtown, Co. Waterford, and early developed an interest in geology, being first attracted thereto by the conspicuous fossils of the Carboniferous Limestone, which occupies the trough in which the city of Cork is situated ; it was largely through his subsequent work on these rocks that Little Island became famous as a hunting-ground for the fossils of this formation. His first published contribution to science was a brief paper, " Description of a new Palæchinus,"[1] read before the Royal Geological Society of Ireland, on 9 March, 1864. During his residence in Cork, though closely engaged in business, he devoted most of his leisure time to the search for Carboniferous Limestone fossils, and amassed a very valuable collection, used in subsequent monographs by other workers ; the collection itself now forms part of the extensive and valuable material preserved in the British Museum.

In 1859-60 Joseph Wright was resident in Trinity College, Dublin, assisting the Professor of Geology ; but if he had any schemes for adopting science as a profession, they did not mature. In 1867 he came from Cork to Belfast, where he joined Mr. Malcolmson in establishing the " Overland Tea House." A year later he married Mary Ann Banks, of Cork, by whom he had four daughters. In Belfast he spent the rest of his long life. This neighbourhood offers a remarkably varied field for the geologist, and Joseph Wright soon found fresh palæontological interests. The Chalk of northern Ireland is so hard that it is impossible to separate out the shells of the minute organisms which form a large

[1] Journ. R. Geol. Soc. of Ireland, I., pp. 62-63

proportion of the rock, as can be done with the English Chalk. Mr. Wright discovered that the white material in the interior of the flints of the Chalk is less resistant, and from this new source he worked out an extensive Chalk fauna hitherto unknown, laying the first fruits of his researches before the British Association at their meeting in Belfast in 1874.[2] He now definitely took up the study of the Foraminifera as his life work, and until failing eyesight compelled him to abandon research at about the age of eighty he never swerved from this allegiance. Both fossil and recent material occupied his attention, at first mainly Irish, but in later years from many parts of the world. Having explored the local Cretaceous rocks, he passed on to the Lias, and to a study of sponge spicules from the chert of the Carboniferous Limestone of Ben Bulben. Then he turned to more recent deposits, and made extensive researches into the microzoa of the Glacial and Post-glacial beds of the North of Ireland.

Meanwhile, in 1881, under a grant of money from the Royal Irish Academy, in company with F. P. Balkwill, dredging for Foraminifera in the Dublin area had been commenced, with excellent results.[3] Other dredgings followed, and when, in 1885, on the inspiration of W. S. Green and Prof. Haddon, the Royal Irish Academy undertook the exploration of the deeper waters off the west coast of Ireland, Wright's services were immediately enlisted. The writer had the privilege of serving as one of the scientific staff on the third of these expeditions, held in 1888, when attention was concentrated on the fauna of the 1,000-fathom line and beyond. On that occasion, as on others, Wright's cheery optimism, his ready adaptability to the rough life on a tug-boat in deep water, and his enthusiasm over the difficult work of dredging in such depths were only excelled by the leader himself, W. S. Green.

In later years he was called on to report on the Foraminifera of various extra-Irish deposits. He did much

[2] B.A. Report, 1874 Sectoins, pp. 95-96.

[3] F. P. Balkwill and J. Wright: Recent Foraminifera of Dublin and Wicklow. Proc. R. I. Acad. (Science), 2nd ser., III., pp. 545-550 (1880).

laborious work in conjunction with Mellard Reade on Post-glacial beds round Liverpool, and from Canada and other distant places clays and sands arrived for his examination.

Joseph Wright was one of the most generous and helpful of men. No request for information or assistance was ever made to him in vain. He loved to show and demonstrate slides from his great collection to the beginner as well as to the expert ; and many people, including the writer, owed their first glimpse of the beauty and interest of the Microzoa to him. He was an invaluable member of the Belfast Naturalists' Field Club, and contributed much to their Proceedings. The Belfast Natural History and Philosophical Society, and the Liverpool Geological Society, elected him to honorary membership, and the Geological Society of London made him, in 1896, the award of the Barlow-Jameson fund. To the present generation of naturalists he was almost unknown, though his name was known and honoured ; those who still remain who were privileged to work with him mourn a sincere friend, a delightful companion, and a true naturalist.

R. Ll. P.

CANON LETT'S IRISH SPHAGNA.

Determined by J. A. Wheldon.

The herbarium of the late Canon Lett was acquired by the Botanical Division of the Dublin National Museum. It is especially rich in Mosses and Liverworts. The Museum is indebted to Dr. J. A. Wheldon for a critical revision of the peat-mosses in the collection, in accordance with Warnstorf's fine monograph of Sphagnum. Dr. W. A. Lee has already pointed out the desirability of a revised record of Irish Sphagna and in the *Irish Naturalist* for February, 1922, p. 18, and for March, 1923, p. 28, has given two useful lists. The following is a catalogue of the Irish Sphagna in the Lett herbarium, based on Dr. Wheldon's examination and not recorded in Dr. Lee's lists.

T. Johnson.

ADDITIONS TO DR. LEE'S LISTS OF IRISH SPHAGNA.

See *I.N.* February, 1922, p. 18, and March, 1923, p. 28.

Except where otherwise stated the specimens have all been collected by Canon Lett.

S. fimbriatum Wils.
38. var. validius Card., f. spectabile W., sub-f. anocladum Est. et Fax. 38.
var. intermedium Russ. 38.

S Russowii W., var. Girgensohnioides Russ., f. pallescens W. 38 (Lett and Waddell).
f. virescens Russ. 39.

S. fuscum v. Klinggr., var. medium Russ., f. fuscescens W. 18, 27, 39 (Brenan).
sub-f. drepanocladum W. 33.
sub-f. heterocladum W. 18.
sub-f. orthocladum W. 18.
var. pallescens Russ. 27.

S. rubellum Wils., var. viride W. 18, 37.
var. flavum Jens. ap. W. 27 (Lett and McArdle).
f. quinquefarium W. 27.
var. rubescens W. 18, 27, 30, 38 (Stewart), 39 (Brenan).
var. violascens W. 3 (Martin), 6, 16, 27, 36 (Stewart), 39 (Brenan). 40 (Stewart).
var. purpurascens Russ. 6, 10, 18, 27 (Lett and McArdle), 37, 38, 39.
f. speciosum W. 33.
var. versicolor W. 3, 7, 16, 18 (Russell), 33, 35. 39.
var. sordidum W. 37.

S. acutifolium Ehrh., var. viride W. 27, 33, 37, 39 (Brenan).
f. drepanocladum W. 37, 38, 39.
f. heterocladum W. 37.
var. pallescens W. 27.
f. heterocladum W. 39.
var. roseum W. 16, 27, 39 (Brenan).
var. rubrum Brid. 18, 30, 33, 38, 39.
var. versicolor W. 18, 27, 39.
f. venustum Wheld. 37.
f. deflexum W. 7, 29, 35, 38.
f. densum Wheld. 27. 35.
f. robustum. 24.
var. flavo-rubellum W. 10, 15, 35, 39.
var. flavescens W. 1 (I. Carroll), 7, 27, 30, 33 36, 37, 38.
f. drepanocladum W. 7.

S. quinquefarium W., var. viride W. 2, 27, 33, 35, 37.
f. gracilescens W. 33, 39.
f. mastigocladum Wheld. 1.
var. flavum W. 1 (Lett and McArdle), 27, 33, 35, 36.
var. pallens W. 27.
f. heterocladum W. 35.
var. roseum W. 1, 2, 27, 39 (Brenan).
f. brachyanocladum W. 27, 33.
var. versicolor Russ. 1.
f. homocladum W. 33.
f. heterocladum W. 33.
f. drepanocladum W. 36.

S. plumulosum Roll. 20.
var. viride W. 35, 37, 39 (Brenan).
f. laxum W. 33, 39.
f. squarrosulum W. 27, 38.
f. laete-virens W. 38, 39 (Brenan).
f. griseum W. 27, 35.
var. pallens W. f laxifolium W. 27.
f. substrictum W. 1 (Lett and McArdle).
var. coerulescens Schlieph. 1, 16, 18, 27, 31, 38.
var. lilacinum Spruce in Herb. Stabler. 31.
f. orthocladum W. 1 (T. Carroll), 27, 31, 33, 35, 37.
f. compactum W. 6, 18, 27, 30, 31, 33, 37.
f. delicatum Wheld. 3, 30, 37, 38, 39.
var. purpureum W. 1 (Lett and McArdle), 7, 18, 27, 31, 33, 38, 39.
f. robustum W. 3, 18, 27.
f. gracile W. 6, 38 (Lett and McArdle).
var. versicolor W. 1, 16, 18, 27, 33.
f. validum W. 18, 27, 36, 37, 38.
f. tenellum W. 3, 6, 12, 18, 27, 28, 33, 38.
f. ascendens W. 1, 16, 27, 38.
var. flavofuscescens W. 6, 7, 27 (Lett and McArdle), 35.
f. gracile Wheld. 38.
var. ochraceum W., f. congestum W., 27, 38, 4 .
f. immersum W., 27, 35, 38, 39.
f. amentiforme Wheld. 31, 38.
f. orthocladum Wheld. 1, 27, 38.
var. carneum W. 27

S. molle Sull. 38.
var. molluscoides W., f. heterophyllum W., sub-f. pulchellum W. 38.
sub-f. tenerum W. 38.
sub-f. squarrosulum W. 38.
sub-f. typicum Wheld. 38.

S. compactum DC., var. squarrosum Russ., f. densum Card. 27.
var. subsquarrosum W. 38, 39.
f. densum W. 27 (Lett and McArdle), 30, 31, 34, 36, 38.
f. divaricatum W. 1 (Lett and McArdle), 33, 39.
var. imbricatum W., f. purpurascens W. 38.
f. obscurum W. 27 (Lett and McArdle), 39.
f. flavescens Wheld. 27.
var. isophyllum Wheld. 38.

S. squarrosum Pers., var. spectabile Russ., f. elegans W. 38.
f. patulum W. 36 (Brenan), 37.
f. robustum W. 38.
var. subsquarrosum Russ. ap. W. 38.
f. gracile Russ. 27 (Waddell).
f. molle W. 37, 38, 39 (Brenan).
f. densum Russ. 38 (Stewart).
f. cuspidatum W. 37, 38, 39.
f. hydrophyllum W. 37.
var. imbricatum Schimp.
f. silvaticum Wheld. 37.

S. amblyphyllum Russ., var., mesophyllum W., f. sylvaticum Russ. 27, 38, 39.
sub-f. imbricatum W. 31.
f. molle Russ. 6 (Lett and Waddell).
var. parvifolium W., f. Warnstorfii W. 39.

S. pulchrum W., var. fuscoflavens W. 31.
f. brachyhomalocladum W. 31.
var. sordido-fuscum W. 38.

S recurvum P. de Beauv 16.
var. majus Angstr. 7.
f. silvaticum Russ. 1, 2, 27, 35, 38, 39
f. pulchellum W. 6, 35.
f. subundulatum W. 7, 37, 39.
f. sphaerocephalum W. 27, 38, 39.
var. parvulum W., f. flavescens. 39.

S. serratum Anst., var. serrulatum W. 38, 39 (Brenan).

S. cuspidatum Ehrh. var. falcatum Russ. 37.
f. molle W. sub-f. polyphyllum W. 1, 33.
sub-f. eurycladum W. 30, 18
sub-f. tenellum W. 18, 27
f rigidum W. sub-f. pumilum Grav. 33.
sub-f. pungens Grav. 18, 27 (Lett and McArdle), 30, 33, 36, 37, 39.
sub-f. gracile W. 37, 39 (Brenan).
sub-f. aquaticum W. 33, 37.

var. submersum Schimp., f. crispatum W. 30.
f. rigescens W., sub-f. robustum W. 18, 38.
sub-f. subtilis W. 18, 37, 38.
sub-f. densum Ingh. and Wheld. 27, 39 (Brenan).
var. plumosum Schimp., f. remotum W. 37.

S molluscum Bruch. 23 (McArdle), 31.
var. vulgatum W., f. robustum W. 1, 6, 16, 18, 37, 38
f. compactum W. 2, 27, 36, 38.

S. subsecundum Limpr. 6.
var. intermedium W., f. subrufescens Wheld. 36.

S. fallax v. Klinggr., var. laxifolium W. 7.

S. hercynicum W., var. Binsteadii Wheld. 27.

S. inundatum R. et. W. 27, 38.
var. ovalifolium W. 3, 27.
f. brachycladum W. 6, 7, 16, 27, 29, 37.
f. brachyanocladum W. 27, 38.
f. eurycladum W. 38.
f. densum W. 2.
sub-f. brachycladum W. 38.
var. lancifolium W., f. falcatum Schliep. 38.
f. tenellum W. 37, 38.
f. submersum W. 38.
f. Jensenii W. 27 (Lett and Waddell).
var. diversifolium W.
f. rufescens W. 38.

S. auriculatum Schimp. 27.
var. ovatum W., f. brachycladum W. 27.
f. intortum W. 1, 2, 27, 33.
f. variegatum W. 27 (Lett and McArdle), 38.
f. pungens W. 37.
var. cano-virescens W. 27, 38
var. racemosum W. 39 (Stewart).

S aquatile W., var. sanguinale W., f. strictum W. 38.
var. subfuscum W. 39.

S. contortum Schultz, var. gracile W., f. falcatum W. sub-f. fuscescens W. 16, 27
sub-f. sordidum W. 1.

S. crassicladum W.
var. magnifolium W., f. fluctuans W. 38.
f. rufescens W. 30, 40.
f. versicolor W. 6 (Lett and Waddell).
var. diversifolium W. 40.
var. intermedium W., f. ovalifolium W., sub-f. breviramosum W. 27.

S. bavaricum W., var. mesophyllum W. 38.

S. rufescens Nees et Hornsch. 1, 35, 38, 39.
var. magnifolium W., f. rufidulum W. 1, 3, 8, 35, 38.
f. bicolor W. 38.
sub-f. intortum W. 38.
f. albescens W. 37, 38.
f. virescens W. 27, 35, 39 (Stewart).
var. parvulum W., f. fuscescens W., sub-f. intortum W. 38.
sub-f. pulchrum W. 38.

S. turgidulum W., var. teretiusculum W. 27 (Lett and McArdle).
var. insignitum W. 38.
var. fulvum W. 27, 38.

S. imbricatum Russ. 39.
var. cristatum W. 10, 18, 39.
f. glaucescens W., sub-f. squarrosulum W. 16, 37.
f. congestum W. 39.
f. fuscescens W. 18.

S. papillosum Lindb. 35.
var. normale W., f. majus Grav. 27 37.
sub-f. subfuscum Wheld. 1 (Lett and McArdle). 38.
f. squarrosulum Ingh. and Wheld. 37.
sub-f. pulcherrimum Irgh. and Wheld. 37 (Lett and Waddell).
f. brachycladum W. 37.
sub-f. pallescens Wheld. 18, 27, 37, 39.
sub-f. flavofuscum Wheld. 18, 37.
f. confertum W., sub-f. fuscoluteum Wheld. 18.
sub-f. inundatum Wheld. 27.
sub-f. pallidum Wheld. 16
var. sublaeve Limpr. 37.
f. validum W., sub-f. pycnocladum W. 30.
sub-f. submersum W. 27.
sub-f. fuscescens W. 37.
f. breviramosum W., sub-f. heterocladum W. 18, 38.
sub-f. orthocladum W. 38.
f. compactum W. 3, 18, 27, 33, 37, 39 (Stewart).

S. cymbifolium Ehrh., var. glaucescens W., f. squarrosulum Pers. 35.
sub-f. pycnocladum W. 2, 38.
sub-f. immersum W. 35.
f. brachycladum W. 38.
var. pallescens W. 1, 27. 39.
f. confertum Wheld. 33.
var. flavescens W. 24, 27.
f. flagelliferum Wheld. 3.
f. brachycladum Wheld. 16, 38.
f. congestum Wheld. 7, 33, 37, 38 (Lett and Waddell).
var. fuscescens W. 1, 16, 20 (McArdle), 27, 35.
var. atroviride Schlieph. 27.
var. rubescens W. 37.

S. sub-bicolor Hampe. 1 (Lett and McArdle).
var. subcarneum W. 33.
var. fuscescens Russ. 1.

S. medium Limpr. 24. 39.
var. pallescens W. 37.
var. obscurum W. 38.
f. fuscescens W. 18.
sub-f. dasybrachycladum W. 10
var. roseum W., f. abbreviatum W. 10, 37.
f. congestum W. 37.
var purpurascens W. 10, 18, 33, 37, 38.
var. versicolor W., f. compactum Wheld. 10, 37.

National Museum, Dublin.

NOTES.

ZOOLOGY.

Curious Sites for Robins' Nests.

Birds' nests have been seen and heard of in peculiar places. A Robin here which has commenced building operations, and is at present engaged in her task, has chosen a most noisy spot—a printing office, full of the clash'ng of linotypes and the hammering made by compositors locking up "formes." The nesting site is between two stacks of packages of bill-heads on a shelf between two windows. The Robin flies through one of the windows (which the printers have purposely left open) daily, carrying feathers, &c., for its new home. One thing is noticed: if strangers are about, no matter how quiet, the Robin seems to halt a little longer. The printers take a great pride in their new companion.

P.S.—Another Robin has commenced building operations on the same shelf as the first in our comp. room. The first Robin is rearing her young while the male is attending to their wants.

W. J. Mullin.

Cookstown.

On March 22, in the early morning, a Robin lighted on my bedpost, and after announcing itself cheerfully, started building her nest behind the books on the top shelf of my book-case. After breakfast, the room was house cleaned, the books were taken down and the nest thrown out of the window. When peace was declared, the housemaid gathered a handful of dead leaves and put them where the bird had put hers. The invitation was accepted and the nest was finished on April 1. On April 5 there were two eggs, three on the 6th, four on the 8th, and five on the 10th, when she started to sit. In the early mornings, the cock often came into my room, and shuffled about on the dressing table until the hen flew off the nest and joined him outside. On April 22 she never left the nest, and I saw him at work for the first time; all day long, he was carrying big worms to her. When it was dark, he was in the nest and I could still hear him feeding her. On the 23rd he was no longer seen, and the mother bird was busy feeding her three young herself with wriggling white worms. I would like to know whether the male Robins help in the hatching or not?

Strandtown, Belfast. Aileen Smiles.

Three Robins selected curious nesting places in our grounds at Ardaluin, near Newcastle, for building their nests. One built (last year) in a fruit basket hanging on the wall of the garden furnace-house, the door of which was never closed. Two others this season (1922) built in old fruit cans; one of these was on the ground under some bushes. We fixed another old fruit-tin up among the branches of a rhododendron, in which a third Robin built, laying five eggs.

Patrick and Basil Berry.

Ardaluin, Newcastle.

The Squirrel in Ireland.

I am glad Mr. Armstrong has drawn attention in the May number to the story of the tame Squirrel in connection with Queen Maev Although I think we are scarcely justified in taking the contents of the "Tain Bó Cuailnge" as historical evidence, our editor Mr. Moffat, as well as Mr. Le Fanu and myself, are satisfied that the Squirrel was formerly indigenous in Ireland. The only problem that remains to be solved is whether all the Squirrels now living in Ireland are indigenous or no. Mr. Moffat has brought forward evidence (in the April number) that, so far as eastern Ireland is concerned, the Squirrel is derived from the stock introduced into this country in the latter part of last century. It is probable that the Squirrel was also entirely destroyed in the south-west a few centuries ago, but I am not satisfied that the old stock was altogether exterminated in the west of Ireland. I am, however, quite open to conviction, and indicated a method, in my original article (vol. xxxi, pp. 51–54), which, in my opinion, might throw further light on the question. As regards the Irish word "togmall" or "togán," which had been rendered as meaning Squirrel, Mr. Forbes in his dictionary of the Scottish-Gaelic names of beasts, birds, &c., translated "taghan" or "taoghan," by Marten, and Dr. Best has a similar reference. There is no reason therefore to assume that the tame animal Queen Maev had for a pet was a Squirrel.

Knockranny, Bray. R. F. Scharff.

BOTANY.

The Cranberry in Glenasmole.

On the slopes east of the Upper Dodder, opposite the plantation behind Glenasmole Lodge, is a conspicuous patch of wet boggy ground. When crossing this in May, 1922, I suddenly found myself surrounded by a luxuriant growth of Cranberry, *Vaccinium Oxycoccus*, just coming into flower. This appears to be only the second record for this plant in Co. Dublin, it being known to Mr. Colgan only from "a boggy hollow on the northern face of Glendhu Mountain" at 1,900 feet.[1] The elevation of the Glenasmole station cannot be more than 800 to 900 feet.

Rathgar, Dublin. A. W. Stelfox.

Red Cowslips.

For many years I have been acquainted with two small patches of these, growing a few yards apart in an old pasture on limestone, about 70 feet above the sea, at Greenwood, near Feltrim Hill, Co. Dublin. Yellow Cowslips are abundant on the same ground, as are Primroses, but at a lower level, and I never saw any red ones amongst the latter.

Baily, Co. Dublin. A. L. Massy.

[1] See "Flora of the County Dublin," p. 129.

IRISH SOCIETIES.

ROYAL ZOOLOGICAL SOCIETY.

A splendid example of Chapman's Zebra, recently purchased, is one of the most important additions made for some time to the collection of animals in the Gardens. Other recent arrivals include a number of Sooty Mangabeys, a Himalayan Bear, and a Leopard. A Zebu calf was born early in March. 10,000 Loch Leven Trout ova and 5,000 Salmon ova have been placed in the hatcheries.

BELFAST NATURALISTS' FIELD CLUB.

April 17.—The annual meeting of the Club was held, the President (Rev. W. R. Megaw, B.A.) in the chair. The reports submitted showed that the Club, which has this year reached its diamond jubilee, is in an exceedingly prosperous condition. The membership was increased by 117 during the year, and now stands at 571, and the finances, under the management of the honorary treasurer (T. Edens Osborne) showed a corresponding improvement. The office-bearers for 1923-24 were appointed as follows :—President, J. A. Sydney Stendall ; Vice-President, A. P. Hoskins ; Honorary Secretaries, A. Albert Campbell and Thomas M. Deans ; Honorary Treasurer, T. Edens Osborne ; Honorary Librarian, W. M. Crawford ; Honorary Secretaries of Sections, Robert Bell (geology), Nathaniel Carrothers (botany), James Orr (zoology), W. A. Green (archæology), and J. R. H. Greeves (junior). Rev. W. R. Megaw and S. A. Bennett, A. M'I. Cleland and John T. Greeves were added to the Committee.

The outgoing Honorary Secretary (A. M'I. Cleland) was cordially thanked for his lengthy and energetic service to the Club.

Reference was made to the recent deaths of W. H. Phillips (a foundation member), W. J. Fennell, F.R.I.B.A., and Joseph Wright, F.G.S., all of whom took an active part in the Club's work in bygone days. Sympathy was expressed with Mr. Crawford in the loss of his wife and the serious injuries sustained by himself in the recent shocking railway-crossing accident at Dunmurry.

Rev. Robert Workman (a foundation member) and Nevin H. Foster were elected Honorary Members.

ON THE ORIGIN OF THE IRISH CATTLE.

BY R. F. SCHARFF, B.SC., PH.D.

MANY different breeds of cattle are kept in Ireland at the present time, but the farmer does not trouble himself much about their origin. It is the yield and quality of the milk, or the quantity and character of the meat that interest him. For several generations past various breeds have been introduced into this country from Great Britain and abroad. It is not my intention to trace the original home of these cattle. What I hope to be able to show is what kind of cattle lived in Ireland in remote historic and even in prehistoric times, and then endeavour to ascertain where these cattle were domesticated. For it is evident that, like all other domesticated animals, the ox and cow must have had wild ancestors. It is possible that wild cattle inhabited Ireland and gave rise to the old domestic stock. But we must carefully sift the evidence for the belief that wild cattle inhabited Ireland and were domesticated in this country by the early inhabitants. If wild cattle never existed in Ireland, some early settlers must have brought their domesticated stock with them from abroad. Quite a number of interesting questions await an answer. Whether they can be answered at all in the present state of our knowledge remains to be seen. But in the course of our enquiries I think we shall elicit some valuable information which has not yet been presented to the readers of this magazine. Moreover, anything that can increase our knowledge concerning the Irish cattle and their past history must be of value and interest.

The late Sir William Wilde[1] recognised four distinct native breeds of cattle as living in this country in the early part of last century. The first of these he called the "Old Irish Cow." It was of small stature, long in the back, and possessed moderate-sized, wide-spreading, slightly elevated and projecting horns. The colour of the breed seems to

[1] Wilde, W.: On the modern and ancient races of oxen in Ireland. Proc. R. Irish Acad., vol. vii., 1858.

have been mostly red or black. They were famous milkers, required little care and abounded all over the plain country. A much smaller breed was the Kerry, and this was either red, brindled or black in colour. This second native breed had small heads with rather short horns turning upward. Now this breed still exists in its pure form in the mountains of Kerry and Cork. Formerly it seems to have ranged all over the country.

The third race or breed was termed the "Irish long-horn" by Sir William Wilde. It was similar to, but not identical with the Lancashire and Craven breed. While many heads had wide spreading horns and only slightly curved, the great majority of the horns turned in so completely that they crossed either in front or behind the mouth. These cattle were generally red or brindled and grew to a great size. The thick hide was valuable. The breed was common chiefly in Roscommon. Even in Sir William Wilde's time it was almost extinct, and had been replaced by the more modern "short-horn." The fourth breed which is hornless, was known and is still known as "the moyley," or "moyleen"—probably a corruption of the Irish word "*maoilin*," meaning a hornless cow. It is either dun, black or white in colour, very rarely mottled.

Of these four native breeds which existed in Ireland, according to Sir William Wilde, about a hundred years ago, two have survived to the present day, namely, the Kerry and the hornless. The former is still largely confined to the mountainous region of the south-west, whereas the other is only found in a few examples in various parts of the country Prof. Wilson tells us that there are one or two herds picked up by owners who wish to keep the breed alive. He entirely disagrees with Sir William Wilde's statement that this breed is ever black. He is positive about its being always yellow. As to the origin of the hornless cattle, Prof. Wilson is of opinion that they were originally brought to Ireland from Scandinavia many centuries ago.[1]

[1] Wilson, James: The Scandinavian origin of the hornless cattle of the British Isles. Sc. Proc. R. Dublin Soc., vol. xii. (N.S.), 1909.

In a subsequent paper, Sir William Wilde incidentally stated that, as the result of his continental travels, he had modified the views previously expressed on the breeds of Irish cattle. He did not there and then define the particulars in which his opinions differed. He evidently meant to do so later on, but did not.[3]

Anyhow, William Youatt, who was always held in esteem as an authority on cattle, was positive that about a hundred years ago there existed only two distinct breeds of Irish cattle. These were what he calls "middle and long-horns," one being the small Kerry, plainly an aboriginal breed, and the other of much larger size with long horns. His suggestion is that the latter was probably an old or partially improved Craven or Lancashire beast. Nevertheless, Youatt acknowledges that two kinds of such long-horns, namely a larger and a smaller, may be distinguished, the 'atter being principally found in the North of Ireland. Although the characters of these cattle seemed to him essentially different, he suggests that one may be the result of indifferent or bad management of an originally similar stock. It seems strange that the author omits all reference to the Irish hornless breed which has been alluded to above.[4]

Another later writer agrees with the opinions expressed by Youatt concerning the presence in Ireland of two breeds, viz., the Kerry and the long-horn. He contends that the latter was originally an inhabitant of the western parts of the British Islands, and that it extended over nearly the whole plain of Ireland and even the greater part of the mountains. He says that it still forms the prevailing race of the country. And yet, he continues, in the west there exists a race which differs in almost every respect that constitutes a breed from the long-horns. Whereas Ireland and the western parts of England have had for an unknown period a race of cattle having long horns and furnished with

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[3] Wilde, W.: On the unmanufactured animal remains belonging to the R. Irish Academy. Proc. R. Irish Academy, vol. vii., 1859.

[4] Youatt, W.: Cattle, their breed, management and disease. London, 1834.

thick skins and abundant hair fitted to protect the animals against long-continued rain, the eastern and drier districts have been inhabited by varieties with thinner skins and shorter hair and horns. Like the previous writer, Low omits all reference to the Irish moyley, or hornless breed.[1]

Long before the beginning of the last century, cattle were imported into Ireland with the result that the breeds already in existence in that country became altered and modified in character. Prof. Wilson tells us that the three large breeds that were then brought into Ireland were the long-horns, short-horns and Herefords.[2]

It seems likely, therefore, that the long-horns and other breeds of cattle found in the lowlands a hundred years ago owe their presence in Ireland to such importations, and that only the Kerry cattle can be looked upon as an aboriginal breed. This accords with the views supported by Prof. J. McKenny Hughes, who urged that even before the wild ox (*Bos primigenius*) had entirely disappeared from England, the native short-horn was present in Britain. This he describes as a small animal about the size of the Kerry breed, remarkable for the height of the forehead above the orbits, for its strongly-developed occipital region, and its small horns curved inward and forward. If it was not indigenous, he thinks it must have been introduced by man into the British Isles at a very remote period. Nilson even claims that it was once wild in Sweden. This, remarks Prof. Hughes, is the native breed with which we must start in all our speculations as to the origin and development of the British oxen.[3] He considers the Kerry cattle to be the most typical examples in the British Islands of this what he calls "Celtic short-horn," whereas the Chillingham breed is the nearest representative of the cattle introduced by the Romans. I shall again allude to this peculiar race of white cattle later on.

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[1] Low, David: The breeds of the domestic animals of the British Isles. London, 2 vols., 1852.

[2] Wilson, James: The origin of the Dexter-Kerry breed of cattle. Scient. Proc. R. Dublin Soc. (N.S.), vol. xii., 1909.

[3] Hughes, J. McKenny: On the more important breeds of cattle which have been recognised in the British Isles in successive periods. Archæologia, vol. lv., 1896.

One of the latest writers to study the Kerry cattle is Dr. Lundwall, who came to Ireland from the Agricultural College of Vienna for this special purpose. As the result of careful comparisons and measurements he arrived at the conclusion that the Kerry cattle are practically identical with the old breed of cattle living in Brittany. This leads him to the suggestion that the same race of Celtic tribes had invaded Brittany as well as Ireland, and brought their cattle with them.[4]

There is not much more to be gathered from recent authorities as to the nature and breeds of Irish cattle in the eighteenth century, or earlier centuries. We must, therefore, test other methods in tracing the development and history of the breeds. Long ago when the early tribes of Ireland still retained their wandering habits and moved about wherever the herbage afforded sustenance to their cattle, they surrounded their temporary homes with breast-works of earth and stones, and surmounted the whole with a stake fence. When further security against wild animals and hostile tribes was desired, many of the tribes moved their dwellings to the lakes. Shallow ground or an islet was generally chosen, and stakes were driven into the ground. The latter were probably interlaced with saplings, forming a stockade which rose above the water. On this platform were erected wooden cabins in which the people lived. Similar lake-dwellings are known from Switzerland and other parts of Europe. The remains of several hundreds of such "crannogs" as they are called, derived from the Irish word *crann*, a tree, have been discovered in this country. Many of the lakes in which these crannogs originally stood have since been drained so that the structure of these lake-dwellings can be closely investigated. Moreover, the weapons, tools and ornaments and all the household rubbish including the remains of the food consumed, are found beneath the site of the dwellings. The collection of the Royal Irish Academy in the National Museum contains hundreds of interesting objects obtained by a careful

[4] Lundwall, E.: Studien über das irländische Kerry-Rind. Mitt. d. landwirt Hochschule f. Bodenkultur, Wien, vol. ii., 1913.

examination of such ancient household rubbish heaps. Their study has enabled experts to date approximately the various crannogs. Now among these finds there were a large number of skulls of cattle, and we are thus able to determine what breeds existed in Ireland in early Christian times. A particularly large horde of skulls and bones of domestic animals was discovered in the bog of Lagore, near Dunshaughlin, Co. Meath. They were in what was undoubtedly the remains of a crannog of over 500 feet in circumference. This crannog dates from the 10th century, and Sir William Wilde describes the skulls as belonging to the straight-horned, curved-horned, short-horned and horn-less types. Two of the skulls bear the character of the ancient large *primigenius* race. As no representative of this breed has ever been found in earlier Irish deposits, we must assume that in the 10th century we already had breeds of cattle in Ireland which were imported from Great Britain and abroad.

A good deal of confusion exists among the various writers as to the term "short-horn" and "long-horn." Sir William Wilde describes the Kerry breed as having rather short horns and so does Youatt, while Hughes considers it as the most typical example of the Celtic short-horn. Lydekker, on the other hand, describes the horn of the Kerry as being fine and long, and states that the Kerry is related to the "Welsh runt" as well as the Highland cattle of Scotland which have relatively long horns. And yet we are told that the modern shorthorn is a breed entirely distinct from the Kerry. The confusion in terminology arises from the fact that the length or shortness of the horn are only utilized as convenient terms of description. It is not so much in terms of measurement as relatively to the size of the animal that the horns may be described as either long or short. The horns of the Highland cattle only appear to be long relatively to the size of their bodies, and it is more in the general conformation that these and the Welsh and Irish breeds are related to one another.[1] The breed known as the "shorthorn" seems to be a compara-

[1] Lydekker, R.: The ox and its kindred. London, 1912.

tively modern one. They are large cattle with relatively short horns specially fitted by their early maturity for the supply of butchers' meat.

There are certain Irish place-names, like "Inishbofin," meaning the island of the white cow, and Lake Bofin, which seem to imply the former existence in this country of white cattle. The survival in Great Britain of several herds of white cattle from very remote times has given rise to a great deal of discussion as to their origin. Although now confined in large parks, they were formerly allowed to roam about freely in a nearly wild condition, and some authorities still maintain that they were the direct descendants of truly wild cattle. The white cattle in these parks are not all of the same kind. The most famous herd is that of Chillingham, in Northumberland. These cattle are small, with rough white hair and short upwardly-directed horns, while the Chartley herd has long wide-spreading horns. In the Cadzow herd the cows are hornless. There are many minor differences among the various herds. Some of these cattle exhibit a strong tendency to produce black calves, and these are of course always weeded out. Hence Lydekker suggests that all these herds of white cattle had originally descended from a black stock. This view seems more plausible than that put forward by Prof. Hughes and accepted by Wilson, that the white cattle are descended from an Italian stock introduced by the Romans. Cattle similar to the Chillingham breed certainly appear to have existed in Great Britain in Roman times, for Meek and Gray, who conducted the examinations of the Roman site at Corstorpitum, described the remains of an apparently wild ox (*Bos sylvestris*), of which the living representative is stated by them to be the Chillingham.[2] Although there is no direct evidence of the former existence in Ireland of similar herds of white cattle, it is quite possible that some examples may have been imported from England or Scotland. That importations of cattle from Great Britain and abroad took place before the tenth century may also be

[2] Meek, A., and R. A. H. Gray: Report of the excavations at Corsporpitum. Newcastle-upon-Tyne, 1911.

gathered from historical evidence. The interesting and celebrated tale of the "Táin Bó Cúalnge" comes to us in several versions from about the tenth century, although the original is probably much older. It contains few descriptions that might enable us to identify the breeds to which allusion is made, but there is enough to justify the belief that importations of cattle had already occurred in those remote times. In Mrs. Hutton's beautiful poem in which the whole story is told in a most attractive manner, we read of a bull whose hooves and head were white, the rest of his body being red, as though he had been dyed with partar-red, and further on the author tells us how Morevega threatened to overwhelm Cucullin by leading against him a hundred red and hornless heifers.[3] As Prof. Wilson has shown, the Celtic breed of cattle was originally black and horned. Hence the red bull and the red hornless heifers were importations or the produce of such.

One of the foremost investigators on the origin of European domesticated cattle was the late Prof. Rütimeyer.[4] The discovery in Switzerland among the rubbish heaps of the lake-dwellings of a large number of skulls and skeletons of cattle that had lived in the country many centuries ago formed the basis of these researches. He was able to distinguish the remains of three races of oxen, all of which had lived in Switzerland during the Stone Age. It cannot be computed with any degree of accuracy about how many years ago Europe passed through the Stone Age. Certain it is that it was long before the Christian era, and that it lasted for many centuries. The Stone Age in Europe with its primitive culture was coexistent with a high state of civilization in Egypt. Rütimeyer named the three breeds *trochoceros, primigenius,* and *brachyceros,* and they all had been domesticated in those remote times. It is interesting to note that to the last race belong the Kerry variety of cattle and that of Brittany. The same breed has been met with in ancient deposits in Great Britain, in Sweden, Holland, and many other parts of Europe. The name

[3] Hutton, Mary A.: The Táin, Dublin, 1907.

[4] Rütimeyer, L.: Fauna der Pfahlbauten der Schweiz. Basel, 1861.

brachyceros had already been applied to quite another kind of ox, so that Prof. Owen changed it to *longifrons*. The same author's statement that skulls of this small form of ox had been found in the shell-marl of Ireland together with the remains of the Irish Elk lacks confirmation, and seems to me extremely improbable. In the extensive Irish peat deposits it occurs frequently, but they are of much more recent date than the underlying shell-marl.[5]

That the small Celtic breed of oxen was the only domesticated race existing in England and Scotland at the time of the Roman invasion, is the view supported by Prof. Boyd Dawkins. [6] As the result of examining the bones of animals from many Roman sites he concluded that this breed abounded in Great Britain during the Roman occupation to the exclusion of the larger breeds. But as we have noted from Meek and Gray's researches, a larger wild breed appears to have lived in northern England in Roman times. That a small breed was the only kind of cattle occurring in early Christian times and during the preceding ages in Ireland, is proved by the bones and teeth of oxen found in Irish caves. And from the fact that in the ancient Irish Brehon Laws the measurement of a cow is given as twenty hands in girth, it would appear that the usual size of cattle was then much smaller than it is now. No remains of large cattle have ever been met with in the older Irish cave deposits. All the bones and teeth belong to a small breed similar to but somewhat smaller and more slender than the existing Kerry race. The view that wild oxen ever inhabited Ireland is not supported by palæontological evidence, and Prof. Owen must have been misinformed when he stated that ox remains had been found together with those of the Irish Elk. The opinion that wild oxen once roamed about the plains of Ireland is founded mainly on the testimony of Sir William Wilde who quoted a curious

[5] Owen, Richard: A history of British fossil mammals and birds. London, 1846.

[6] Dawkins, W. Boyd: British Pleistocene Mammalia. Palæontographical Society, London, 1878.

Irish zoological poem in support of his contention. Mr. Eugene Curry, the translator of the poem, believes it to be as old as the ninth century, and at that time certainly the wild oxen, if they ever did exist in Ireland, must have been long since extinct. The interest of the poem lies in the fact that it describes how Cormac Mac Art, the monarch of Erin, consented to liberate his prisoner Finn Mac Cumhaill when a ransom of two of every wild animal of Ireland were brought before him on the green of Tara. The poem relates the sequence of this offer, and among the wild animals are mentioned two wild oxen from the Burren.[1] This place in County Clare is as inhospitable and wild as any in Ireland, and would be just the place where herds of wild cattle might once have lived. But in that case wild cattle must have had a wider range in still more remote times. They would have existed in every suitable district in Ireland and have left some trace of their former presence in the more ancient deposits, where they are, as far as we know, completely absent. Hence I venture to think that without much stronger evidence we are not entitled to conclude that wild cattle inhabited Ireland. I believe that the small Celtic breed (which is known as *Bos longifrons* or *brachyceros*) was brought to Ireland long ago, certainly in pre-Christian times by the early settlers, and that no wild race ever inhabited the country. There is no doubt that wild cattle existed in Great Britain, as I have already pointed out.

Types of cattle similar to those living in Ireland in those remote times live in Great Britain and the continent of Europe during at any rate, part of the Stone Age. It has been argued that this small breed must have been domesticated in Europe from a wild ancestor, but we are specially indebted to the Swiss zoologist, Dr. Duerst, whose brilliant researches have traced the origin of the breed to another continent. Nearly 25 years ago he showed that the shorthorn cattle of Asia Minor and of north and east Africa undoubtedly belong to the *brachyceros* (=*longifrons*)

[1] Wilde, W.: On the unmanufactured animal remains belonging to the Academy. Proc. R. Irish Academy, vol. vii., 1860.

race of domestic cattle. And he argued that this breed must have originated in Asia, and have been domesticated there long before the commencement of the culture of the Babylonians.[1] Prof. Keller, who was able to identify this breed of ox on many of the ancient monuments, pleaded in favour of its African origin.[2] The excavations conducted under the auspices of the Carnegie Institution of Washington at Anau in Turkestan, however, enabled Duerst to resume his investigations into the origin of our small race of cattle. In the lowest deposits, all the bones of oxen were those of a wild species apparently *Bos namadicus* of Falconer and Cautley, which is an extinct Asiatic wild ox. It was only in the upper layers that domestic cattle bones made their appearance. These belonged to a larger breed than *Bos brachyceros*, and were long-horned. The same breed lived in Egypt, but there is evidence for the belief that it gradually diminished in size. It was also known in Mesopotamia during Babylonian times, about 4,000–5,000 B.C. Chinese records place the arrival in China of the long-horned ox in the year 3468 B.C. It has been ascertained at Anau that the earliest remains of the domestic long-horned cattle appeared approximately in the year 8000 B.C. Already 2,900 years later there are distinct evidences in the Anau deposits that the large-horned breed had not only become smaller in size, but that its horns had diminished in length. It had, in fact, become metamorphosed into a short-horned race which cannot be distinguished from the European *Bos taurus brachyceros* or *longifrons*. Whether this diminution in size was due to insufficient nourishment, the pairing in an immature condition, or to changes in the climatic conditions, or to a combination of these causes, adverse influences no doubt acted on the old breed in the production of the new one. It was not in Turkestan alone that the originally large and stately ox was transformed into the stunted short-horned form. A similar change took place in Mesopotamia. Dr. Duerst therefore expresses

[1] Duerst, J. U.: Die Rinder von Babylonien, Assyrien und Egypten und ihr Zusammenhang mit den Rindern der alten Welt. Zürich, 1899.

[2] Keller, C.: Die Abstammung der älteren Haustiere. Zürich, 1902

the opinion that the ox of Turkestan, which underwent this transformation at approximately 7,000 years before the Christian era, finally reached Europe after travelling with the early Asiatic invaders through southern Russia.[1] Thus the ancestors of the Irish Kerry cattle which had their origin in Asia probably reached Ire and from the cont'nent during the late Stone Age.

NOTES.

Homing Instinct in the Swift.

On the evening of 19 April last I was on the look-out for Swallows, whose arrival had been reported to me the previous day, when I suddenly saw three Swifts flying from the south. They flew around in the usual circles over our garden for some minutes, when one bird separated from the others and swept down at great speed, but quite silently, and dashed past the north side of the church, and then rising again joined the others. This performance was repeated four times, after which the bird remained with the others, flying about over the ruins of the new barracks, where members of the species nested in former years. This occurred between 6.30 and 7 p.m. I kept the birds under constant observation, and just at 8 p.m., one bird again separated itself from the others, a fourth bird had in the meantime arrived, and dashed down past the north side of the church about six times and eventually roosted there.

As I had been keeping careful and constant watch in the garden for some days, it is evident that these birds had just arrived. The north side of the church is much enclosed by houses, the hill rising rather abruptly just there, yet two or three pairs of Swifts nest there every year. It would be a most unlikely place for any stray Swift to visit, and hence it may be assumed that the bird in question had either nested there or been reared there. Otherwise why didn't the other three birds pay it a visit also? It is very interesting to note then that within ten or fifteen minutes of its arrival at its native town, the bird actually visited its old nesting haunt, and roosted there that night as it did also the following nights. I may add that in this district our spring migrants have been exceptionally early on their arrival this year.

W. M. Abbott.

Fermoy.

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[1] Duerst, J. M.: Animal remains from the excavations at Anau (Turkestan). Carnegie Institution, Washington, no. 73, 1909.

FOOD OF THE IRISH SQUIRREL.

BY C. B. MOFFAT.

It has been suggested to me that a study of the feeding habits of the Squirrels now resident in Ireland should yield results that might be helpful towards a solution of the question whether these animals are entirely derived from an introduced stock, or may be in part descended from Squirrels of that aboriginal stock that inhabited the old Irish forests in by-gone days.

As I kept pretty careful notes on the feeding of these animals in County Wexford for about twelve years (from the time of their arrival at Ballyhyland in the summer of 1890, until the year 1902, after which my opportunities for continuing such notes became much fewer), I think it may in some degree meet this suggestion if I now lay before readers of the *Irish Naturalist* a brief summary of the results.

It must, of course, be borne in mind that the Squirrel's diet in different localities must vary to some extent according to the nature of the choice of foods offered. I will have to advert to one rather significant difference between the feeding habits observed in Co. Wexford and those noted during visits to Fassaroe, Co. Wicklow. But I believe that the choice of foods offered in the woods about Ballyhyland and in the surrounding area at all seasons of the year was sufficiently large to give a very fair indication of the manner in which a Squirrel would seek to support himself in any part of Ireland to which he might be transferred.

The Squirrel's principal supply during all the years when I had him under notice in Co. Wexford was derived from trees belonging to five familiar species, which I name in the order of their importance to the animal :—the Scotch Fir or Pine (*Pinus sylvestris*), the Larch (*Larix europæa*), the Beech (*Fagus sylvatica*), the Spruce Fir (*Picea excelsa*), and the Oak (*Quercus robur*). Next in importance to these five trees came the innumerable kinds of fungi on which the

Squirrel feeds most extensively during the summer and autumn months. After the fungi I place foods derived from a few other trees less largely patronised than the five I named first. These (according to my notes) are the Spanish Chestnut (*Castanea sativa*), the Maple (*Acer campestre*), the Hawthorn (*Crataegus oxyacantha*), the Yew (*Taxus baccata*), and the Silver Fir (*Abies pectinata*).

I do not find the Ash, Elm, or Sycamore mentioned, though it is probable that the seeds of all may be occasionally consumed. To the list of foods I must, however, add the common Blackberry, and I have reason to think that Bilberries sometimes also furnish a meal.

Now as to the extent of the Squirrel's dependence on each of the named sources of supply, I will take the various trees in order.

(1) *The Scotch Fir.*—This tree is placed first because its cones are abundantly consumed by the Squirrel during every month of the year, and because it can always be relied on to bear an abundant crop. The fresh green cones are first attacked in a forward year in June, otherwise in July ; but they continue to be extensively eaten throughout the whole year, and yield a supply so unfailing as to render any idea of a winter hoard for the Squirrel absurdly unnecessary. During the winter months, and especially in December and January, the Squirrel also feeds largely on the buds and young flowering shoots of this Pine, which continue to be eaten until May.

(2) *The Larch.*—The utility of this tree is in many years quite equal to that of the Pine, for its cones are an equally favourite food from the time when they are attacked in their green stage in June or July until the next crop is ready, or for several months longer if the next crop should fail. The tree must, however, be put second to the Pine, because it cannot be trusted to produce a crop of cones every year. In 1891, for example, it produced none in the Ballyhyland neighbourhood, and in 1893 it was almost a total failure. In the early part of the year (chiefly in February), the buds of this tree, as well as the cones, are eaten.

(3) *The Beech.*—At two seasons of the year the Beech is of great importance to the Squirrel. In a year in which beech-mast is plentiful, it is preferred to every other food, so that from the middle of August until sometime in October, even the Pine and Larch are neglected. Unfortunately the crop of beech-mast is quite as uncertain as that of larch-cones, and totally failed in Co. Wexford both in 1891 and in 1893. In spring, however, the Beech again becomes a source of supply, and in two different ways. In April, when the beech-leaves are at their greenest, the ground may sometimes be seen literally carpeted with thousands of these leaves, which the Squirrels have bitten off and dropped, eating merely the fresh leaf-stalks, for which they evidently have an extraordinary relish. And during the greater part of May, the animals spend much of their time grubbing up the seedling Beeches to eat the succulent underground parts of the plant. It was quite common to see four or five Squirrels on the ground at this work at once in years of a good beech-harvest.

(4) *The Spruce Fir.*—The green cones of the Spruce are pretty freely eaten from July onwards until October, and occasional meals of the same food are made during the winter and early spring months. May and June are the only months in which I have seen no trace of the Spruce being fed on. Besides its cones, the young flowers of this tree are a tempting morsel, for which, early in the year, the Squirrel bites off the young shoots, so as to get at the buds which would otherwise be protected by the spines of the foliage above and below them.

(5) *The Oak.*—Our native *Quercus robur* comes only fifth in the list of useful trees, for though its acorns are certainly eaten, they seem to be held in very little esteem and in any case they only furnish food during three months (September, October, and November). If a winter store were wanted, they might, perhaps, be hoarded, but I have never seen our Wexford Squirrels hoarding food, and they certainly have no need to. The Oak, it is true, yields other foods besides its acorns. At least three kinds of galls found on this tree are much eaten. The very abundant "marble

gall" (*Cynips Kollari*) is frequently bitten through during the winter months (December to March), for the sake, I presume, of a meal at the expense of the imprisoned insect. The almost equally abundant "flat button gall" (*Neuroterus lenticularis*) is licked off from the under-surface of the shed oak-leaves, for which the Squirrel searches under the trees at mid-winter. And in June the beautiful "cherry-gall" (*Cynips quercusfolii*) is crunched up where it grows, on the under-side of the fresh leaves. Probably some of the other galls are similarly treated. A lichen that grows on the trunks of oaks is also eaten in May and June, if not at other times also. One cannot, however, regard either the lichens or the galls as capable of affording substantial food in the absence of other fare.

(6) *The Spanish Chestnut.*—As might be expected, the Squirrel greatly enjoys the fruit of this tree when he can get it. It is, however, nowhere very abundant, and its crop is, in this country, very uncertain. October is the principal month in which it is available.

(7) *The Maple.*—Another tree too scarce to be accorded great importance, but much frequented by Squirrels in October for the sake of its seeds, and in November and December for its buds, which seem to be greatly liked.

(8) *The Hawthorn.*—Haws are sometimes eaten in a winter, and would doubtless get larger custom if other and better-liked foods were not so abundant.

(9) *The Yew.*—Occasionally a Squirrel indulges in feast of yew-berries.

(10) *The Silver Fir.*—Young shoots of this tree are bitten off in early summer (chiefly in June), and some food must be obtained from them. The cones of the Silver Fir are, I think, never eaten.

The above-named ten are all the forest-trees in which I have any proof that our Co. Wexford Squirrels fed.

Of the fungi I will not say much, as I have little acquaintance with them; but they are certainly a very substantial part of the Squirrel's fare, especially in May and June, and again in September and October. Some that are commonly considered very poisonous, such as the well-

known "stump mushroom" (*Hypholoma fasciculare*), are readily eaten. Unlike most of the trees above-named, fungi must always have been readily obtainable in Irish woods; but, of course, they are only plentiful during about six months of the year.

Blackberries and Bilberries may be classed rather as dainties than as articles of diet, and I have no proof that they are more than occasionally eaten.

Some surprise may, however, be expressed that I have not mentioned the Hazel (*Corylus Avellana*). As the Squirrel's love both of eating and of storing hazel-nuts is almost proverbial, an explanation is evidently needed for this omission.

The cause is partly local. In Mr. Barrington's woods at Fassaroe, I often saw the remains of hazel-nuts that had been eaten by Squirrels, though I never saw anything of the kind near Ballyhyland.

The reason for the difference, however, is that in Mr. Barrington's woods the Hazel grew intermixed with the Larch and Pine, in whose branches the Squirrels habitually fed, so that they had not to leave their ordinary feeding-grounds to go nutting. At Ballyhyland we had no Hazel in the woods of mixed timber in which the conifers grew. There was abundance of Hazel in the natural oak-wood that occurred in the immediate neighbourhood; but—as I observed in a previous article—the Squirrels avoided this wood, showing that they did not care sufficiently for either hazel-nuts or acorns to travel the short distance (not half a mile) that parted the nearest bit of natural forest from a plantation yielding larch-cones and pine-cones.

It will be seen from the above note that an overwhelming preponderance of the food on which our Irish Squirrels appear to subsist at the present day is food that could not have been obtained in any of the natural woods of old Ireland since the time (whenever that may have been) of the practical disappearance of our native Scotch Fir. The Squirrels that lived in Irish woods since the extinction of that tree, and before the introduction of the present stock of conifers and beeches, must—if their tastes at all resembled

those of our modern Squirrel—have subsisted chiefly on acorns, hazel-nuts, fungi, and such minor dainties as haws, blackberries, and various oak-galls. They would, I think, have found it absolutely necessary either to hibernate or to lay up a winter store ; for of the above-mentioned foods, only the haws and some of the oak-galls would be obtainable in the winter months, and none of them could be trusted in a hard season to last the winter through.

Our modern Squirrel does not, in my opinion, undergo even a partial hibernation. Daily throughout the winter he is to be seen abroad in the trees, as numerously as in the height of summer, and as well provided with food. If he ever stores up nuts or acorns I have no evidence of it, and it could only be the survival of a habit for which there is no longer any use. I do not think an animal of such easy-going ways could ever have bridged the gulf between the felling of the last Irish pine-forest and the re-plantation of the country with our present stock of coniferous trees. If he did so, he must have had some means of subsistence to which his present descendants do not resort.

IRISH SOCIETIES.

BELFAST NATURALISTS' FIELD CLUB.

May 19.—Excursion to Black Mountain.—Forty-five members assembled at Woodvale Park at 2.30, and under the conductorship of Mr. Robert Bell, walked to the site of the prehistoric flint factory on the Black Mountain, on the east side of the hill at an elevation of about eight hundred feet. Two areas have been carefully dug over, and have yielded a large number of flint flakes, but comparatively few implements, and these of a very early rude type. The finds include implements with spurs, the use of which is unknown ; a leaf-shaped implement of proto-Solutrian type, an occasional antler of the red deer, scrapers, hammer-stones, and cores.

The party got to work with hammers, pocket picks and walking sticks, and quite a considerable number of specimens were unearthed.

Few plants of special interest were noted.

At a short business meeting (Rev. W. R. Megaw, B.A., presiding), nine senior and seven junior members were elected.

JUNE 2. EXCURSION ROUND THE ANTRIM COAST.—Conducted by R. J. Welch, a party of 90 members and friends motored from Belfast *via* Larne and Cushendall to Ballycastle, and thence back *via* Armoy and Ballycastle to Belfast. For the whole distance the route lay through country of high interest to the naturalist, but the travelling was too continuous to allow of any original work being done. The well-known and striking geological features of the coast were seen to advantage, and many of the characteristic plants were noted from the chars-a-banc. The members of the new Route Field Club joined the party at Murlough. A very enjoyable day was spent.

JUNE 16.—EXCURSION TO BRAID VALLEY.—Fifty-eight members and friends journeyed to the valley of the Braid under the conductorship of Mr. J. Skillen. Slemish Mountain, a volcanic neck (1,437 feet), hallowed by the feet of St. Patrick, was the objective. A halt was made at the Moat of Dunfane (Dun-na-Feinne, the fort of the Fenians), a great mound about 30 feet high, and still surrounded in part by the original ditch and rampart and on the east by the remains of an extensive fortified earthwork. Further along the road Mr. Skillen pointed out a fine section of a huge esker deposit of glacial sands and gravels.

At Broughshane (the bru or border of Shane—viz., Shane O'Neill), a halt was made to inspect the two fine memorial windows of Celtic design in the Second Presbyterian Church. A visit was also paid to the grave of the Rev Canon Grainger, an original member of the Club, and its first chairman. On the main road from Ballymena to Glenarm, the Holy Well of Tubbernasool (Tober-na-suil, the well of the eyes), was pointed out in a boggy field on the south side of the road. This is the " fons miraculosus " of Colgan, to which more than a century ago pilgrimages were made, but all traces of its sacred use have disappeared.

The old Church of Skerry (Schirich, rocky), founded by St. Patrick himself, next came in sight. The ruins measure on the outside 69 ft. by 26 ft. The interior is filled to a considerable height by graves, an arch at the eastern end covering the tomb of the O'Neill family. In more modern times a farmer in this neighbourhood, one James M'Alschinder, or Alexander, introduced a variety of potatoes which became famous under the name of " Skerry blues." It is said he grew them from two potatoes found in a barrel of Dutch flax-seed.

From Mr. Montgomery's farm at the north-eastern base of Slemish the ascent of the mountain was commenced—the party was treading the footsteps of St. Patrick, who here spent seven years in captivity as a head-boy. The Saint's Chair, a natural cleft in the rock, was pointed out, and Mr. Skillen indicated the location, at the base of the hill, of " M'Cracken's Well," where Henry Joy M'Cracken and his men, on their retreat to Slemish after the Battle of Antrim, paved the mouth of the well with neatly-fitting stones which still remain intact.

On the return journey the stone circle and kistvaen at Ballymarlow were inspected. The discovery of these ancient remains by Mr. Skillen about 1908, created much interest in archæological circles on account of

certain unique features which they possess. At Ballymena the party had tea in Whiteside's Hotel. This was followed by a short business meeting, the Rev. W. R. Megaw, B.A., in the absence of the President, occupying the chair, when 17 ordinary and three junior members were elected.

The only stop on the journey home *via* Kells, Connor, and Parkgate, was at Kells to visit the remains of the old Abbey. Only the western gable is left standing. Close by is the desecrated tomb of the O'Haras, now apparently used as a fowl-house!

Throughout the excursion a keen look-out was kept for that extremely local land-shell (in North Ireland) *Helix hortensis*, known to occur in the Braid Valley, but no specimens were found.

JUNE 30.—EXCURSION TO MONLOUGH AND TULLYGIRVAN GLEN.—Over thirty members and friends, under the leadership of the President travelled by motor coach to the shores of Monlough. Owing to the recent spell of dry weather, the drains had practically dried up, which prevented any work being done at the freshwater fauna. Among the marsh-loving plants observed were the Marsh Cinquefoil (*Comarum palustre*), Marsh Speedwell (*Veronica scutellata*), and several interesting sedges, including *Carex vesicaria* and *C. ampullacea*. Of the birds seen may be mentioned the Snipe, Wild Duck, Teal, Reed Bunting, and Stonechat. A Snipe's nest was found containing four eggs; also that of a Common Sandpiper, which had only empty egg-shells, the young birds having departed. A young Lapwing, still unable to fly, was seen moving along the edge of the lake, while a quiet "plop" in the water betrayed the presence of a Little Grebe, whose nest was afterwards found.

On reaching the end of the lake the party were conducted to the home of Mr. J. McWilliams, where an alfresco tea was provided, at the close of which thanks were accorded to the host and hostess for their extreme kindness. The next part of the journey was through Tullygirvan Glen, under the guidance of Mr. McWilliams. By the side of the lakelet at the head of the Glen the Least Marshwort (*Helosciadium inundatum*) was found in quantity. A walk of about a mile from the Glen brought the party to Ballygowan station, from which the homeward journey was made.

ROYAL ZOOLOGICAL SOCIETY.

Some very valuable additions have lately been made to the Society's collection of animals, which are now particularly well worth a visit.

Recent gifts include two beautiful Leopard cubs, presented by Professor A. F. Dixon; three Fallow Deer fawns, given by the Board of Works; a Bonnet Monkey from Mr. A. H. McLean; a Pelican from Mr. H. E. Rogers, and a pair of Purple-backed Starlings (Rose-coloured Pastor) given by Mr. G. E. Low. Foxes have been presented by Messrs. Johnston, Gilmore, and Wilson Lynch; also two examples of the Irish

Stoat (*Mustela hibernicus*) by Mr. Higginbotham, a Hedgehog by Mr. McHickey; a Sparrow-hawk by Mr. C. H. Blackham, two Magpies by Mr. W. F. Williams, and an Irish Slug (*Geomalacus maculosus*) by Miss Delap, Valentia.

By purchase the Gardens have also acquired some very attractive animals—notably a four-year old Dromedary, a two-year old Chimpanzee, a young Brown Bear, two young Malay Bears, a Ring-tailed Coati-Mundi, and a pair of Marabou Storks. Other purchases include a number of Guinea-pigs, and several interesting fishes—the King Carp, Green Tench, Golden Orfe or Ide (*Leuciscus idus*), Bitterling (*Rhodeus amarus*), and Catfish (*Amiurus catus*)—also the somewhat celebrated "Roman Snail" (*Helix pomatia*).

A young Woodward's Kangaroo has been born, and some young Peafowl hatched in the Gardens. Animals received on deposit or approval include two Yellow Baboons, ten Rhesus Monkeys, a Patas Monkey, a Green Monkey, two Ring-tailed Coatis, and three Razor-billed Curassows. It is satisfactory to know that public interest in the Gardens appears to be increasing.

ROYAL IRISH ACADEMY FAUNA AND FLORA COMMITTEE.

It is of hopeful augury for the progress of scientific work in this country that the Fauna and Flora Committee of the Royal Irish Academy, which in past years did so much for the advancement of zoological and botanical study, finds itself in a position to resume its activities, and that grants are again available for the furtherance of work in the many departments of the natural history of Ireland that still call for closer investigation.

This resumption was inaugurated by a meeting of the Committee held in the Academy House on the 13th of June, Mr. A. R. Nichols in the Chair. The subjects reported upon included Mr. Halbert's work at the Hemiptera and freshwater mites, in connection especially with his exploration of the Slaney and the south-eastern part of Ireland generally; the progress of Miss Knowles's nearly completed work at the Lichens, on which her report is in course of preparation; a report by Mr. Nichols on the Polyzoa, and the preparation by Mr. Stelfox of a full list of the Aculeate Hymenoptera (ants, bees, and wasps) of this country.

A resolution unanimously passed requested Dr. Carpenter (now resident in Manchester) to allow his name to be retained in the list of members. The full committee, as at present constituted, consists of Dr. G. H. Carpenter, Dr. Bronté Gatenby, C. B. Moffat, A. R. Nichols, Denis Pack-Beresford, Dr. G. H. Pethybridge, Dr. R. Lloyd Praeger, Dr. R. F. Scharff, and A. W. Stelfox.

NOTES.

ZOOLOGY.

Variation in Size of Eggs of the Little Tern.

With reference to Mr. F. W. Jeffers' note (p. 52 *ante*), fifteen eggs of this species which I had opportunity of measuring were fairly uniform in size, ranging from 1·24 inch—1·3 inch in length by ·9 inch—·97 inch in breadth—averaging 1·264 inch by ·939 inch. When on the Clare Island Survey in company with the late R. J. Ussher, we found 25 nests of this species on an island—merely a sandy spit at high tide—in Clew Bay (R.I.A. *Proc.*, vol. xxxi, Sect. 2, p. 40). Most of these nests contained from 1 to 3 eggs, but none of them were taken nor measured. My recollection, however, is that they all appeared of normal size. I possess two eggs, taken in Co. Down, which measure 1·5 inch by 1·05 inch and 1·44 inch by 1 inch, respectively. These were submitted to the late H. E. Dresser, who was of opinion that they were abnormal eggs of the Arctic Tern, the eggs of which average about 1·6 inch by 1 inch.

NEVIN H. FOSTER.

Hillsborough, Co. Down.

Swifts in May, 1923.

The Swift was first observed here this year on 3rd May, when about 8 were observed, but during the next few days there were further arrivals till the number reached about 40–50. In the following week arctic conditions prevailed and continued for a fortnight. This caused an almost disappearance of the Swifts—some days none were seen, generally 2 or 3 were on the wing, and one evening 7 were observed. With the advent of the fourth week, weather conditions improved, and gradually the number of Swifts increased, though I consider that there are now, 3rd June, barely as many as were present about the beginning of second week in May. I think this cold snap with biting northerly winds was general in Ireland during this period, and wonder if a like disappearance of Swifts has been noticed in other districts.

NEVIN H. FOSTER.

Hillsburgh, Co. Down.

I noticed a very similar disappearance of most of the Swifts in Dublin from May 9th to 16th, after their arrival in force on the 3rd, and a like diminution in numbers was observed by one of my brothers in Liverpool about same time. I suspect the birds do ze away a good part of the cold weather in their sleeping holes, but some further notes from other observers would be of interest.

C. B. MOFFAT.

Dublin.

The Malahide Tern Colony.

It may interest some readers of the *Irish Naturalist* to know that the current number of "British Birds" contains an article of mine on the Malahide Tern colony in Co. Dublin.

While we know from the *Natural History of Ireland* (1851), vol. iii., that Thompson recorded the breeding of the Little Tern (*Sterna a. albifrons*) in 1840, the Common Tern (*S. hirundo*) in 1837, and possibly the Arctic Tern (*S. paradisæa*), on the Malahide shore, attention is drawn to the fact that the sandbank forming the present side of the colony did not exist at that time. This is clearly shewn by a diagram of the main bank prepared from the 6-inch Ordnance maps of 1837 and 1909. The earliest breeding record of any of the larger species of Terns on the present site appears to be that of a pair of Common Terns in 1890 (Ussher & Warren's *Birds of Ireland*, p. 320). Some further records from 1900 onward are also given.

Amongst other items of interest contained in the article is the first announcement in print that Malahide was the scene of the writer's discovery of the breeding of the Roseate Tern (*S.s. dougalli*) in 1913, recorded *British Birds*, vol. vii., and *Irish Naturalist*, 1914. Some particulars are also given of an attempt made to breed there by three pairs of Sandwich Terns (*S.s. sandvicensis*) in 1922.

In addition, extracts from notes of visits made to the colony in the years 1915, 1919, 1920, 1921 and 1922 are appended, and in conclusion some comments are made on the behaviour of the birds prior to the 26th June, 1922, when, as many readers will be aware, the terns abandoned the breeding ground, leaving their eggs to the mercy of the marauding Gulls, Rooks, etc., as reported by Lt.-Col. H. A. F. Magrath in the *Irish Times* about that time, and in *British Birds* (vol. xvi., pp. 168-170).

Dublin. GEO. R. HUMPHREYS.

Helicella itala L.: an addition to the Fauna of Lambay.

When visiting this island on 27th June, I found a semi-fossil example of this shell in a sandy deposit of no great age on the cliffs between Carnoon and Talbot's Bays, and I have but little doubt that it still lives in the same neighbourhood though time prevented my searching for it on that occasion. This species was not taken on Lambay during the survey of the island—1904-6. [1]

A. W. STELFOX.

Rathgar.

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[1] See *Irish Naturalist*, vol. xvi., p. 41, 1907.

BOTANY.

Rubia peregrina L. and Tragopogon porrifolius L. on Lambay.

Behind the cottages at the harbour on 27th June I noted a colony of Salsify (*Tragopogon porrifolius*) which is possibly of garden origin, but which will probably succeed in establishing itself on Lambay.

Although frequent on the railways about Belfast, this alien does not seem to have been noted in Co. Dublin.

The Wild Madder (*Rubia peregrina*) being, unlike the Salsify, a native plant, there is more satisfaction in recording it also from the island, where I found it growing in some quantity on the clay cliffs between Carnoon Bay and Talbot's Bay. In Cybele II. this plant is stated to be very rare in eastern Ireland, and it has not, I believe hitherto been recorded from any station N. of Howth. That it should have escaped detection during the various surveys that have been made of the flora of Lambay is just one more example of those curious puzzles that naturalists are constantly encountering.

A. W. Stelfox.

Rathgar.

The Golden Samphire near Rush, Co. Dublin.

On 16th June last, while examining the coast north of Rush with Miss M. C. Knowles, we found a single fine clump of this plant, *Inula crithmoides*, on the cliffs in the first bay north of Rush harbour.

It does not appear hitherto to have been observed in or recorded from Colgan's division 2 of Co. Dublin. Moreover, this station is a little to the north of Lambay, long known as its most northern habitat in Ireland. As the sea has made considerable inroads in recent years close to where the plant grows at Rush, it may be that this is the last surviving member of a colony. On the other hand it may be derived from a sea-borne seed from Lambay or Howth.

A. W. Stelfox.

Rathgar.

ALGAL DISCOLOURATION OF LOUGH NEAGH AND THE RIVER BANN.

BY DENIS R. PACK-BERESFORD, M.R.I.A.

GREAT interest has been taken during this spring and summer by residents in the neighbourhood of Lough Neagh and the River Bann, and there has been some correspondence in the Belfast papers, on the discolouration of the lough and river. The curious and quite unusual colour of the water was first noticed about January or February last, so far as I have been able to ascertain, and began after the river was in flood. Instead of clearing in the normal way it gradually assumed a greenish hue, and eventually a greenish grey colour which lasted for months, and it was still of the same peculiar colour when I first saw it towards the end of May. One old man I met on the banks of the river told me he believed that a "volcano" had burst in Lough Neagh as the river had never been seen this colour before in the memory of the oldest inhabitant.

I at once got a glass of water out of the river to study, and found it was perfectly clear with no signs of mud in it at all, but on examining it with a pocket lens I found it to be full of very minute floating hairs which were evidently an alga of some sort. I put the glass of water to stand in the sun, and in the course of a few days several cotton wool-like tufts began to appear in it, this evidently being the plant growing.

About the middle of June I took some of this water over to London and to the Natural History Museum, where Miss Lorrain Smith and Mr. Gepp very kindly examined it for me and pronounced it to be an alga known as *Oscillatoria tenuis*, Agardh.

They referred me to Cooke's British Fresh-water Algæ where this plant is described as *Oscillatoria aerugescens* Hass, but told me that this is now recognised to be a synonym for *O. tenuis*.

Cooke after describing the plant, refers to Dr. Drummond's account of his discovery of it in Ireland, which is so interesting, and so exactly corresponds with my own observations that I think it is worth quoting in full.

" This is the species which Dr. Drummond described as the " colouring substance of Glasslough Lake, Ireland."

" He commences by stating that " Glas-lough " signifies " green lake " an appellation given to it from time immemorial on account of the hue of its waters, which exhibit a green tinge, equal to, or exceeding in intensity that of the sea, though it is not at all times equally striking.

" From the accounts I received, the green colour is evident in the lough throughout the year, and if I may judge from my own observations every drop of it is impregnated with the oscillatory filaments." " When a little of the water is lifted in the hand it seems to be perfectly transparent, and it appears equally clear at the edges of the lake, but at a depth of two feet the bottom is indistinguishable and the water presents a feculent opacity, accompanied by a dull dirty greenish hue. On lifting some of this in a glass it seems at first sight quite transparent but on holding it up to the light inumerable minute flocculi are seen floating through every part of it and producing a mottled cloudiness throughout the whole."

" At first I could only find the plant diffused through the water, but at length I discovered a wet ditch extending from the lake into an adjoining field, and there it appeared swimming on the surface in large masses, several inches in thickness and about a foot and a half in length. These seemed evidently to be produced by an agglomeration of the filaments floated in from the lake, matted together at the surface and increased in growth.

" The surface of these masses, where dried by the contact of the air, was of a bright bluish verdigris hue, while the parts immersed in the water were of a dull opaque green.

" On examining specimens in the microscope I sometimes observed their motions to be very vivid, and in other instances little or no motion could be perceived.

" They are extremely minute, their traverse striæ very

numerous and at distances of about half the diameter from each other. The filaments in the conglomerated masses appeared to me to be many inches long and running parallel together ; the broken fragments dispersed through the lake cross each other in all directions." Drummond : *Ann. & Mag. of Nat. Hist.* (1838), I p. 1.

I need only add that on my return to the River Bann early in July the river was nearly its normal colour, but on again examining some of the water under a lens it was found still to contain considerable numbers of the floating filaments but in greatly reduced numbers.

Fenagh House, Bagenalstown.

THE PEARL-BORDERED FRITILLARY IN IRELAND.

BY R. A. PHILLIPS, M.R.I.A.

On a bright day in June last Mr. H. Fogerty and I, while passing along a rocky roadway in the limestone cragland at Clooncoose near Kilfenora, Co. Clare, noticed large numbers of a pretty butterfly flitting about in the sunshine. We captured one but were at the time unable to identify it. The specimen was subsequently sent to Mr. A. W. Stelfox, of the National Museum, Dublin, who reported that it was the Pearl-bordered Fritillary (*Argynnis Euphrosyne*, L.) a species not previously known to inhabit Ireland.

In Great Britain this is one of the commonest of the Fritillaries, being widely distributed throughout England, most abundantly in the south, and ranging to the north of Scotland ; its discovery so far west in Ireland is, therefore, interesting and its apparent absence from, or rarity in, other parts of the country remarkable.

The late Edwin Birchall in his list of the Lepidoptera of Ireland (published in 1866) expressed a confident expectation that this species would eventually be found in the country, and its discovery nearly sixty years afterwards in Clare

quite justifies his prediction. The fact of it having escaped detection for so long a time leads one to think that its Irish distribution must be strangely local for a butterfly so common in England.

Clooncoose is situated in the barony of Burren, a district well known to naturalists for its immense tracts of limestone mountain, crag and "pavement," interspersed with patches of dense scrub and rich pasture, and its remarkable fauna and flora.

Other butterflies seen in the locality at the time were, the Orange-tip (*Euchloë cardamines*), the Speckled Wood (*Pararge egeria*), the Meadow Brown (*Epinephile janira*), the Small Heath (*Cœnonympha pamphilus*), the Little Blue (*Zizera minima*), and the Common Blue (*Lycæna icarus*); but these were all outnumbered by the Pearl-bordered Fritillary.

The captured specimen of *Argynnis Euphrosyne* is now preserved in the National Museum.

Cork.

IRISH SOCIETIES.

DUBLIN NATURALISTS' FIELD CLUB.

November 9, 1922.—J. de W. Hinch (Vice-President) in the Chair. The evening was devoted to exhibits, among which were an interesting series illustrative of the character of ice action during the Glacial Age, shown by the Vice-President; also a number of Irish birds shown by W. R. Brambell; leaves of various Poplars showing variation in autumnal colouring by C. B. Moffat, and some Tree-Frogs and Japanese Toads by Miss E. Wilson. A short discussion took place on each set of exhibits.

December 14.—The Vice-President in the Chair. A paper was read by Athole Harrison, on the nesting habits of the commoner Irish Gulls, and was followed by an informal discussion in which many members took part. Nominations for Officers and Committee for the ensuing session were read out in accordance with Rule VIII.

January 11, 1923.—Annual General Meeting.—The Vice-President in the Chair. The annual report and statement of accounts for 1922 were submitted and adopted. The Officers for the preceding session were declared to have been re-elected, and the three vacancies in the Committee were filled by the election of Miss Cooper, A. W. Stelfox and M. J. Gorman. Dr. Carpenter, the news of whose retirement from Dublin had been

received with deep regret, was unanimously elected an honorary member of the Club. C. B. Moffat read a paper on the study of wild plants (since printed in this Journal, pp. 21–7).

FEBRUARY 8.—C. B. Moffat in the Chair. The Vice-President (J. de W. Hinch) opened a discussion on Professor Wegener's theory of the causes of the present distribution of land and water, illustrating with the help of a series of diagrams and maps the nature of the movements that are supposed to have taken place. The discussion was continued by A. W. Stelfox, R. Ll. Praeger, and others, and the general sense of the meeting seemed favourable to the acceptance of Professor Wegener's view.

MARCH 8.—The President in the Chair. A paper of exceptional interest, illustrated with many excellent lantern-slides, was read by Miss Gilmore, B.Sc., on the Coal-Bore at Washing Bay, Lough Neagh—a paper which showed that the costly boring operations, though unsuccessful as regards their direct objective, had yielded results of an extraordinary value from the palaeobotanical point of view, while revealing a depth of clay (1,196 feet) before the basalt was reached that entirely confounded previous speculations. Messrs. Hinch, Praeger, Stelfox and others discussed the subject and joined in thanking Miss Gilmore for her paper.

APRIL 2.—The President in the Chair. The winter session closed with an address delivered by Mr. Gorman on "Some Fungus Galls." The lecturer, who showed a series of interesting slides, pointed out the various ways in which fungi obtain their food, and the diversity of the effects produced on the living organisms that many of them select as their hosts. Among the gall-formations shown, the conspicuous "witch knots" so often seen on the Birch, Silver-Fir, Lime and other trees excited a special interest. Discussion was limited to the asking of a number of questions, to which the lecturer replied.

MAY 5.—EXCURSION TO KILBRIDE VALLEY AND BALLINASCORNEY GAP.—Taking the steam tram to Brittas a party of about 20 members and visitors walked through the Kilbride Valley, and crossing Ballinascorney Gap descended into Glenasmole. The chief concern of the excursion was an examination of the mounds and sheets of gravelly drift which are strongly developed in this area and the main features of which were pointed out by the Conductor, J. de W. Hinch, who also explained the geological conditions which led to their origin. In late Glacial times a series of lakes of considerable extent had been formed along the eastern, northern, and western flanks of the Dublin and Wicklow hills, caused by the impounding of the drainage between the mountain slopes and the edges of the retreating ice-sheet. Into these lakes debris derived from the boulder clay on the mountain side and from the moraine material contained in the waning ice-sheet was deposited and spread out in sheets along the edges of the lakes. The composition of the gravels shows clearly the mingling of materials derived from very different sources, and pebbles of Chalk, Ailsa Craig rock, chalk flints, and shell fragments from the north are mixed with Leinster granite and Carboniferous limestone from the immediate neighbourhood. The system of overflow channels, represented at the present time by the "dry gaps" of the Dublin and

Wicklow Hills, was indicated and their mode of origin explained. As the impounded waters rose in the temporary lakes, a point was reached when the surface of the lake attained the same level as the col between two hills, and the waters of the lake, flowing outwards across the col commenced to cut an overflow channel These overflow channels have been traced along the eastern, northern, and western slopes of the Dublin and Wicklow hills from The Deputies' Pass near Rathdrum on the east to Hollywood Glen near Ballymore Eustace on the western edge of the Wicklow hills.

A NEW IRISH FIELD CLUB.

It is a pleasing duty to welcome the formation of a new Naturalists' Field Club in Northern Ireland, taking its name from that most interesting area of north Antrim anciently (and still) known as THE ROUTE. The starting of this Club as the result of geological lectures given last winter in Coleraine, Bushmills, and Ballycastle, by Professor J. K. Charlesworth, D. Sc., of the Queen's University, Belfast, recalls the fact that the Belfast Naturalists' Field Club (to which the Route Club is affiliated) had a somewhat similar origin, as a result of natural history lectures, given by the late Professor Ralph Tate in the early sixties of last century. The Club has for its first President the Hon. Helen Macnaghten of Runkerry; its Hon. Secretary and Treasurer is the Rev. E. M. Gumley, B.A., Rector of Ballintoy.

NOTES.

ZOOLOGY.

Comparison of Eggs and Down of Pochard and Tufted Duck.

I had recently the opportunity of comparing clutches of eggs with down of Pochard from England and Tufted Duck taken in May of this year in Co. Tyrone. The 8 Pochard's eggs were of a clear greenish colour giving an average measurement of 2·3175 x 1·66 inches. The eggs of the Tufted Duck were darker in colour—olive green—and more glossy in texture with a greasy look, and measured slightly less, viz. 2·315 x 1·613 inches. The general appearance of the downs was very similar, but seen in certain lights that of the Pochard was browner than the sooty down of the Tufted Duck. The feel of the downs, however, was decidedly different, that of the Tufted Duck being harsh whilst the Pochard's down was remarkably soft. The feathers in the down proved strikingly different, these from the Tufted Duck being of two types—(*a*) altogether silvery white and (*b*) brown with silvery white tips. The few feathers among the Pochard's down were much larger of sooty brown colour, one or two of them having lighter coloured tips.

NEVEN H. FOSTER.

Hillsborough, Co. Down.

The American Grey Squirrel in Ireland.

In the course of an enquiry into the present distribution of this alien species (*Neosciurus carolinensis*) in the British Isles, I have learned that there is one established colony, at any rate, in Ireland. This is at Castle Forbes, County Longford, where the Earl of Granard, about twelve years ago, received some dozen Grey Squirrels from the stock at Woburn, Bedfordshire, and since then they have increased so greatly as to become a pest. About four years ago over three hundred were killed in the course of the year, but the difficulty of having fire-arms in Ireland at present renews the squirrel's chances. It has spread from Castle Forbes to places over ten miles away, passing on its journey some miles of bog, without a single tree. Mr. Oldfield Thomas, F.R.S., has kindly placed the above information, communicated to him recently by the Earl of Granard, at my disposal.

Hugh Boyd Watt.

London.

Arrival of Spring Migrants in 1923.

The time of arrival of spring migrants this year was on the whole about the average dates for this district as published in *Irish Naturalist*, vol. xxvi, p. 123. The Whitetroat was observed in numbers on 6th May —only a couple of days late. The Chiffchaff is one of three species which arrived in advance of average time, being noted on 28th March, Rev. R. N. Morrison's note (p. 51, *ante*), constitutes it is believed the earliest record for this bird in Northern Ireland, his observation being made about 11 miles from here. The Willow-Wren was not seen till 26th April, almost a fortnight later than average. Of the Sedge-Warbler and Grasshopper Warbler no information is available for this year. The Spotted Flycatcher was somewhat late not being observed till 19th May. The Swallow on 16th April, was only a few days late, but the House-Martin seen on same date (and almost daily thereafter) proved nearly three weeks earlier than normal. Sand-Martins were present at their nesting haunts in considerable numbers in the last week of April, but the date of their arrival was not ascertained. The Swift first appeared on the 3rd May ; the Cuckoo on 23rd April ; the Landrail on 29th April ; and the Common Sandpiper on 4th May,—all about the expected dates. All the spring migrants appear to be here in about their wonted numbers except the Cuckoo, which has proved exceptionally scarce this year, and indeed was seldom seen or heard after the cold snap during the second and third weeks in May. Two or three Common Terns (probably non-breeding birds) generally frequent the lakes here from May till August, but this year none were observed.

Nevin H. Foster.

Hillsborough, Co. Down.

The Fox in Co. Down.

When visiting my friend Rev. R. N. Morrison, he informed me that a Fox had been seen on the road at the entrance gate to his Rectory (Magherahamlet, near Ballynahinch). This is not surprising as these animals are not uncommon in the Deer Park situated only about a couple of miles away from his house. Some Foxes are still to be found in the Mourne Mountains.

Hillsborough, Co Down. NEVIN H. FOSTER.

BOTANY.

Down and Antrim Plants.

A few notes of hitherto unrecorded stations for some of our rarer Down and Antrim plants may be of interest.

Geranium columbinum, on railway between Dundrum and Newcastle.

Hypericum elodes, at Ballyalloley.

Vicia lathyroides, top of the keep at Dundrum Castle.

Eleocharis multicaulis, at the Giant's Causeway, and at Ballyalloley.

Chenopodium Bonus-Henricus, at Cregeagh.

Carex teretiuscula and *Rhynchospora alba*, at Sharvogue's Bog: also *Salix purpurea* growing with *S. cinerea*, surely wild in such a situation.

Ophrys apifera at Magheramorne. This is I believe the first record of the Bee Orchid in our three N. E. Counties.

Campbell College, Belfast. CORRIE D. CHASE.

Notes from Cos. Down and Armagh.

While searching the meadows near Ellis's Cut, for Spiranthes, where the Lagan Canal enters Lough Neagh, on 1st August, 1922, I observed the following plants, two of which are additions to the flora of Down as listed in the *Flora of N E. Ireland*, and its supplements. West of the canal, in Co. Armagh, *Lathyrus palustris*, *Typha angustifolia* and *Calamagrostis stricta*, var. *Hookeri* are still abundant in Praeger's station.

North of the canal mouth in Co. Down, on the shore of the lough there is quite a large area of the usual scrub, so characteristic of the steeper parts of the eastern shores of Lough Neagh. In this scrub I found fine trees of *Rhamnus catharticus* and not far away I got *Chærophyllum temulum* in a hedge close to Annaghdroghal House. I have no doubt the record given in Cybele I for *Rhamnus catharticus*—a little north of the Lagan canal—refers to the present station for the plant, though transferred to Co. Antrim in the Flora of the North-east. A few days later I found *Typha angustifolia* in a new station, in the old gravel pit by the railway near Herdstown, west of Donaghadee, where *Typha latifolia* also grows, as well as fine specimens of *Orchis prætermissa* Druce. I also observed *Trifolium medium* on the basalt and tip about the quarries in Scrabo—a rare plant in Co. Down.

Rathgar. A. W. STELFOX.

IRELAND AND SWITZERLAND: A BOTANICAL CONTRAST.

By R. Lloyd Praeger, D.Sc.

Recently I had an opportunity of studying the flora of Switzerland under peculiarly favourable circumstances. In the first place, I was one of a party of some 33 botanists, representing seventeen different nationalities, so that we had the advantage, as we went along, of comments from many view-points; and secondly, we were for over three weeks conducted from end to end of the country by the leading local botanists: we were taken straight from best place to best place, and saw as much on one visit as most people see on half a dozen. It may be of interest to attempt to draw some comparisons between the vegetation of Switzerland and that of our own island.

As regards the general flora of the two areas, it may be said that Switzerland possesses the great bulk of the flora of which Ireland possesses only a part. Owing to its central position in Europe and the great variety of conditions, both edaphic and climatic, which prevail there, Switzerland has received and retained much of the successive plant-waves which have entered Europe from the greater land masses which lie to the eastward. These waves beat strongly across Central Europe, but diminished westward, as species after species dropped out owing to competition or to the intervention of barriers which arrested their progress: so that England has received a diminished immigration, and Ireland a more diminished one. This general east-to-west migration has been going on for a very long time. The researches of Clement Reid and Mrs. Reid go to show that during Pliocene times a flora largely exotic was by degrees replaced in Europe by one closely allied to that now existing, and derived no doubt mainly from the Asiatic highlands. Then came the Ice Age, causing dire confusion in all our records, geological, botanical and zoological. In Central Europe the existing temperate

vegetation was driven southward towards the Mediterranean and its place taken by plants of the north. In Ireland the case is not so simple, for the plants had not an open line of retreat southward, since there lay the Atlantic. The argument for the survival in Ireland of at least part of the flora, based upon our interesting Lusitanian, Mediterranean and North American plants, is well known, and need not detain us here. There is a tendency now among geologists to allow us what they formerly denied us—a high land-level persist ng after the ice had passed away. If this were of sufficient amount and duration, it might have allowed of post-glacial immigration of our southern plants (and the associated animals) ; but it cannot be extended to allow of the overland migration of the American element, for which a pre-glacial date still appears essential. My friend Dr. Stapf, who follows Engler in believing in the post-glacial arrival of our southern forms,[1] agrees (in a recent conversation) that the American element would appear to be of pre-glacial arrival.

On the retreat of the ice, Switzerland became readily re-colonized by much of its former vegetation, and no doubt its mountain flora was permanently reinforced by many arctic species which had been forced southward. Ireland similarly became re-colonized, in this case from the eastward, so that the net result of the glacial upset is in both countries a flora differing probably not much in type, though somewhat in composition, from that prevailing just before the oncoming of the Pleistocene cold. Ireland s still occupied by a flora which is in the main a reduced Swiss one. But the reduction is very great. Where Ireland has 12 Trefoils, Great Britain has 18, Switzerland 24. Ireland has 3 species of Gentian, Great Britain 5, Switzerland 20. Of Phyteuma Ireland has none, England 2, Switzerland 10. And so on, till the odds in favour of Switzerland run into four figures, though its area is only half that of Ireland. On the other side of the account, we can point only to our Lusitanian-American group, and

[1] Otto Stapf ; The Southern Element in the British Flora. Englers Bot. Jahrbücher **50** (1914) 509.

also to a number of "Atlantic Type" plants of wide range in western Europe, but which do not grow so far eastward as Switzerland. These include some of our most abundant and showy species, such as the Purple Heather (*Erica cinerea*) and Common Gorse (*Ulex europæus*). I sometimes think that we do not quite appreciate the unique beauty of these two plants in our landscape. The famous alpine meadows present a far greater *variety* of colour and form in their flowers, but for sheer overwhelming mass of colour our Gorse and Heather are unsurpassed in Europe, and so far as I know, in the world. What is more surprising is that even in its own special domain of alpine plants we can occasionally beat Switzerland, for nowhere there, so far as my knowledge goes, will we find such sheets of Mountain Avens (*Dryas octopetala*), Spring Gentian (*G. verna*) and Bearberry (*Arctostaphylos Uva-ursi*) as in the Burren of Clare.

Apart from its position, which is favourable to large immigration, the variety of conditions offered by Switzerland as compared with Ireland easily accounts for a flora much larger than the Irish one, concentrated on an area only half as large. The deep Swiss valleys, such as those of the Rhone and Rhine, while cold in winter—often colder than the slopes overlooking them, I am informed—are generally hot and dry, and their flora is thermophytic and xerophytic. As we saw these valleys, the shade temperature ran up each day to 80°F or 90°F, and the hot rocks held a rich flora of succulent and other sun-loving plants which were shrivelling in the glare. Rising from the valleys the forest zone, composed of native trees, extends far up the hill-sides—Beech and other deciduous types below, Spruce, Larch, Scotch Fir, or Alpine Pine (*P. Cembra*) above, harbouring a rich woodland flora, and dying out at 5,000 to 7,000 feet into old gnarled single trees or a scrub of Mountain Pine or Alder (*A. viridis*). Above this stretches the grassy alpine zone, extending right up to the perennial snows, and gay with a glorious variety of lovely plants. In Ireland the hot valley zone is missing: the forest zone—which in our country normally descends to sea-level—is almost obliterated below by agriculture, and curtailed

above by westerly winds, and in any case so much interfered with that the forest flora is now very poor ; above this, we have in most places heavy peat, with its characteristic and very limited vegetation. On cliffs and along streamlets alone do we get any echo of the lovely alpine flora of Switzerland. As compared with Swiss conditions, our alpines have, it would seem, a very bad time. There they get a gloriously warm summer sun, and throughout the whole winter they are safely tucked away under the snow, comfortably dry and in a uniform temperature. With us they are, in winter, mostly fully exposed to the elements and have to endure incessant winds, soaking rain, and frequent thermometric changes. It seems no wonder that some of them have sought a refuge at low levels, where they escape some of the Irish weather.

And that brings us to a very interesting point about the Irish flora as compared with that of Switzerland, which is this : the Swiss alpines stick to the mountains, while in Ireland many of them are found at low levels. Of course the first part of this sentence does not apply strictly ; many alpine plants are brought down, especially by streams, and may be found in Switzerland at comparatively low levels. But these occurrences are exceptional and temporary ; in general the zone of the alpines is quite clearly defined. In Ireland, if we take the " Highland Type " of Watson as defining our alpine flora, we find that out of 34 representatives in our island (Hawkweeds excluded) eleven descend to sea-level, and eight more come down to 650 feet. Two-thirds of our alpine flora, in other words, descends to 650 feet or less, while at the other end only 13 of the 34 ascend above 2,600 feet. It is clear that were we classifying the Irish flora *de novo*, we would not include in the alpine group most of those Irish plants which in the Alps and other mountain areas are exclusively alpine. This is a puzzle of which no satisfactory solution has been found, nor have I one to offer. The interest of this feature is heightened by the fact, already mentioned, that some of the alpines which in Ireland find their greatest abundance and luxuriance at very low levels, are in the Alps quite typical high-level species. The Mountain Avens and Bearberry are

excellent examples. And to add to the Irish confusion, these low-level alpines grow mixed, as is well known, with the most marked southern plants in our flora—the famous *Neotinea intacta* of the Mediterranean, the Maidenhair Fern, Heaths from the Pyrenees, Arbutus, and so on. And on top of them all are our American immigrants, such as the Pipewort. But the old problem of the origin of these peculiar ingredients of the Irish flora does not arise at present : we may confine ourselves to the puzzle of the low-level alpines. I do not think that existing climatic or soil conditions will account for their immigration here, though they have allowed them to continue their tenure from some bygone time. I think these plants must be looked on as dwelling on the Burren rocks in spite of, not because of, their existing environment. Their whole European distribution, as well as their fossil history so far as it is known, point to their low-level Irish habitats as being quite abnormal—unnatural, if one may use the word for a purely natural phenomenon. It is to the past history of the West of Ireland that we must look for the key of the mystery ; and that history is still a closed book, which the history of the Swiss flora, even if it were fully known, would not help us fully to read.

To return to our comparison of the Irish and Swiss floras, it is interesting to note the relative effect of sun and wind in the two countries. In Switzerland one notices a very marked difference of vegetation, and especially of tree-growth, between northern and southern slopes. The Rhine valley furnishes a good example. The mountains on the south side of the Rheinthal are densely clothed with tall timber, while on the northern side, which faces the sun, the trees are thin and comparatively stunted, owing to lack of water in summer. No such result of northern or southern aspect can be seen in Ireland. On the other hand, eastern or western aspect makes all the difference with us, while in Switzerland it matters little. The west wind is in Ireland the most incisive of all the climatic factors. The eastern slopes of hills will bear timber where the western slopes are hopeless ; all over the country the trees have an eastward sag ; even in our

east coast gardens shelter from the west is a problem of first importance, the sea winds from the east being an insignificant factor in comparison. The mighty Atlantic spreads its hand far over our islands : even on the eastward slope of the Pennine chain in England the eastward stoop of the trees is noticeable. In Switzerland, whether on hills or plains, this effect does not make itself felt or noticeable. One sees it, it is true, in the deep valley of the Rhone before it debouches into the Lake of Geneva ; but there the valley runs N.W. and S.E., and the proximity of the great sheet of water enhances an effect that might not otherwise attract notice. Generally, on both hill and plain, on all aspects, the trees grow taller and straighter than we find in Ireland save in the most sheltered places, and this continues often up to 5,000 or even 6,000 feet.

As a final point of comparison, the lakes may be mentioned. The rivers from which the Swiss lakes derive their supplies are mostly either of wonderfully clear green water or of " gletscher milch " the milky grey water that tells of a source below a glacier. The river Inn, thus fed from the snows, colours the whole " blue Danube " in this way from its junction downwards, so that even at Vienna it is like grey soup. The lakes are effected by these two sources of supply, some being much clearer than others : many have an amazing blue or green clearness, quite unknown in Ireland, and none have the brown peat-derived colour of most of the Irish lakes. As regards their flora, here at last is a case where Ireland can hold her own against Switzerland. The rich aquatic vegetation of Irish rivers and lakes seems to exceed in quantity and in variety often to equal, that of the Swiss waters. The Swiss lakes are mostly deep with steep shores. Running along their margins in the train, one looks down into wonderfully clear water ; fish one sees in abundance, but often hardly a plant ; in shallower sheltered waters vegetation is much richer, but I saw nowhere (of course my observations were very limited) the equal of the subaquatic groves of some of our Irish waters. In variety too, our water-plants can hold their own. Of pondweeds, for instance, we have as many as Switzerland. The same seems to apply as regards

Water-Crowfoots, Bur-reeds, etc. But in most cases, of course, the main migration-stream has brought to Switzerland species which have not succeeded in battling their way across Europe to its most western outpost—Ireland.

Dublin.

IRISH SOCIETIES.

BELFAST NATURALISTS' FIELD CLUB.

JULY 21. EXCURSION TO LOUGHINISLAND.—About sixty members and visitors of the Club had a run by motor coach to Loughinisland and its three old churches, passing and inspecting on the way the fine dolmen (cromlech, so called in Ireland and Wales) at Annadorn, which was well "snap-shotted" by some of the party.

The conductor, Mr. S. M. Macoun, here called on a member to describe how a portion of the great capstone of the dolmen came to be blasted off many years ago, the blasted part going through the roof of the house occupied by the would-be destroyer who then ceased his operations. The members present considered it a pity the house suffered instead of himself.

Arriving at Loughinisland, the party scattered, the zoologists and botanists to the lake shore and the antiquaries to the three churches.

Mr. R. W. H. Blackwood, J.P., a club member, now joined the party and acted as local conductor for this area and Seaforde, giving much information about the history of the churches and parish generally.

Some large specimens of *Limnaea palustris* were collected on the lake shore, and a centrally keeled and typical *Planorbis carinatus*, very local in N.E. Ireland, those of the Lough Neagh basin being non-typical. The botanists found a specimen of the House-leek near the lake shore, and a patch of very tall Great Water-dock (*Rumex Hydrolapathum*), some plants of which measured over six feet high, with some leaves a yard long, the first of a number of very tall plants collected later in the day.

Leaving the demesne, the church, now 200 years old this year, was inspected, and the motors taken to Drumcaw cairn and cist, on the farm of Mr. S. Burke, J.P., who kindly described the stone-lined grave in the centre of the cairn—its contents, and urn, etc., which passed into the hands of late Canon Grainger, D.D.

Soon Clough Old Castle on its dun was passed on the way to Downpatrick, where the party were well looked after at Denver's Hotel, as on many visits during the last half-century. After tea a business meeting, with F. A. Heron, D.L., in the chair was held when twelve new members, nine senior and three junior, were elected, and votes of thanks passed to Mrs. Forde, Mr. Blackwood, and Mr. S. Burke.

Having an hour to spare before starting home, a visit was paid to the Cathedral and St. Patrick's grave, some of the lady members also visiting the old jail. The botanists found that the very rare plant *Galium Cruciata*, was still to be found on The Dun, and *Erinus alpinus* still flourishes on the jail wall.

AUGUST 11.—Over sixty members accompanied by a few friends, visited Carrickfergus district under the conductorship of T. E. Osborne and G. C. Reilly. Char-a-bancs were in waiting to convey them to Duncrue Fort neighbourhood. The adjoining ruins of Killyann Church, "the church by the river," were visited. Nothing remains of this ancient building except a portion of the west wall.

Returning to the road, the char-a-bancs were again mounted to bring the party to the "Commons Farm" Dining Hall for tea. Afterwards a short business meeting was held—R. S. Lepper, M.A., presiding in the absence of the President—when several new members were elected, and Mr. Robert Bell gave a brief address on the geological features of the Woodburn district, pointing out that as the river had cut out a deep channel below the level of the surrounding country, sections of the different geological strata of County Antrim were well exposed in turn.

By permission of the Belfast and District Water Commissioners their works were then visited.

From the lower entrance to the waterworks a short walk brought the party to Carrickfergus, where the Rector of St. Nicholas, the Rev. Canon M'Neice, M.A., B.D., gave a sketch of the history of the ancient town and Church.

SEPTEMBER 1.—A large party motored via Ballenure, Larne, and the Coast Road to Cushendun and Cushendall, returning via Glenariff and Ballymena. A most enjoyable day was spent and the well-known geological and botanical features of the district were seen to advantage. The great distance covered allowed very little time for field-work.

SEPTEMBER 15.—Meeting the conductors (R. Bell and R. J. Welch) at the County Down Railway terminus, the Field Club party, on arrival at Dundrum, were conducted to the pre-historic sites near the south end of the Inner Bay. Some flint scrapers rewarded the searchers, and the material collected contained, in addition to the flint finds, pieces of pottery, some ornamented, many pot boilers, stone hammers and two anvil stones; food shells were not abundant, and no well-formed arrowheads were found.

After tea many of the party climbed the hill to visit the old castle, which has the most perfect circular Norman keep in Ireland.

A short business meeting after tea, D. Elliott, B.A., in the chair, was held to elect seven senior and one junior members.

ROUTE NATURALISTS' FIELD CLUB.

JULY 14.—EXCURSION TO WHITEPARK BAY AND BALLINTOY.—Favoured by charming weather, the members of the newly-formed Club turned out in strength for their second excursion, and were reinforced by a small contingent of the B N.F.C., staying at Ballycastle, who brought up the total number to 25. The Hon. Sec. of the Club, Rev. E. M. Gumley, B.A., conducted.

Making their way down a gorge in the Chalk cliff below the school, where Mr. Gumley had thoughtfully provided a special ladder, the party reached a knoll commanding a wide view of the whole bay from the "Park-end" to Port Braddan, from which point R. J. Welch, of the Belfast Club, gave a concise description of the geological formation of the district. They then proceeded towards the west end of the bay, collecting on the way many botanical specimens.

Mr. Welch, in the course of his remarks, pointed out the main geological features of the area, the eastern termination of the great "fault" at Port Braddan, which throws down the basalts of Bengore Head against the Chalk of Whitepark. The position of the Lias clays with their many Ammonites and other fossils was shown with those curious volcanic intrusions, now worn by the sea into all sorts of marine sea stacks, such as the Elephant Rock and the Vista Arch. The low cliffs, where *Helix aspersa*, constantly hibernating in winter and aestivating in dry weather, has drilled deep holes in the hard Chalk, was also pointed out. Further along, the pointed hummock with its small prehistoric stone circle was seen.

Arrived at the famous Kitchen Middens, many interesting things were found, among them being pot-boilers, hammerstones, pieces of pottery showing attempts at ornamentation, and four good flint scrapers. These last named were the finds of a junior visitor from Belfast. The best finds were a beautiful, finely fluted, steep-nosed scraper, and the form known as a tooth scraper. With these were many bones of animals used for food, the marrow bones split as usual, and a good many fragments of the "short-fired" cooking vessels (not sun-baked as they are so often erroneously called), some of the fragments nicely ornamented with various patterns. The part of the dunes where landshells, collected by wind-action into "pockets" could be sieved out, was shown, and the proper sort of miller's gauze sieve (home made) useful for the purpose exhibited.

A move was now made to the Parochial Schools, where a very welcome cup of tea was dispensed by Mrs. Gumley, and books useful to beginners in natural history and prehistoric archaeology shown by a visitor; a special net for rock-pool and freshwater fauna collecting was also exhibited. The party proceeded to Mount Druid cromlech on the hill behind the rectory. Here a short talk was given by Mr. Welch on the nature of cromlechs in general and this one in particular. He gave good reasons for believing that it is the central chamber of what was once a small burial mound or cairn.

NOTES.

Rare Fishes in Irish Waters.

A specimen of the Belted Bonito (*Pelamys sarda*) was sent from Howth to the Ministry of Fisheries on July 27th, 1923, by Mr. A. King, Fisheries Officer. It had been taken the previous night in a herring net by the motor fishing boat "St. Veronica" of Arklow. The specimen was a female, 38 cm. in length, with ovaries well developed but not yet ripe. The ovarian eggs measured .4 mm. in diameter. In the stomach were some partially digested fish bones. *P. sarda* is not recorded by Day as an Irish fish, though it has several times been taken on the coasts of England and Scotland. Mr. A. R. Nichols, however, informs me that there are three specimens in the National Museum taken respectively at Courtmacsherry, Co. Cork, in August 1911, Carrigaloe, Co. Cork, in July, 1913, and Broadhaven, Co. Mayo, in July, 1915. Probably it has been taken more often than these records suggest, but has been mistaken for an extra large Mackerel. It is common in the Mediterranean and occurs on both sides of the North Atlantic and on the east side of the South Atlantic. It is said to reach a length of three feet, though most of the specimens recorded from the British coasts have been between one and two feet in length. The present specimen has been added to the Museum collection.

A few days later a specimen of the Opah (*Lamprys luna*) was received at the Ministry of Fisheries, having been forwarded by Mr. P. Donovan, of Wexford, who wrote that it swam right on to the beach at Rosslare and was captured. Its action recalls the capture of the specimen from Lambay recorded in the *Irish Naturalist* for 1916, p. 32, which was said to have struggled violently in shallow water, apparently determined to reach dry land. When the specimen arrived in Dublin, decomposition had already set in, but the brilliant orange-red colour of the fins and the mauve reflections and silvery spots on the body still gave evidence of its magnificent colouring when alive. It was a female, measuring 97.5 cm. in length, and, excluding the dorsal fin, 50 cm. in height. The ovary was spent but contained some residual crushed ova which when perfect would have measured about 2.5 mm. in diameter. In the stomach were found several cephalopod beaks. Miss A. L. Massy has been good enough to examine these and considers that they belong to two species of squids, one represented by a large pair of mandibles and the other by seven upper and four lower mandibles. They cannot be referred to any of the species commonly found in the Irish Sea, and were probably the remains of a meal which the Opah had had before it reached our waters.

The Opah appears to be an inhabitant of the Gulf Stream. There are several records from the British and Irish coasts. Day mentions seven Irish specimens as having been taken between 1835 and 1851, and there are in the National Museum, besides the Lambay specimen, two casts of fish from Galway and Wexford. It also visits the coasts of Norway almost every year, evidently following the shoals of the squid *Ommatostreptus*

sagittatus, the beaks of which, according to the Norwegian naturalist Collett, are frequently found in its stomach. This cephalopod is a pelagic form and may often be seen at the surface by night, fifty miles or so off the west coast of Ireland, probably on its northern migration. It seems likely that the specimens of the Opah which come ashore in the British Isles are individuals which in the course of their northerly migration have lost their way and wandered into shallow water of low salinity where their apparent helplessness may be due to their unaccustomed surroundings.

Fisheries Office, Dublin. G. P. Farran.

The Pearl-bordered Fritillary.

Mr. R. A. Phillips is to be congratulated in adding *Argynnis Euphrosyne* to the list of Irish butterflies. From the fact that it has been overlooked for so long, it does not necessarily follow that its Irish distribution must be very local, when one considers that the late Mr. Wm. F. de V. Kane worked and investigated the lepidoptera in the neighbourhood of Favour Royal in this county for many years, and yet passed over *Melitæa aurinia*, which has since been found in the locality. The chance discovery of the larvae of this species on the Erris peninsula, Co. Mayo, was responsible for the addition of this local little butterfly to the county list.

Stewartstown. Thomas Greer.

Aster laevis at Lough Neagh, Co. Tyrone.

A few years ago I observed this plant sparingly in the marshy meadows which fringe the western shore of the lough for miles. Last month accompanied by my friend Dr. R. J. Spencer, when searching for *Spiranthes Romanzoffiana*, we found large masses of the Aster in full bloom, and extending along the shore for over half a mile, and also on some of the small islets in the lough. Other plants found at the same time were *Ranunculus Flammula* and *Epilobium angustifolium*, the latter plentiful in meadows reclaimed from the bog.

Stewartstown. Thomas Greer.

Beech Fern in Co. Cavan.

On 24th June last I found *Polypodium Phegopteris* in considerable quantity within a limited area at Bruce Hill, Co. Cavan, 600 feet elevation.

Dundee. G. G. Blackwood.

REVIEW.

The North-eastern Flora.

A Second Supplement to, and Summary of Stewart and Corry's Flora of the North-east of Ireland. Compiled by Sylvanus Wear, with an Introduction by R. Lloyd Praeger. 8vo. pp. xii + 129. Belfast: W. Erskine Mayne, 1923. 5s. 6d. net.

This publication is designed to give at a glance a view of the north-eastern flora and its distribution within the counties of Down, Antrim and Londonderry, and at the same time to provide detailed information relative to additions to the flora and additional stations of the rarer species, made since the publication of the 1895 "Supplement" of Stewart and Praeger, which carried on the story of local floristic research from the date of the original "Flora" (1888).

The present compilation is due to the industry of Sylvanus Wear, who died within a week of completing the MS. It shows that knowledge of the north-eastern flora has advanced steadily. A good many plants have been added to the flora, and what is equally important, a good many of the "missing" species of the first Supplement have been re-discovered in the district. Among these are some plants very local in Ireland, such as *Lathyrus palustris, Trifolium striatum, Pyrola secunda, Calamagrostis Epigejos.*

Of plants which the efforts of local botanists have not succeeded in re-finding, the most important are *Carex elongata, Polypodium Dryopteris* and *Pilularia globulifera.* These were among the many local discoveries of Dr. David Moore, the first and third belonging to the Lough Neagh flora, while the second was seen on Knocklayd near Ballycastle.

The work is embellished with photographs of Sylvanus Wear and other local botanists, and of *Spiranthes Romanzoffiana,* the most interesting species of the local flora.

OBITUARY.

Madame Christen.

We observe with regret an announcement of the death of Madame Christen (*née* Thompson) which took place at Llandudno on July 16th. As Miss Sydney Mary Thompson she was a well known and much appreciated member of the Belfast Naturalists' Field Club for many years. When, stimulated by the work of Prof. Percy Kendall, the Club organized, in 1893, research on the local glacial deposits, Miss Thompson undertook the Secretaryship of the Committee, and for six or seven years furnished reports in which a large body of useful observations were recorded, the tabulation of local erratics and their origin being a valuable piece of work. She served on the Committee of the Club for a number of years, and her departure from Belfast, consequent on her marriage to the artist Rodolphe Christen, left the Club poorer by the loss of one of its most active members.

THE LARVA OF A HYDROPHILID BEETLE, MEGASTERNUM BOLETOPHAGUM.

BY K. C. JOYCE PHILLIPS.

The larva described in this paper was found by Mr. James L. McWhinney, A.R.C.Sc.I., in the course of the investigation on the fauna of a pasture soil, in which he is engaged at the Albert Agricultural College, Glasnevin. For the purpose of this research, samples of soil are taken from a field in permanent pasture at intervals of a week or ten days, each sample being a nine-inch cube, which is divided into five horizontal layers, the topmost an inch, and the other four two inches in depth. The live animals found in each layer are counted and identified as far as possible, larval insects being kept for rearing; this is specially desirable in the case of larvæ of which no description appears to be available.

In the topmost layer of a sample taken on 6th February, 1922, two small unknown beetle-grubs were found. They were of a dirty pale brown colour, difficult to see in the soil when at rest, with large head and conspicuous asymmetrical mandibles, the remarkable appearance of which at once aroused curiosity. The larvæ moved forward at a steady rate, the mode of progression being quite distinct from that of a maggot. Similar larvæ were seen in most of the samples taken until May 22nd, and they were always found in the topmost layer, that is within an inch of the surface. Most of them, unfortunately, died, but two specimens pupated in May, and the adult beetles emerged on 18th June. Mr. J. N. Halbert, M.R.I.A., of the National Museum, kindly identified these as *Megasternum boletophagum* Marsh, one of the smaller Hydrophilidæ common in most parts of Ireland. Reference to Schiodte's great work on beetle-larvæ showed that a similar asymmetrical condition in the mandibles is characteristic of the allied *Cercyon analis* Payk.[1] As no larva belonging to the

[1] J. C. Schiodte: De Metamorphosi Eleutheratorum Observationes. *Naturh. Tidsskr.* (3) i., (1861), pp. 219-20, pl. vi., figs. 16-25.

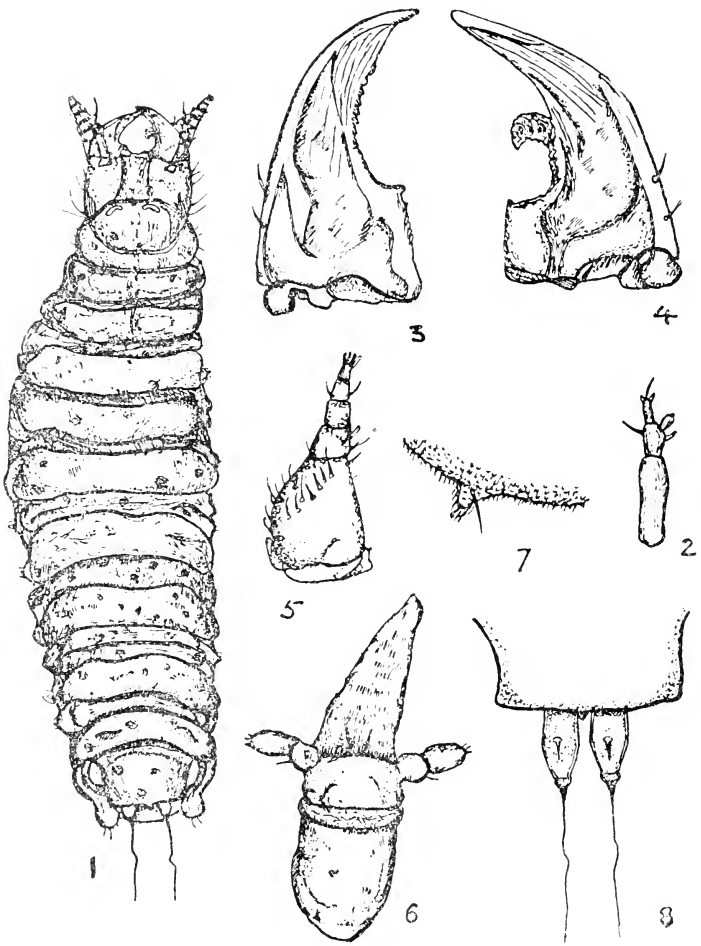

FIGURE I.—LARVA OF MEGASTERNUM BOLETOPHAGUM.

1. Dorsal view, × 20. 2. Right Feeler, × 100. 3. Left Mandible, dorsal view, × 160. 4. Right Mandible, dorsal view, × 160. 5. Right Maxilla, ventral view, × 100. 6. Labium, × 160. 7. Ventral contour of mesothorax with vestigial leg, inner aspect, × 160. 8. Cerci, dorsal view, × 120.

genus Megasternum appears to have been yet described, some details of the structure of this interesting grub may be of interest. I wish to thank Mr. McWhinney for his kindness in placing these specimens at my disposal, and giving me the particulars mentioned above as to their place of abode and time of occurrence. I would like also to thank Professor G. H. Carpenter for the help and advice that he has given me in the preparation of this paper, and for the encouragement that he afforded me while working in the zoological laboratory of the Royal College of Science for Ireland.

Description of the Megasternum larva.

Head obovate as long as broad ; clypeus narrow, convex, unidentate ; frontal processes short (fig. I, 1), occiput with medium groove (fig. I, 1) ; hypostome narrow with rounded base (fig. I, 6).

Feelers with first segment twice as long as second, which is a little longer than the third, terminal bristle elongate, papilla on second segment stout (fig. I, 2.).

Mandibles evenly rounded with acute apex ; right mandible (fig. I, 4) with a single large, obliquely truncated tooth and ridged surface internally ; left mandible untoothed (fig. I, 3), but with a series of six or seven backwardly directed serrations on the inner edge ; each mandible with two short stout bristles on the outer aspect near the base.

Maxillæ (fig. I, 5), with cardo, broad stipes bearing numerous spines externally, palpiger shortly cylindrical, galea and lacinia vestigial ; palp with three segments the terminal crowned with four small papillæ.

Labium (fig. I, 6) with small mentum, two-segmented palps, and long, subtriangular ligula.

Thorax with dorsal scuta ; pronotum well chitinised, covering the segment ; mesonotum shorter and feebler ; metanotum in two sections divided by linear membranous tract.

Legs vestigial, represented by a pair of spiniferous tubercles on the ventral surface of each thoracic segment (fig. 7). No distinct segmentation is apparent in these vestigial legs, each of which has a long bristle inserted on its inner aspect.

Abdomen with feebly developed terga, the cuticle covered with numerous minute tubercles giving a roughened appearance to the body (fig. I, 1) ; last abdominal tergum with short median spine (fig. I, 8).

Cerci prominent, sub-conical, inserted close together, each with a short dorsal spine and terminal, elongate, flexible bristle (fig. I, 8).

Length of full-fed larva 4 mm.

Colour mottled brown.

Comparison of Larva of Megasternum with allied Genera.

The general appearance of the Megasternum larva is very like that of the larval Cercyon described and figured by Schiodte. According to him the larva of Cercyon is legless, while, as stated above, the Megasternum larva has clearly recognisable though vestigial legs. It is, therefore, as regards this character, intermediate between Cercyon and Sphaeridium, whose grub according to Schiodte [1] has small but distinctly segmented legs. The head in the Megasternum larva is relatively broader than in Cercyon ; the segments and terminal spine of the feeler are shorter, the large antennal papilla relatively shorter and stouter. In both genera, the larvæ agree in the curious and characteristic asymmetry of the mandibles, the only notable difference being the feebler development in Cercyon of the serrations on the inner edge of the left mandible as compared with the Megasternum grub.

The base of the hypostome, rounded in the latter, is triangular in Cercyon, and the labial palps of Megasternum are shorter and thicker. In the Megasternum larva the mesonotum and metanotum are more strongly developed than in Cercyon. The cerci in the latter bear elongate lateral bristles in addition to the terminal ones present in Megasternum, the stout dorsal spines of which appear to be absent in Cercyon.

Cambridge.

[1] *Op. cit.*, pp. 220-1, pl. vi. figs. 6, 13.

THE BALANCE OF NATURE.

THE danger of turning loose foreign animals and of introducing foreign plants into any country has often been pointed out ; and almost as frequently the danger has been proved up to the hilt by practical experiments. The Scotsman who thought it would be nice to have a thistle to keep him company when he went to Australia and the man who introduced the Rabbit into the same continent are two well known, and no longer honoured, experimenters ; while the case of the Grey Squirrel at Castle Forbes referred to by Mr. Watt, p. 95 *ante*, is another case in point. Indeed one has merely to open any book dealing with economic zoology to obtain numerous proofs of the dangers attending such introductions.

The following is a good example :—" It appears to have been accidently introduced into New England some seventeen years ago on rose bushes from France. Since then it has rapidly spread and has not only caused damage over a large tract of country, but appears to be still on the increase." [1]

There is, moreover, another and quite different reason for objecting to such introductions, namely that in almost every country nowadays there is a body of naturalists engaged in working out its fauna and flora and the distribution thereof, and for any person to introduce a foreign species—or worse still a native species which has a restricted range in another district—can only tend to render more complicated the already very difficult labours of the students of distribution. Accidental introductions cannot always be avoided, but it seems strange to the writer that members of a learned Society in Ireland should be guilty of such a thing.

A friend who recently visited the Zoo at Dublin was naturally interested in the Lepidoptera larvae which are being exhibited there and he asked the attendant what

[1] *Vide* Theobald : Insect Pests of Fruit, p. 22, under the Brown Tail Moth.

was done with the perfect insects when they emerged. The reply was "Oh! we let them out!"

It is of course always urged by those who introduce species that their particular brand is quite harmless, "because it is so rare in its own country." The reason that it is so rare in its native haunts may very often be due to the fact that it has a most efficient parasite or enemy, and if relieved of the presence of this foe in its new haunts, the rarest species may well become a pest, though in the case of the Dublin Zoo, it is more the likelihood of false records for rare insects arising, than danger of a pest, that has prompted the writer to make this protest.

He has also recently been informed that on an island off the east coast of Ireland, in order to give some introduced species of birds a better chance to multiply, the owner has permitted the "shooting of hawks." It is to be hoped that the islanders, owing to this misguided move, will not suffer as the inhabitants of Rathlin Island are said to be doing from the depredations of the Brown Rats and Rabbits. Nevertheless I think our ornithologists could inform the owner of the island that this is more than likely to be the only result which will arise from the shooting of hawks.

AN IRISH NATURALIST.

A PLEA FOR MOSS STUDY.

BY REV. W. R. MEGAW, B.A.

AN impetus to the study of Mosses and Hepatics has been given by the recent formation of the British Bryological Society, with Mr. H. N. Dixon, author of the valuable "Handbook," as first President. Added to this we have Mr. J. A. Wheldon's exhaustive investigation of that difficult group of Hypna, the Harpidia.

It has been felt for some time that the classification of the Harpidia required overhauling. Mr. Wheldon set himself to the task and the results are to be found in his

"Key to the Harpidroid Hypna," reprinted from the 1921-2 numbers of "The Naturalist." Harpidia are extremely variable in form and colour and perhaps in no other group is there such warrantable scope for varietal differentiation. Even in pre-Wheldon namings we have, in the "Census Catalogue of British Mosses" for example, under *Hypnum aduncum* Hedw., a list of varieties reaching to η. The type and var. β each claim one Irish district; δ has nine Irish districts to its credit; and in August, 1920, I gathered var. η near Groomsport, in Co. Down.

There is much valuable work to be done in the field of Irish bryology, and the new Society together with recent additional literature make the present a suitable time to appeal for recruits. The study of Mosses has not been popularised to any great extent. It is comparatively easy to excite interest in Flowering Plants and Ferns, but the reasons often advanced for shunning bryology are more apparent than real. The thought of the microscope perhaps acts as a chief deterrent. The microscopic work required is really very elementary, if undue "splitting" be avoided. After a little experience, many Mosses, once determined, can be named in the field with or without the aid of a hand lens. The botanist who includes Mosses in his scope has this advantage, that he may continue his field work throughout the year. Examination of specimens may be made even long after the date of collecting, as Mosses well dried may be preserved for many years without detriment. It is to be hoped that this fascinating branch of study will not be neglected by the younger generation of Irish botanists.

Belfast.

NOTES.

Foxes in Co. Tyrone.

Mr. N. H. Foster's notes in the September number of the *Irish Naturalist* prompts me to state, that Foxes are now common in the mountains in the neighbourhood of Lough Fea. They made their first appearance here some eight years ago, and have increased, despite the large numbers destroyed by shooting and trapping.

Stewartstown. THOMAS GREER.

A Tunny Stranded at Castlerock.

While at Castlerock, Co. Londonderry, in September, I found after some gales in the early part of the month, a large fish thrown ashore on the strand, and one which is very rarely recorded from our shores. In fresh condition it had lost the front portion of its head, up to and including its eyes; it had probably been in contact with the revolving propeller of a small steamer, for it had two deep gashes in its under side. It was a very conspicuous object on the clean sand between tide marks for a few days, as it measured 8 feet 3 inches in length. It was probably almost 9 feet long when alive. The mackerel-like tail measured 27 inches from point to point. From a rough sketch made of it it was easy, on comparing it with the plate in Couch's "Fishes of the British Isles," to identify it as a full-sized Tunny (*Orcynus thynnus* Lütken) which that author gives as a Mediterranean fish, seldom captured outside the Gibraltar Straits. In vol. iv. of "The Natural History of Ireland," by Wm. Thompson, it is recorded that in November, 1841, a large Tunny was obtained in Ballyholme Bay, near Bangor, County Down, which measured 8 feet 3 inches in length, and was computed to weigh 300 lbs. It was impossible to ascertain the weight of the Castlerock example, but on a rough estimate it may have been put down at between three or four cwt.

W. SWANSTON.

Dunmurry, Belfast.

26/9/23.

Galium sylvestre in Co. Derry.

On the 29th July I gathered *Galium sylvestre* Poll., on Benevenagh, Co. Derry. The plant occurs sparingly but is quite typical. I can find no trace of a previous Co. Derry record.

W. R. MEGAW.

Belfast.

STRAY REFLECTIONS ON THE IRISH ALPINE FLORA.

BY R. F. SCHARFF, B.SC., PH.D.

Most of those who read Dr. Praeger's interesting notes on the botanical contrast between Switzerland and Ireland in the October number of this Journal must have wished to learn more of the author's experiences in the Alps and among the glorious flora of those mountains. He tells us in simple plain language what are the features that struck him most in the flora of the Swiss mountains as compared with that of Ireland. Carefully avoiding any controversial subjects such as the origin of the flora, he only briefly refers to their existence. Why should the Swiss alpine plants for instance stick to the mountains, whereas in Ireland a few of the same species are found at low levels? The author suggests that the low-level Irish habitat of these alpines is abnormal, and he expresses the opinion that the key of this mystery in distribution lies in the past history of the west of Ireland. He also dwells on the surprising fact that these Irish low-level alpines grow mixed with the most marked southern plants of our flora.

It is not for the first time that these peculiarities have been mentioned and discussed in the pages of this Journal. In the fauna, similar cases of distribution have been pointed out, so that the phenomenon is not confined to plants. The older subscribers of the *Irish Naturalist* will remember the stirring presidential address to the Dublin Naturalists' Field Club entitled "The Mingling of the North and the South," which was delivered by our late editor, Prof. Carpenter and published in this Magazine (vol. v., 1896). The author quoted many instances of animals of northern or alpine origin which in Ireland occupy the same territory as those which certainly came from the south. And in his opinion the latter had reached Ireland before the "Ice Age" and had probably survived it on some old tract of land, now submerged, to the south or west of Ireland.

Now it is a well-known fact that in late Pliocene times, or just before the time when the climate of Europe is supposed to have become greatly refrigerated, both the fauna and flora as a whole were similar to what they are to-day.[1] No doubt there still existed then a large number of species, particularly among the mammals, which having survived from previous geological periods are no longer with us. We must also assume that certain species originated during the subsequent Pleistocene period or "Ice Age" as it has been called. But the great mass of our animals and plants must have come into existence during a time when the climate of Europe was temperate or mild. Some forms, especially those which are known as persistent types, may have originated in still earlier periods than the Pliocene, when Europe had a warm or even semi-tropical climate.

Dr. Praeger states that in Pliocene times a new flora of Europe came into existence mainly derived from the Asiatic highlands. I am not sure that this view is generally accepted by botanists, but it seems as if the alpine plants and animals at any rate were largely of Asiatic origin. Irish botanists visiting Siberia in the summer would be surprised to find there puzzles comparable to those they were familiar with in Europe. The famous Edelweiss (*Leontopodium alpinum*) of the high Alps, which can be successfully cultivated in almost any Irish garden, is a common weed in the damp meadows of Siberia. There are many such examples which we need not enlarge upon. We seem therefore to share with Siberia the peculiarity that alpine plants grow naturally at a low level, whereas in Switzerland they need the mountain air. Although climatically Siberia and Ireland have little in common, the alpines in the former country are everywhere protected from the severe cold of the winter by a thick covering of snow. In the Alps they flourish under similar conditions. It is only in

[1] Reid, C.—Relation of the present plant population of the British Isles to the Glacial Period. *Irish Naturalist*, vol. xx., pp. 201-209, 1911.

Kennard, A. S. and B. B. Woodward.—British Pliocene non-marine Mollusca. Proc. Malacol. Soc. London, vol. iii., pp. 187-201, 1899.

Ireland that, owing to the mild winters, they do not need any protection. Alpine plants in fact do not tolerate extremes of temperature, and it always seems to me strange that so many botanists connect the presence of fossil remains of alpine plants with a former prevalence of an arctic climate. When we wish to grow the rarer species of alpines successfully in the plain, we do not expose them to the cold blasts of winter. We grow them under glass in a frame where they are surrounded by a rather mild temperature and effectively protected from climatic extremes. Most of the alpine plants of Switzerland cannot spread into the lower regions of the country because they would be exposed there to drought, and to extreme cold in the winter. And for this reason horticulturists find it impossible to grow many of the alpines in the open air in the lowlands of central Europe. The wide range and discontinuous distribution of many of the alpine plants indicate that they could not have spread from east to west or from north to south as long as the climate of Europe resembled the one we have now. It has been suggested that it was during the Glacial Epoch that these plants spread or wandered as we may say across vast stretches of country and thus reached their present habitats. This suggestion is founded on the fact that the remains of a few plants such as *Salix polaris*, *Dryas octopetala* and *Betula nana* have been discovered in the lowlands of central and western Europe. But of these only *Dryas octopetala* can be considered a truly alpine plant, and to judge from its extensive range it must be of great antiquity. *Dryas octopetala*, as well as all other alpine and northern plants found in Ireland, grows there naturally and apparently in a perfectly healthy condition, in a temperate oceanic climate almost at sea-level. Considering that most of the true alpines can be grown in the lowlands of Ireland, does it not seem as if we might formerly have had similar climatic conditions spread all over the European continent? Would not such conditions favour the geographical distribution of alpine plants? Prof. Brockmann-Jerosch indeed supports the view that the climate of Europe during the Ice Age must have been oceanic and that the Ice Age

itself had its origin in an oceanic climate combined with an increased precipitation.[1] A large part of central Europe was covered by the sea in Tertiary times so that the climate must then have been more oceanic and more equable than it is now. We know in fact from the remains of both plants and animals that the seas had a fauna allied to that of the Mediterranean and that the flora of the land was semi-tropical, at any rate in the earlier parts of the Tertiary Era. As extremely few of the alpine plants possess hard leathery leaves which might favour the survival of their imprints in mud or beds of clay, we know nothing of the past range of the great mass of these plants.

No doubt pre-Glacial deposits containing seeds are known, but so far only from the east coast of England, and they contain no seeds of alpine plants.[2] There is no positive evidence therefore that the majority of the alpine plants have originated and spread in Tertiary times, although this opinion is put forward by some very eminent botanists, among them Prof. Engler.[3]

If this view should prove to be correct, the oceanic low-level habitat of some arctic-alpine plants such as *Dryas octopetala* should not be considered as abnormal. On the contrary we should have to conclude that their habitat in the remote past, long before they were scattered from their original stations, was in the lowlands. Their Irish habitat would thus be a true relict of the past—a survival from Tertiary times. Their mountain habitat would have to be looked upon as an abnormal one to which the alpines had only gradually adapted themselves, having met there conditions suitable to their requirements.

Bray.

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[1] Brockmann-Jerosch, H. :—Die Vegetation des Diluviums in der Schweiz. Verhandl. d. Schweiz. Naturf. Gesellsch. 1920.

[2] Reid, C. and E. M. Reid :—The pre-glacial flora of Britain. Journ. Linn. Soc. London (Botany), vol. xxxviii., 1907.

[3] Engler, A. :—Monographie der Gattung Saxifraga. Breslau, 1872.

IRISH SPHAGNA.

BY WILLIAM A LEE, M.A., PH.D.

PREVIOUS lists of Irish Sphagna were published in the *Irish Naturalist* (vols. xxxi. No. 2, xxxii. Nos. 3 and 6). I am now able to furnish a few additions to the Sphagna of County Wicklow (Division 20), the result of somewhat extensive gatherings in Wicklow in the hilly country drained by the rivers Avonmore and Avonbeg, last October. Of these, two varieties and one form cannot be traced in previous Irish lists, while 12 varieties and 17 forms appear to be recorded for the first time in Division 20. It is apparent from this result in a restricted area that we are still far from a complete catalogue of the Irish Sphagna, and it is much to be regretted that so few workers have taken seriously in hand the survey of the suitable ground on which the members of the group are likely to occur. Quite apart from the strictly scientific interest of this pursuit, there is always the varied beauty of the material which, at certain seasons, offers a charm to the eye and mind excelled by scarcely any small natural objects. When, on some desolate mountain-side, we come upon cushions of Sphagna, showing the crimson of *S. quinquefarium* var. *roseum*, or the emerald such as we find in *S. cuspidatum*, or the amber or chocolate shades conspicuous in other species, we are impressed with the contrast between the wild massive mountain and the gentle soothing effect of the Sphagna. Even the stem and leaf forms present so much artistic arrangement and variety that a cultured mind would occupy itself with great delight in detecting the elements which constitute these special manifestations of beauty. So much also remains to be done in their ecological study that even a few accurate observations contribute to further progress, especially in regard to altitude and climate. In this spirit a short list is submitted showing the range at which the chief species occur in the area recently visited, so far as represented in these gatherings, and this can be compared with data furnished by other collectors (*vide* "Collection, Taxonomy and

Ecology of the Sphagna," by J. A. Wheldon, F.L.S., in "Lancashire and Cheshire Naturalist," 1918).

S. fimbriatum	..	200 feet
S. Girgensohnii	..	600 ,,
S. quinquefarium	..	1,000-1,350 ,,
S. plumulosum	..	300-1,300 ,,
S. squarrosum	..	400- 700 ,,
S. amblyphyllum	..	500- 700 ,,
S. recurvum	..	1,000-1,350 ,,
S. cuspidatum	..	1,000 ,,
S. molluscum	..	1,000 ,,
S. inundatum	..	700-1,350 ,,
S. auriculatum	..	300-1,200 ,,
S. aquatile ..	..	700-1,300 ,,
S. rufescens	..	1,100-1,200 ,,
S. papillosum	..	200-1,350 ,,
S. cymbifolium	..	500- 700 ,,

As on previous occasions I am under deep obligations to Mr. J. A. Wheldon, M.Sc., who readily undertook the determination of the specimens. Records marked with an asterisk cannot be traced in previous Irish lists; those with a dagger appear to be additions to Wicklow (Division 20).

S. fimbriatum Wils., †var. *validius* Card., f. *compactum* W.

S. Girgensohnii Russ., *var. *robustum* W., f. *speciosum.*

S. quinquefarium W., var. *roseum* W., †f. *brachyanocladum* W.

var. *versicolor* Russ., †f. *heterocladum* W.

†f. *drepanocladum* W.

S. plumulosum Roll., var. *viride* W., †f. *laxum* W.

†var. *purpureum* W., f. *gracile* W.

S. squarrosum Pers., †var. *spectabile* Russ., f. *patulum* W.

†var. *subsquarrosum* Russ ap W., f. *cuspidatum* W.

S. amblyphyllum Russ., †var. *mesophyllum* W., f. *sylvaticum* Russ.

†var. *parviflorum* W., *f. *Inghami* Wheldon.

S. recurvum P de Beauv., var. *majus* Angstr., †f. *sylvaticum* Russ.

†f. *pulchellum* W.

†f. *sphaerocephalum* W.

S. cuspidatum Ehrh., †var. *submersum* Schimp., f. *crispatum* W.

S. molluscum Bruch., †var. *vulgatum* W., f. *compactum* W.

S. inundatum R. et W., var. *ovalifolium* W., †f. *brachycladum* W.

†f. *densum* W.

S. auriculatum Schimp., var. *ovatum* W., †f. *variegatum* W.

†f. *pungens* W.

*var. *submersum* W.

S. papillosum Lindb., var. *normale* W., †f. *majus* Grav. (near sub-f. *elegans* Wheldon).

†sub-f. *elegans* Wheldon.

†sub-f. *subfuscum* Wheldon. (an orthoclade example).

f. *squarrosulum* Ingh. and Wheld. (sub-f. near *pulcherrimum* Ingh. and Wheld.).

†sub-f. *neglectum* Ingh. and Wheld.

f. *brachycladum* W. (approaching sub-f. *pallescens* Wheld.).

†sub-f. *flavofuscum* Wheld.

f. *confertum* W. (near sub-f. *inundatum* Wheld.).

var. *sublaeve* Limpr., †f. *glaucovirens* Schlieph.

†f. *breviramosum* W. sub-f. *heterocladum* W.

S. cymbifolium Ehrh., †var. *glaucescens* W., f. *squarrosulum* Pers., sub-f. *globiceps* W.

†var. *pallescens* W., f. *laxum* W.

†var. *fuscescens* W.

†var. *versicolor* W. (a very robust form resembling *S. subbicolor* Hampe., but with the chlorophyllose cells in section like those of *S. cymbifolium*. J. A. W.).

Rock Ferry, Cheshire.

REVIEWS.

The Ice Age in the North.

The Glaciation of North-eastern Ireland. By Major Arthur Richard Dwerryhouse, T.D., D.S.O., M.R.I.A., F.G.S. Quart. Journ. Geol. Soc., lxxix, part 3 (1923), pp. 352-422, plates xxiii-xxiv.

This is a paper which should receive the careful attention of all students interested in the study of the Pleistocene glaciation of Ireland. It deals with the advances, retreats, and re-advances of the Scottish and Donegal ice-sheets over a wide tract of country in north-eastern Ireland; and as it is, in Ireland, the first published study, on modern lines, of the effects of glaciation on a large scale, it is most welcome. As the publication of Major Dwerryhouse's work has been greatly delayed, its belated appearance is the more to be appreciated, and it is to be hoped that in the near future we may have the advantage also of knowing the results of Prof. Charlesworth's investigations regarding the glaciation of the north-west of Ireland, results which, we understand, have been ready for publication for some years past. By combining the conclusions of two specialists in Glacial phenomena, in these neighbouring areas, we should obtain a comprehensive view of the succession of events during the Ice Age in the North of Ireland.

The region described by the author includes the counties of Antrim and Down, with parts of Londonderry, Tyrone, Armagh, Monaghan, and Louth, and this large area has been divided into what he considers to be four natural geographical units—the basaltic plateau of Antrim, the valley of Belfast, the Palæozoic country of Down and Monaghan, and the igneous districts of Mourne, Slieve Croob, and Carlingford. Taking these areas in succession, the various Glacial deposits, and other results of the advances and retreats of the ice-sheets, are dealt with, and the boulder-clays, gravels and sands, and Glacial drainage channels are described in such detail that only a few salient points can be mentioned. In his work on the Glacial deposits of his district, whether boulder-clays or gravels and sands, the author has one outstanding advantage, in that there are many very definite rock-types which can be identified as occurring *in situ* in the Firth of Clyde. Among these may be mentioned the riebeckite-eurite of Ailsa Craig, the granite of Goatfell, and the quartz-porphyry of Drummadoon; and the discovery of any of these in the drifts to the southward is fair proof of the original northern origin of the deposit in question. Where a suite of these northern rocks is found any lingering doubt may be set aside. The author mentions a recent discovery by Mr. Robert Bell of the Ailsa Craig eurite at Drumanewy some miles west of Randalstown, and rocks of the same type have been found as far south as Monaghan town. In the account of the Ballycastle district the author gives an interesting description of the terminal

moraines of the last advance of the Scottish ice, and also of the gravel terraces of the Carey River, a more detailed account of which will be found in the forthcoming Survey Memoir on the Ballycastle district. The description of the frontal moraines of the Donegal ice-sheet in the Dungannon-Cookstown area standing "rank behind rank for several miles" is so striking that one would wish that the subject had been dealt with at greater length by the author.

In addition to his work on the drifts and their included erratics, Major Dwerryhouse has made a special study of the temporary lakes of late Glacial times, and their accompanying and resultant overflow or drainage channels. While the ice-sheets, which had invaded north-eastern Ireland either from the north or from the west, retreated towards their sources, temporary lakes were formed by the water from the melting ice being impounded between the slopes of the hills and the ice-sheets, and when the water of these lakes could find its way over a col or along the hillside towards ice-free country, it rapidly cut a ravine or overflow channel to the extent of its powers of erosion. With a farther retreat of the ice, ways of escape at lower levels were opened, the level of the water in the lake fell, and the temporary drainage channel was then abandoned. In any mountainous country which has been invaded by an ice-sheet these temporary drainage channels and hill-side gashes occur in great numbers, and we are introduced to some hundreds of them in the course of the paper, which is effectively illustrated by many figures and plates dealing with this interesting type of temporary erosion. In the Ballycastle district Major Dwerryhouse has mapped some striking examples of these drainage channels. When the seaward end of Glendun was filled with Scottish ice, the waters of the lake which had been formed in the upper portions of the valley could only escape towards the north by the comparatively ice-free valley of the Carey river, and the main road from Cushendun to Ballycastle now runs along the floor of the drainage channel which the outflowing waters of the lake had cut into the lowest portion of the ridge which separates Glendun from the lowlands south of Ballycastle. Another great drainage channel in this district is the Inver gorge, which carried away to the south-west the overflow waters from the lakes which had been formed to the east and south-east of Knocklayd. In the Slieve Gallion district the author has noted the very striking glens of Carndaisy and Gortanewry which he considers to be the drainage channels that carried the overflow of the temporary lakes of this district eastward and northward towards the valley of the Bann.

The Mourne Mountains have also yielded instances of these channels, and in the deep flat-floored narrow valley which connects Portadown with the head of Carlingford Major Dwerryhouse sees the drainage channel of the Lough Neagh basin during the time when the presence of the Scottish ice south of Coleraine prevented the escape of the waters of that basin towards the north. In Carlingford many drainage channels have been mapped, the most important being that which carried the overflow water of the Jenkinstown (glacial) lake into Glenmore. There are numerous channels on the slopes of Barnavave and Slieve-na-glogh

which the author deals with in the text, and of these the gorge north of The Bush station is probably the most important.

Regarding the view, put forward in Figure 12 of the paper, that the general direction of movement of the Scottish ice across the Mourne Mountains and across the lowlands of Mourne around Kilkeel was from north to south or south-east, a word of criticism may be made. That the lowlands of Mourne are cumbered with immense Glacial deposits of boulders, gravel, sand and clay, derived from the mountains to the north, cannot be gainsaid, and these deposits may have been incorporated in the Scottish ice as it moved southwards across the Mourne Mountains, and may afterwards have been deposited in the lowlands. But an earlier invasion of the lowlands of Mourne by Scottish or Irish Sea ice is evidenced by the occurrence of a basal boulder-clay, with marine shells, around Kilkeel, and in the valley of the White Water. In this basal boulder-clay, and in derived gravels, the reviewer, in recent months, found marine shells in great abundance, in many cases in an excellent state of preservation, and up to the present fifteen species have been obtained, including the usual proportion of arctic and northern forms. This investigation into the distribution of the shelly drift is being carried out with the aid of a government grant in the gift of the Royal Society of London, and Major Dwerryhouse's paper had already been completed when the work in the lowlands of Mourne was commenced during 1923. The facts which have been stated point to the conclusion that when the Scottish ice rounded the eastern slopes of the Mourne Mountains near Annalong, it moved inland and south-westward across the lowlands of Mourne, laying down the basal boulder-clay with its marine shells. That the Scottish ice moved inland from the direction of the Irish Sea, across the lowlands of Carlingford, and the country south of Dundalk, is also the opinion of the reviewer, although an examination of the Glacial deposits of Cooley has, up to the present, yielded no satisfactory evidence of the presence of shelly boulder-clay similar to that found in the Kilkeel lowlands.

But the paper must be read in its entirety to be fully appreciated, as there is a great amount of valuable detail which cannot be summarized. We may congratulate Major Dwerryhouse on the publication of a very notable contribution to the study of the Glacial geology of Ireland.

J. de W. Hinch.

A Chronological List of British Birds.

A Bibliography of British Ornithology from the Earliest Times: Supplement. A Chronological List of British Birds. By H. Kirke Swann, F.Z.S., etc. London (Witherby and Wesley, Ltd.). Price 5s. net.

By way of supplement to the important "Bibliography of British Ornithology" which, in conjunction with Mr. W. H. Mullen and Rev. F. C. R. Jourdain, he produced in 1920, Mr. Swann now publishes a highly interesting list of the birds of the British Islands arranged in the order in which they first received names in accordance with the Linnean system. The names given in the list are those that belong to the birds to-day, brackets being used to distinguish those parts of each binomial (or trinomial) name that were not in the name when first applied. The preface must be carefully read for the meaning of the various brackets used; but the list undoubtedly gives us an excellent bird's-eye view of the progress of ornithological nomenclature from 1758 to the present day. Some curious results are brought out from a glance over Mr. Swann's pages. One cannot but be struck at the slowness with which some now familiar birds crept into the notice of scientific name-givers. Thus it was not until 1817 that the Chiff-chaff was recognised and honoured with a binomial name, though we know from Gilbert White, who died in 1793, that it was already well known by its present English name of the "Chiff-chaf" to the country-folk around Selborne in his day. One does not, of course, need to go to Mr. Swann to learn facts like these, but his arrangement does much to force them on one's notice.

C. B. M.

IRISH SOCIETIES.

BELFAST NATURAL HISTORY AND PHILOSOPHICAL SOCIETY.

September 17.—Annual Meeting. Professor W. B. Morton, M.A., presided. The annual report of the Council expressed regret at the death during the year of three honoured members of the society:—Henry Riddell, M.E., M.I.Mech.E. (president and hon. treasurer); Joseph Wright, F.G.S.; and Madame Christen, who died at Llandudno. It was also intimated that a few members had had a small water-colour portrait of Mr. Riddell executed by Mr. Frank M'Kelvey, and they now asked the chairman to accept the portrait on behalf of the Society as a small token of their appreciation. The report went on to state that W. B. Burrowes, F.R.S.A.I., had taken over the duties of hon. treasurer, and thanks were accorded him for his work. There had been a steady increase in membership under the new subscription scheme. Lectures given during the session had been well attended and were much appreciated. The Council was of opinion

that the Society should again become a member of the British Association, and appointed Mr. Allworthy to represent the Society at the meeting in Liverpool. The report also referred to the work of the archaeological section at Nendrum Monastery, Mahee Island, and said that the chairman (Sir Charles Brett) and hon. secretary (Mr. Lawlor) and those associated with them deserved the thanks of Ulster for the work which was being carried out.

At a subsequent meeting of the Council, Professor Morton was unanimously elected President of the Society for the coming session. W. B. Burrowes was re-elected hon. treasurer; R. M. Young, M.R.I.A hon. librarian; and Arthur Deane, F.R.S.E., hon. secretary.

BELFAST NATURALISTS' FIELD CLUB.

Sept. 29.—Fifty-seven members and friends visited Purdysburn Glen, under the guidance of Arthur Deane, M.R.I.A., F.R.S.E., in order to study the fungus flora.

On reaching the woods Mr. Deane gave a short account of the life-history of fungi and their place in nature's economy; how the older and more primitive types were aquatic in habitat, and showed the characters of the algae from which they are regarded as having descended.

Many members collected keenly, and some interesting species of fungi were found, particularly among the gill-bearing class, such as *Hypholoma fasciculare*, *Coprinus spp.*, *Pholiota squarrosa*, *Pleurotus ostreatus*, *Armillaria mellea*, and *Amanita muscaria*, while among the decaying bracken was found the "Birds Nest" fungus (*Crucibulum vulgare*), but perhaps the most interesting were the Slime-fungi (Myxomycetes), a specially large mass being found in the woods.

On reaching an open glade at the glen head, an examination of many finds was made, and a business meeting was held (Rev. W. R. Megaw, B.A., presiding), when eleven new members were elected.

ROUTE NATURALISTS' FIELD CLUB.

August 11.—Excursion to Runkerry—The members met at Runkerry House, about two dozen strong, and made for the strand. Here, amid a convenient circle of rocks, the Secretary read some notes furnished by R. J. Welch, M.Sc., on the geology and zoology of the district.

An adjournment was made to Runkerry House, where tea was provided through the kindness of the Misses Macnaghten, after which a talk illustrated by many drawings and sketches, was given by Mr. J. J. Phillips, C.E., Dhu Varren, Portrush, on the ancient Cistercian Abbeys of Down.

September 15.—A visit was paid to the ruins of Dunseverick Castle. Its history was dealt with in a paper by Canon Ford, read to the members on the historic site by the secretary, the Rev. E. M. Gumley.

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A MONTHLY MAGAZINE,

EDITED BY

JAMES RITCHIE, M.A., D.Sc., F.R.S.E., F.L.S.,

Keeper, National History Department, Royal Scottish Museum, Edinburgh.

PERCY H. GRIMSHAW, F.R.S.E.,

Natural History Department, Royal Scottish Museum.

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