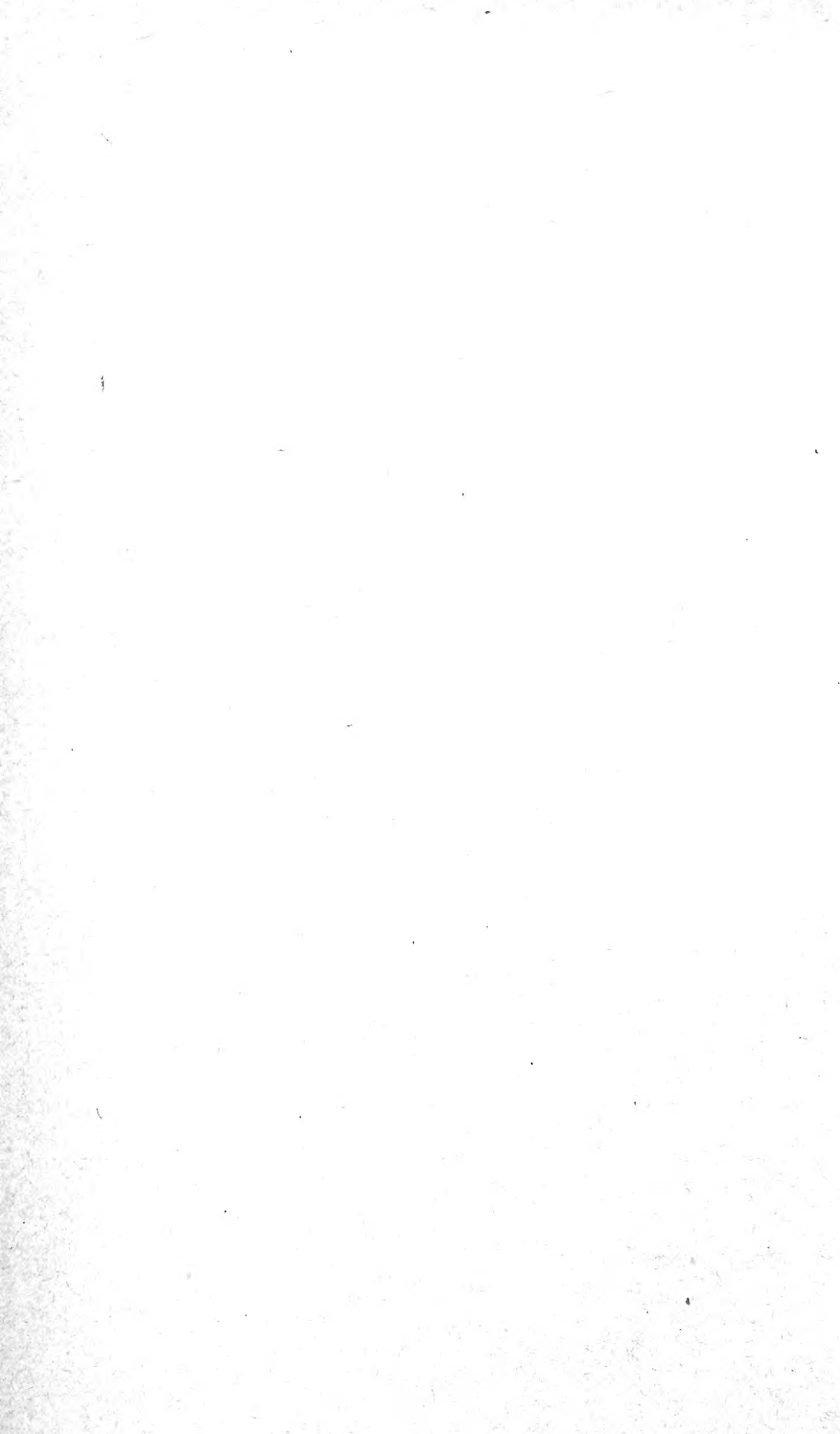


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The Annals

OF

Scottish Natural History

A QUARTERLY MAGAZINE

WITH WHICH IS INCORPORATED

“The Scottish Naturalist”

EDITED BY

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1899



EDINBURGH

DAVID DOUGLAS, CASTLE STREET

LONDON: R. H. PORTER, 7 PRINCES ST., CAVENDISH SQUARE

A161(28)

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The Annals of Scottish Natural History

No. 29]

1899

[JANUARY

THE LATE JAMES HARDY, LL.D.

THE death of Dr. Hardy, which took place at his residence at Oldcambus Town Head, in the Parish of Cockburnspath, Berwickshire, on Friday, the 30th of September, 1898, has caused a blank in the ranks of Scottish Naturalists, which will not be easily filled. Born near Penmanshiel, on the 1st of June 1815, James Hardy had thus, at the time of his death, already entered upon his eighty-fourth year; but he came of a long-lived race, and, as recorded upon the tombstone in God's acre at Coldingham Abbey, where his mortal remains were laid in their last resting-place, on Wednesday, the 5th of October last, his father had lived to the ripe old age of 100 years.

The eldest son of a highly respected family, which had for many years been established as farmers in the Parish of Cockburnspath, James Hardy, after obtaining a good preparatory education at the village school, entered the University of Edinburgh about the year 1833. After four sessions of College life, one of which was spent at Glasgow for the purpose of attending a special class there, he returned home in somewhat indifferent health, and for a few years his course in life seems to have been uncertain. Although from early boyhood a most diligent student, he appears to have

evinced little predilection for any of the professions, and until 1846 he remained at home, busying himself about the farm, but all the time improving himself by close and attentive reading. In that year, what seemed a favourable opportunity of opening an Academy for higher education presented itself at Gateshead-on-Tyne, and he went there and laboured, not unsuccessfully, for a few years; but, his health again giving way, he was compelled once more to return to the parental roof. From this time forward, up to the date of his death, he continued to reside in his native parish, ostensibly engaged in farming, but neglecting no opportunity of making himself thoroughly acquainted with the Natural History, and Antiquarian lore, of the Border Counties, and extending his reading to a great variety of subjects. During his residence in Gateshead he became acquainted with many of the leading scientific men on Tyneside, and joined the Literary and Philosophical Society of Newcastle, as well as the Newcastle Antiquarian Society, and he was one of the earliest members of the Tyneside Naturalists' Field Club, formed in 1846. In 1848, in conjunction with his friend the late T. J. Bold, he undertook "A Catalogue of the Insects of Northumberland and Durham," which was published, with Hardy as its editor, in the "Transactions" of the Tyneside Club.¹ The Catalogue extended to the order *Coleoptera* only, and, including, as it did, 353 genera, and 1170 species, was marvellously exhaustive, taking into account the somewhat meagre attention which had, up to that time, been paid to the Beetles of the district. Many other papers from his facile pen appeared from time to time in different scientific journals, always written with that accuracy, and careful regard to fact, which ever distinguished him; and he was soon recognised, not merely as an authority on all local subjects, but as one well versed in some of the least-known branches of Botany, and Entomology. The pages of the earlier numbers of the "Border Magazine" were frequently enriched by his essays, not always confined to prose work, and the Folk Lore Society was equally indebted to him. Amongst his contributions to the last-named Society may be mentioned his "Popular

¹ Vol. i. pp. 37-96, and vol. ii. pp. 21-97, and 164-287.

History of the Cuckoo,"¹ which contains a vast fund of information on this oft-written-upon, and almost inexhaustible subject; and the paper, which runs to over 40 pp., is an apt illustration of the resources of its author, and the thoroughness with which his work was always done. In 1892-95 the Folk Lore Society published, under his editorship, two volumes entitled "Denham Tracts," comprising a collection of folk lore by Michael Aislabie Denham; and interspersed throughout the book are to be found many additions by the editor from his own store of information, these being always distinguished by the initials (J. H.) appended to them.

It was, however, in connection with the Berwickshire Naturalists' Club that Dr. Hardy was perhaps best known, and to the members of that club his loss is well-nigh irreparable. Though he did not formally join the club till 1863, he had contributed considerably to its "Proceedings" for many years previously;² and upon the death of Mr. George Tate, in 1871, he was appointed, along with the late Dr. Francis Douglas, to the Secretaryship. From that time forward the duties of editing the annual publications devolved almost entirely upon him, and the success with which he accomplished that work is written in every volume of the Club's history. Losing the help of Dr. Douglas by that gentleman's death in 1886, Dr. Hardy acted as sole Secretary of the Club till 1896, when the Rev. George Gunn was associated with him in that office. In recognition of his valuable and gratuitous services, his fellow members presented him, in the jubilee year of the Club (1881), with a valuable microscope bearing an appropriate inscription, together with a cheque for £111 towards enabling him to bind up his voluminous collection of books, pamphlets, and manuscripts.

In April 1890, Mr. Hardy had the degree of LL.D. conferred upon him, *honoris causa*, by the University of Edinburgh; and two months later, at its first meeting for the year, the members of the Berwickshire Naturalists' Club, in

¹ Folk Lore Record, part ii.

² His first paper, entitled "Contributions to the Flora of Berwickshire," appeared in 1839, vol. i. pp. 206-210.

tendering their congratulations to him, upon the distinction conferred upon him by his *Alma Mater*, made him the recipient of a handsomely illuminated address, together with a cheque for £400.

Through the instrumentality of the late Sir William J. Hooker, James Hardy had become known, at an early period, to the late Dr. George Johnston, of Berwick-on-Tweed, and their acquaintance soon grew into a close friendship, which was only to be parted by death. How well and usefully they worked together is demonstrated in nearly every volume written by the gifted author of "The Natural History of the Eastern Borders"; and a few years ago Dr. Hardy edited a volume of the correspondence of his late friend, which had been brought together, and was published by his daughter Mrs. Barwell Carter. Amongst the many contributions to our knowledge of the Border Counties, for which we are indebted to Dr. Hardy, may be instanced his "Popular Rhymes of Berwickshire," "The Wild Cat in the Border District," "Bowling as an Extinct Game in Berwickshire," the "Lichen Flora," and "Moss Flora of the Eastern Borders," his "Contributions to the Entomology of the Cheviot Hills," "On Urns and Other Antiquities found round the Southern Skirts of the Cheviot Hills," "Ancient Stone and Flint Implements of Berwickshire and the Borders," and his "History of the Wolf in Scotland"—all of which appeared in the "History of the Berwickshire Naturalists' Club," and are full of interesting details concerning the subjects treated. Many of them have been largely quoted, not always with due acknowledgment made, and one of them, "The Wolf in Scotland," was so appreciated by Mr. Harting, that it was very largely made use of in his "Extinct British Animals," with but very scanty reference to the source from which his information was obtained; and the writer has frequently heard Dr. Hardy refer, with considerable sarcasm, to the piracy so committed. Many other papers, too numerous to refer to here, were contributed by him; and in these are to be found, not only additions to the local Fauna, and Flora, but many species are therein recorded, which had not previously been found in Scotland, or the British Islands, while not a few of them were entirely

new to science. To enumerate even the latter is beyond the scope of this article, but several of his discoveries, still bearing the specific name of *Hardii*, will serve to keep for ever green the memory of one we all loved so well.

In Ornithology, as in other matters, Dr. Hardy's local knowledge was very extensive; while the readiness with which he was always willing to place his information at the disposal of others is amply acknowledged in Mr. Muirhead's "Birds of Berwickshire," scarcely a chapter of which but bears the impress of his helping hand. His knowledge of local family, and county history was also very great; but enough has already been said to illustrate the varied, and extensive character of his work, and it is no flattery to say, *quod tangit ornat*. Dr. Hardy married in 1877 a daughter of the late Mr. Halliday of Wooler, who was a distant relative, and she survives to mourn his loss; he had no family.

A few years ago he had a severe attack of shingles, followed by heavy hemorrhage from the nose; but though this had greatly reduced his accustomed vigour, his friends had no reason to anticipate so sudden a collapse as that which occurred. The garden at Town Head, enriched from time to time by the attentions of a wide circle of botanical friends, contained a fine collection of alpine, and herbaceous plants, many of which were grown in a state of great perfection; and it was Dr. Hardy's almost invariable habit, when the weather permitted, to make a tour of inspection round his borders after tea-time. Owing to the fine open autumn, many of these were in full bloom on the 30th September, when he went out for the last time to take his accustomed walk. Thinking that he was lingering over them longer than was prudent, Mrs. Hardy shortly afterwards followed her husband into the garden, and was shocked to find him lying peacefully in his last slumber.

At the annual meeting of the Berwickshire Naturalists' Club, which fell due within a few weeks of Dr. Hardy's death, a most feeling tribute was paid to his memory by the President of the Club, Colonel Milne Home, and a scheme was inaugurated by which it is hoped to publish some suitable monument of one who had the best interests of the Club so much at

heart. As one of a small committee appointed at that meeting, it fell to the lot of the writer, a short time ago, to go through some of the papers left by the subject of this notice, and to say that the quantity of MSS. discovered was a surprise is to convey but an inadequate idea of its extent. Whenever a rare book, or document of interest, came within his reach it had been carefully, and literally transcribed, and the amount of physical labour entailed in this respect alone must have been enormous; but in addition to the copied matter, a large quantity of original, and collated material was disclosed, and from this it is hoped to publish as soon as possible one or more memorial volumes.

GEORGE BOLAM.

NOTES ON THE EFFECTS OF THE RECENT OCTOBER GALE UPON MARINE LIFE ON THE COASTS OF THE LOTHIANS.

By WILLIAM EVANS, F.R.S.E., M.B.O.U.

THE outstanding feature of the weather experienced on the east side of Scotland during October 1898 was the severe easterly gale which set in on the 14th, and, but for a temporary lull on the 16th, continued without cessation till the morning of the 19th. A natural result of so protracted a gale from the direction of the open ocean was, of course, an exceptionally heavy sea in the Firth of Forth. The fact, too, that the storm was coincident with the spring tides rendered it all the more destructive. The 17th and 18th were particularly stormy days, and it was during full tide on the morning of the latter day that the bulk of the extensive damage to property took place. Harbour works, sea-walls and embankments, shipping, etc., were everywhere more or less seriously damaged, while many houses in the low-lying parts of the coast towns and villages were flooded to an alarming extent. Sandhills and natural embankments closely abutting on the beach were in many places very considerably encroached upon, and numbers of pine trees

growing alongside the shore west of Granton were undermined and overthrown.

It is not, however, the object of the present notes to enlarge upon the damage done to property by the storm, but to give some indication of its effects on certain members of the marine fauna of the Firth of Forth as observed by myself on various parts of the coast between North Berwick and Cramond. On 20th October I walked along the beach from Levenhall to Cockenzie for the purpose of seeing what had been cast ashore there. I next examined the shore from Portobello westwards towards Leith. Then followed excursions from North Berwick to Gullane, Longniddry to Gosford, and Granton to Cramond.

If one may judge by the paucity of positive evidence met with on the beach, the fatalities among the feathered frequenters of the Firth must have been wonderfully few—a young Gannet, two Shags, a Guillemot, a Herring Gull, and a Kittiwake being the only dead birds I noticed myself. A Storm Petrel, however, was picked up near Dunbar, and another was got at Cramond; and Mr. R. Godfrey found the remains of a Pomatorhine Skua near Bo'ness.

I had hoped to find some of the rarer fishes washed ashore, but in this I was sadly disappointed; for, with the single exception of a specimen of the Four-bearded Rockling (*Motella cimbria*) kindly handed to me by Mr. Godfrey from the shore between Leith and Portobello, nothing uncommon came under my notice. Indeed, examples of any species of fish, save one, were decidedly scarce. The Cat or Wolf Fish (*Anarrhichas lupus*) was this exception, and it was a notable one. Hundreds were cast up on the beach in the neighbourhood of North Berwick. On 26th October I counted no less than 204 between the harbour and a point opposite the island of Fidra, and many more were no doubt buried beneath the tons of tangle (*Laminaria*), wrack (*Fucus*), and other sea-weeds heaped at the farthest corner of every little bay. Over thirty were to be seen in a small bay between Gosford and Aberlady, and numbers were also stranded, I was told, in the vicinity of Dunbar. The majority of those I saw were from two to three feet in length: the largest measured was 3 feet 5 inches, while a few were not more

than one foot. That such wholesale destruction should have overtaken this particular fish, while others inhabiting the same localities escaped, is certainly somewhat puzzling. They must have been literally pounded to death amongst the rocks by the force of the waves, having probably in the first place been caught up by the ground-swell invading their haunts at low-water. The only other fishes I observed were half a dozen Anglers (*Lophius piscatorius*), a few Sea-Bullheads (both *Cottus bubalis* and *C. scorpius*; one of the latter, got at Morrison's Haven, being a well-marked example of the var. *gronlandica*), a Whiting, and a small Coal-fish.

Of the Invertebrates, none seem to have suffered more than the Mollusca; and perhaps the most interesting forms I met with were two Cephalopods, namely *Rossia macrosoma*, of which one specimen occurred at Morrison's Haven, and *Eledone cirrosa*, of which nine lay stranded on the beach west of North Berwick (see separate note on p. 53). An example of another Cephalopod, *Todarodes sagittatus* (Lmk.), was cast ashore west of Portobello. Among Gastropods, the Common Whelk (*Buccinum undatum*) was a conspicuous sufferer, large numbers of shells, with the all but dead animals hanging half out of them, being thrown up by the waves in many places. The still larger *Neptunea antiqua* had also succumbed in considerable numbers. Shells of *Philine aperta*, with the animals attached, were fairly common among rejectamenta immediately to the west of Portobello; and on the beach at Prestonpans, the day after the storm, I picked up two specimens of *Capulus hungaricus* still showing signs of life.

But no forms seem to have fared worse than some of the Lamellibranchs. Living gregariously, as so many of them do, practically on the surface of banks of sand or mud in more or less shallow water (some not even beyond low-water mark), they fall a ready prey to the fury of storms of the present type. Whole colonies of certain species must have been literally ploughed up and swept bodily away by the terrific ground swell, and after much tossing too and fro deposited in a dead or dying state on the gently sloping beach. A few Oysters (*Ostrea edulis*) came ashore at Preston-

pans, and also, I was told, to the west of Portobello; but as usual it was the Scallop or Clam (*Pecten opercularis*) that was most in evidence. At Prestonpans they were stranded in great numbers, to the evident regret of the fishermen, who depend much on this species for bait. Many were also thrown up between Portobello and Leith, and to the westward of Granton, but in nothing like such numbers as I remember seeing in these localities after a storm about twenty-two years ago. The Common Mussel (*Mytilus edulis*) was likewise conspicuously abundant, and its larger relative (*Modiola modiolus*) was more or less plentiful in most localities. Many Cockles (*Cardium edule*) were to be seen scattered along the tide-mark, and in several places, as for instance on the Craigentenny shore, *C. echinatum* was common. Near Port Seton a specimen of *C. norvegicum* occurred, and an example of *Pectunculus glycymeris* was picked up alive at Prestonpans. The large *Cyprina islandica* was common between Prestonpans and Cockenzie and some other parts of the coast, as were also *Venus gallina*, *Tapes pullastra*, *Mactra solida*, and a few other species. *Venus exoleta* and *V. linctata* were both cast up alive on the beach between North Berwick and Dirleton, but only in very limited numbers. At the same place I picked up several detached valves of *V. fasciata*, and of *Pholas crispata* and *P. candida*, but I doubt if they were there as the direct effect of the storm. *Mactra stultorum* and *M. subtruncata* were both numerous on the Craigentenny shore and between Longniddry and Port Seton, and in the same localities many examples of *Lutraria elliptica* were lying about—all I examined being empty, however, for the animal is soon separated from the shell. A feature of the beach at Levenhall was the abundance of *Tellina balthica*, which shell was also present in a number of other places. Other species cast up, but not in any quantity, as far as I observed, were *Tellina tenuis*, *T. fabula*, *Scrobicularia alba* (Portobello), *Donax vittatus* (Longniddry), and *Corbula gibba* (one specimen west of Granton). In several localities *Mya arenaria* and *M. truncata* were numerous, and *Saxicava rugosa* was everywhere common in roots of tangle. *Anomia ephippium*, *A. patelliformis*, and *Helcion pellucidum* were also common on tangle roots, etc.

Crustaceans, too, it was evident, had perished in large numbers. Hundreds of dead Hermit Crabs (*Pagurus bernhardus*), many of them of large size and nearly all in the naked condition, were noticed on several parts of the shore; and Spider Crabs (*Hyas araneus*), all more or less mutilated, were frequent. Among the heaps of sea-weed and other debris, mangled remains of the Common Shore-Crab (*Carcinus mænas*) were abundant, while here and there many examples of its swimming relative *Portumnus depurator* were met with. On the Craigentenny beach, two specimens of the small *Porcellana longicornis* were obtained. At North Berwick a good many Lobsters (*Homarus gammarus*) were cast ashore, and near Prestonpans I picked up a broken specimen of *Nephtrops norvegicus*.

To all appearance, the destruction of Echinoderms had not been less heavy. On the shore west of North Berwick many large Sea-Urchins (*Echinus esculentus*), battered and rubbed, were scattered about, and they again occurred in considerable numbers a mile or so west of Aberlady, while odd ones were noticed much farther westwards. At Boglehill, Longniddry, two specimens of *E. miliaris* were found. *Echinocardium cordatum* was cast up, but not in any abundance, at several points between North Berwick and Gullane, and at Longniddry. Great numbers of the Common Cross-fish (*Asterias rubens*), dead and broken, were lying about; and the Sun-star (*Crossaster papposus*), though less numerous, was likewise common. *Solaster endica*, *Cribrella oculata*, and *Ophiothrix rosula* (= *O. pentaphyllum*?) occurred, but not plentifully, at Prestonpans and Dirleton; and among rejectamenta at Morrison's Haven a couple of *Ophiopholis aculeata* were obtained.

Of other groups I took little note, but I could not help being struck with the great numbers of the two common Sea-Anemones (*Actinia mesembryanthemum* and *Tealia crassicornis*), and also of *Alcyonium digitatum* and an Ascidian (*A. virginea*?), mixed up in the general wreckage at several points between North Berwick and Port Seton. The Sea Mouse (*Aphrodite aculeata*) occurred in some numbers at Gosford, Prestonpans, and Portobello. Any one interested in Hydroid Zoophytes could, no doubt, have

got quite a number of species: I noted *Thuiaria thuja* and a few other conspicuous forms in several places.

The list, it will be seen, is almost entirely made up of veritable "common objects of the sea-shore," as indeed it was bound to be. It is, perhaps, unnecessarily long, but my object in making direct references to so many species is to show more clearly how widespread the influence of the gale really was.

NOTES ON THE BIRDS OF BALLINLUIG DISTRICT, PERTHSHIRE.

By BRUCE CAMPBELL.

DURING the last five years, in the months of May, June, July, or August, I have spent my annual holiday at Ballinluig; and having paid considerable attention to the bird-life during my rambles in the district, I now venture to put my notes on record. The district is situated between Dunkeld and Pitlochry, and is noted for its exceedingly mild climate. The lower ground is well wooded, and consists chiefly of Scotch Fir, Larch, and Oak; the higher ground is principally moorland, and somewhat rocky.

For other information regarding the ornithology of the Upper Tay area, I may refer readers to 'Notes on the Birds of North-West Perthshire,' by William Horn, "Proc. Natural History, Society of Glasgow," vol. ii., 1881, pp. 54-69.

WHINCHAT, *Pratincola rubetra*.—A scarce summer visitor. A pair usually seen about the whins at the golf-course.

STONECHAT, *Pratincola rubicola*.—Also scarce, but three or four haunt the railway embankment between Ballinluig and Logierait.

WHITETHROAT, *Sylvia cinerea*.—Not at all scarce. This species is not mentioned in Mr. Horn's list, though he gives the Lesser Whitethroat—probably an error.

BLACKCAP, *Sylvia atricapilla*.—Very scarce. Not noted by Mr. Horn, but one or two summer in the wood at Ballinluig.

GARDEN WARBLER, *Sylvia hortensis*.—Also a very scarce bird. I only once heard it, and then among the broom at Ballinluig.

- CHIFF-CHAFF, *Phylloscopus rufus*.—One pair heard and seen in the wood at Logierait in June 1893.
- LONG-TAILED TIT, *Acredula rosea*.—Not very common. A family party occasionally met with.
- MARSH TITMOUSE, *Parus palustris*.—Scarce. First observed in June 1893 in the fir wood at Logierait.
- GRAY WAGTAIL, *Motacilla melanope*.—Somewhat scarce. Two or three occasionally seen about the Tummel side.
- GOLDFINCH, *Carduelis elegans*.—One or two birds seen daily for two weeks in July 1895 (see "Annals," 1895, p. 251, and 1896, p. 25).
- SISKIN, *Chrysomitris spinus*.—Not at all scarce, and generally distributed; but is most plentiful about Tullymet.
- LESSER REDPOLL, *Linota rufescens*.—Not at all scarce. I saw several birds, evidently paired, in May 1897.
- TWITE, *Linota flavirostris*.—One bird only observed on the moor near Balnagard.
- CROSSEBILL, *Loxia curvirostra*.—A flock of about forty observed in August 1894 on Killiehangie Hill.
- CORN BUNTING, *Emberiza miliaria*.—Not common. One or two pairs at Logierait.
- JAY, *Garrulus glandarius*.—By no means scarce, although regarded by game-preservers as vermin and shot and trapped at every opportunity. On more than one occasion I have seen as many as five old birds flying together into a fir wood in several places in this locality. I do not think the bird is decreasing in numbers. On 2nd May 1898 Mr. Laidlaw and I saw a party of at least twenty in a wood at the foot of Killiehangie Hill.
- RAVEN, *Corvus corax*.—I have seen three or four, recently killed, hanging at the keeper's "Larder" at Kinnaird House.
- CARRION CROW, *Corvus corone*.—Plentiful all over the district. I have seen several hybrids between this and the next species.
- HOODED CROW, *Corvus cornix*.—A single bird occasionally seen about Killiehangie.
- KINGFISHER, *Alcedo ispida*.—Very scarce. Only one bird observed, in June 1893, flying down the Tummel.
- WHITE OWL, *Strix flammea*.—I have only seen a single bird of this species in the district, near Logierait. All Owls are rare owing to game preserving, and are usually seen nailed to keepers' "Larders."
- LONG-EARED OWL, *Asio otis*.—Decidedly scarce. I was shown a nest, the young from which had been destroyed, at Logierait.

- TAWNY OWL, *Syrnium aluco*.—Although scarce, this is the commonest species of Owl in the district.
- BUZZARD, *Buteo vulgaris*.—Scarce. A single bird was seen, in 1895, about Killiehangie.
- SPARROW-HAWK, *Accipiter nisus*.—Somewhat scarce. In June 1893 I discovered a nest containing six eggs in a fir tree on a small island on the Tummel at Ballinluig; and the following year, in the wood near the school, I found a nest with four eggs—the female sat on the nest till a keeper actually touched her.
- MERLIN, *Falco aesalon*.—I have only two records for this species, namely, August 1896 and May 1897.
- COMMON HERON, *Ardea cinerea*.—Fairly common, though there is no heronry in the district.
- COMMON SHELD-DUCK, *Tadorna cornuta*.—One pair only observed, in June 1893, flying up the Tummel. Not in Mr. Horn's list.
- GOOSANDER, *Mergus merganser*.—One pair observed in May 1897.
- STOCK DOVE, *Columba oenas*.—Not uncommon, and appears to be on the increase.
- CAPERCAILLIE, *Tetrao urogallus*.—Common in this district. Most plentiful in the wood between the junction of the Tay and Tummel.
- BLACK GROUSE, *Tetrao tetrix*.—Not a very plentiful species in the district.
- COMMON COOT, *Fulica atra*.—Only one pair seen, and they were accompanied by a brood of young.
- OYSTER-CATCHER, *Haematopus ostralegus*.—Very plentiful. Breeds in numbers among the stones on the islands and by the river side (Tummel). Observed by Fleming ("British Animals," 1828), breeding at Moulinarn.
- WOODCOCK, *Scolopax rusticula*.—Plentiful. May be seen on summer evenings flying over the tree tops.
- COMMON TERN, *Sterna fluviatilis*.—A few pairs about the Tummel. Earliest seen, 3rd May 1897. (This species is not recorded by Mr. Horn, who, however, includes the Arctic Tern—surely a mistake.)
- PUFFIN, *Fratercula arctica*.—One seen on the Tummel at Ballinluig, in August 1891, by my friend William Smith, M.A.
- LITTLE GREBE, *Podiceps fluviatilis*.—Fairly common. Usually nests at the curling pond, Logierait.

In addition to the species specified, I have also seen the following birds in the district, about which it is not necessary to offer any remarks. There are the Missel Thrush, Song Thrush, Blackbird, Ring Ouzel, Wheatear, Redstart, Redbreast, Goldcrest, Willow Wren, Wood Wren, Sedge Warbler, Hedge Sparrow, Dipper, Great Titmouse, Cole Titmouse, Blue Titmouse, Wren, Creeper, Pied Wagtail, Meadow Pipit, Blue Pipit, Spotted Flycatcher, Swallow, House Martin, Sand Martin, Greenfinch, Sparrow, Chaffinch, Linnet, Bullfinch, Yellow Bunting, Reed Bunting, Starling, Jackdaw, Rook, Skylark, Swift, Cuckoo, Kestrel, Mallard, Teal, Wood Pigeon, Red Grouse, Pheasant, Partridge, Corn-crake, Waterhen, Golden Plover, Lapwing, Snipe, Redshank, Curlew, Black-headed Gull, Common Gull, and Lesser Black-backed Gull.

NOTE ON THE EGGS OF THE WOOD SAND-
PIPER (*TOTANUS GLAREOLA*) TAKEN IN
ELGINSHIRE IN 1853.

By WILLIAM EVANS, F.R.S.E., M.B.O.U.

SOME years ago, when looking over the pages of Morris's "Naturalist," I came upon the following note by the late C. Thurnall, Whittlesford, Cambridge, which I have not seen mentioned in any ornithological work. It occurs on page 254 of the part for November 1853, and reads as follows:—"I obtained a nest, containing four eggs, of the Wood Sandpiper, on the 23rd of May 1853, from a birch plantation, situated some distance from a small loch in the county of Elgin, N.B. I saw the bird fly off the nest, and I remarked to my companions that it was a Wood Sandpiper, and when I saw the eggs I was perfectly satisfied that I was correct. I have shown them to Mr. Yarrell, who says they are extremely like that bird's eggs; and Mr. Bond has also seen them, and has no hesitation in pronouncing them as such."

The above note, it will be seen, sheds a flood of light on the history of the eggs in Bond's collection, to which A. G.

More and other writers refer. More's words ("Ibis," 1865, p. 435) are:—"My friend Mr. F. Bond tells me that he has some eggs taken in Elginshire, which he considers belong to the Wood Sandpiper." That Bond's eggs were from the nest recorded by Thurnall there can, I think, be no doubt, though positive proof may not be forthcoming. Assuming that the specimens, or some of them (for Thurnall may not have parted with the whole clutch), are still in existence in the collection of Baron d'Hamonville (to whom Bond sold his collection in 1875), or partly there and partly in Thurnall's collection, wherever that may now be, it is far from certain that their identity could now be established. Neither Bond nor Thurnall, I understand, were in the habit of writing on their eggs. Professor Newton tells me that, in a list of Thurnall's collection drawn up after his death (some ten to fifteen years ago?), "4" Wood Sandpiper's eggs are entered; but no particulars are given, and these specimens, or some of them, may very well have been Continental ones, which were easily enough obtained in the "fifties." But even if the Elgin eggs could be satisfactorily traced, there would still remain the more difficult question—Were they really those of a Wood Sandpiper? My own feeling is that they were; and it must be remembered that there is no inherent improbability in this view, for the species was, as a matter of fact, breeding in at least one county in Britain at the very time Thurnall found the eggs under consideration. That county was, of course, Northumberland, where Hancock's historic nest was discovered on the 3rd of June, exactly ten days after Thurnall's. It has to be noted, however, that Yarrell does not appear to have been so sure of the authenticity of the Elgin eggs as Bond was; and he does not even allude to them in the 3rd edition of his "British Birds," published in 1856, though he there takes notice of Hancock's record.

The only other instance of the supposed nesting of the Wood Sandpiper in Scotland is that related by Booth in his "Rough Notes," the locality being Gullane Links in East Lothian, and the date June 1867. But here again the evidence is incomplete.

The object of the above jottings is the elucidation of

Bond's oft-quoted statement as published by More. Should they meet the eye of any one in possession of information calculated to still further elucidate the subject, I trust he will not fail to make it known through the pages of this journal.

Since writing the above and sending it to the "Annals," I have received a piece of valuable information from Mr. Edward Bidwell, London, which practically sets the matter at rest. Mr. Bidwell writes me that in an old list of British Birds in which Bond made notes of his collection of eggs, the following entries occur under the head of Wood Sandpiper, namely:—

- 2, Scotland, C. Thurnall.
- 1, Tristram's sale, 1854.
- 3, Wolley's sale, 1855.
- 6, Holland, J. Baker.

"You may be sure," adds Mr. Bidwell, "that the eggs were those of the Wood Sandpiper, for Bond had a marvellous knowledge of eggs."

A NOTE UPON THE CHANGES OF PLUMAGE OF THE LITTLE GULL (*LARUS MINUTUS*).

By Rev. H. A. MACPHERSON, M.A., M.B.O.U.

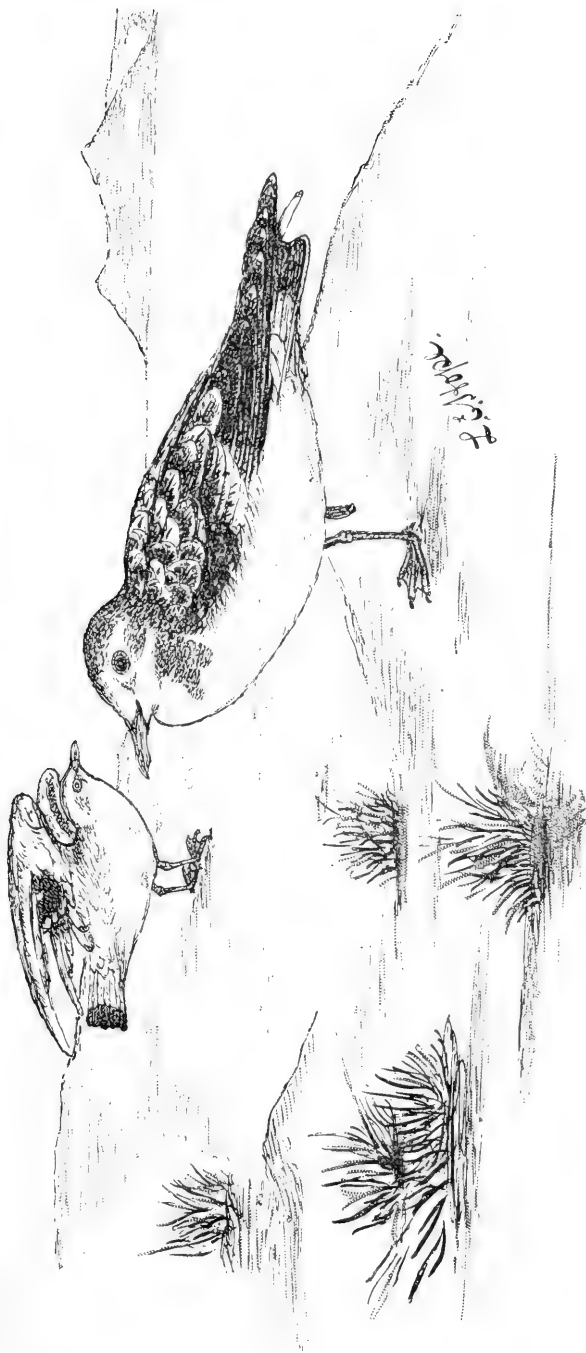
ALTHOUGH the Little Gull does not seem to have been found breeding west of the Baltic, it is a curious fact that individuals occur in the British Islands in almost every month in the year, and in nearly every stage of plumage; from the nestling which has only left the breeding-grounds of the species a few weeks, to the adult bird in full nuptial or complete winter dress. So far as my experience goes, the great majority of the specimens of *Larus minutus* that have been procured in this country were killed in the dress of the first winter, a phase bearing a certain resemblance to the coloration of the immature Kittiwake (*Rissa tridactyla*).

But before I attempt to explain the evolution of plumage which appears to characterise this diminutive sea-bird, perhaps I may be allowed to enumerate the specimens which have come under my notice since the autumn of 1893 in the neighbourhood of the Solway Firth. Of course the number may appear inconsiderable to East Coast naturalists; for the Little Gull is a comparatively rare bird at any time in Western Britain. In 1893 an immature bird was shot upon Rockcliffe Marsh by a man named Park, who procured it on the 25th of October. It was sent to me through the kind offices of the late Mr. A. Smith of Castle-town. It proved to be a female. On the 13th of January 1894 I received another immature bird, which had been killed by Irving Murray at Priestside, near Annan.

In June of the same year (1894) a single Little Gull made its appearance on the estuary of the Wampool and Waver, near Silloth. It associated with the numerous Brown-headed Gulls (*Larus ridibundus*), old and young, which were then clustering on the sands, and showed a partiality for the open portion of the widest creek upon Skinburness Marsh. After it had haunted the vicinity for a week or ten days, it was shot on the 29th of June by a fisherman, who mistook it for a specimen of Bonaparte's Gull (*Larus philadelphia*), which he only knew from the figure in Mr. Saunders' Manual. No Little Gulls came under my notice in 1895, nor did I hear of any in 1896, until the 16th of September, when a man named Peal brought me a specimen which he had just shot on the north side of the river Esk, opposite Rockcliffe Marsh. This bird, when first observed, was hovering over the water very much like a Tern,—so he said,—and appeared to be in pursuit of winged insects. Upon dissecting this specimen, I found a single beetle in its stomach.

On the 9th of October, in the same year, my friend Mr. Thomas Mann shot another Little Gull on the coast near Allonby (where I now reside). He told me that the flight of this bird, which he most generously presented to me, resembled that of a Tern rather than that of a Gull. I neither saw nor heard of any Little Gulls in 1897. But in January 1898, Peal the wild-fowler shot another Little Gull

on the open coast near Bowness-on-Solway. This he disposed of to Mr. W. Mackenzie, as he thought that we had enough Little Gulls already in the Carlisle Museum. A seventh specimen was killed during the last days of October 1898; *not*, indeed, upon the Solway Firth, but upon the Eden, which is one of the chief tributaries of this firth. This bird was shot near Nunwick by the keeper of my friend Mr. R. Heywood Thompson. I understand that it was accompanied by another bird of the same species, which escaped destruction. Other local specimens of *Larus minutus* are recorded in the "Fauna of Lakeland"; but I do not wish to refer to them now, because the specimens just enumerated as taken *locally*, between 1893 and 1898, suffice to illustrate the principal stages which *Larus minutus* appears to pass through. In extreme youth, as exemplified by the bird shot 16th September 1896, the Little Gull wears a brown and white dress, rather suggestive of *Larus ridibundus* in early life. The bird just mentioned has the forehead white; crown light brown, occiput rich dark brown, upper back dark brown sprinkled with a few pearl-gray feathers; centre of back white; lower back dark brown, each feather being white at the base; upper tail-coverts white tipped with dusky brown. The scapulars are dark brown, narrowly edged with pale buff, and one or two gray feathers are present; primaries black above, marked with white on the inner webs; secondaries white with blackish central shaft-stripes; tail white barred with black; chin and lower parts pure white, except the dark brown patch in front of each wing. We reach a slightly more advanced stage in the bird killed near Allonby on 9th October 1896. The crown is now white as well as the forehead; the warm brown of the occiput and hind-neck have become paler, with fine light edges to the feathers; the dark mantle is now profusely mottled with pearl-gray feathers; the scapulars are still dark brown. The dark patch in front of each wing has grown fainter in colour, and is less prominent. The third bird, viz. that shot near Nunwick at the end of last October (1898), retains more nest plumage than is usually found at such a late period of the autumn. The ear-coverts, which are rich brown in the first-named, and slightly marked in



LARUS MINUTUS.

Drawn from the birds obtained on the Solway Firth on September 16, 1896 (nestling in foreground), and June 29, 1894.
Both birds presented to the Carlisle Museum by H. A. Macpherson.

the second, have become deep iron-gray, as has the occiput; the crown and forehead are conspicuously white; the dark brown scapulars still persist; the dark patch of brown present before each wing in the two youngest specimens has now disappeared; the remains of the brown hind-neck form a dark bar extending towards the wings. This latter character is well defined in the fourth bird, shot on the 25th of October 1893, in which the dark bar just mentioned has become quite black, while the feathers covering the fore-arm have become blue instead of dark brown; a few of the scapulars are still dark brown, but the forehead is pure white and the crown and ear-coverts have become iron-gray. The mantle is chiefly pearl-gray, and the upper tail-coverts are pure white, though the lower back is still black. The bird killed on 13th January 1894 has the forehead white, but the occiput and ear-coverts are iron-gray, almost black; the hind-neck and mantle are pearl-gray, mixed, however, with more dark feathers than are present in the bird of 25th October 1893. Any dark feathers that persist have changed from deep brown to black. The sixth bird retains the dark wing-coverts; otherwise, the entire upper surface resembles that of the adult in winter. I think that this bird, shot in January 1898, was in its second winter, and would have worn immature dress until the summer of 1898; when it would have commenced to moult into full adult winter dress, passing for the first time into full nuptial garb, with the black head and red legs, in the spring of 1899. This conclusion is based, partly, upon the plumage worn by the bird shot on 29th June 1894. This bird has the forehead, crown, and hind-neck pure white; occiput pearl-gray mixed with iron-gray; ear-coverts black; the lesser wing-coverts are pearl-gray, but most of the greater coverts are still dark brown, though new pearl-gray feathers are moulting in; the mantle and scapulars are, of course, pearl-gray, and the lower parts are white. Perhaps the most interesting point about this bird, is that *it is moulting in* new inner primaries, pearl-gray above bordered with white, and black on the under-surface. This is shown in the bird drawn with a raised wing (see illustration).

The secondaries, and the remaining primaries, are similar

to the immature birds already described, save only that, in the June bird, the white tips of these feathers have become obsolete, or nearly so, by wear. The tail is still barred with black; but the *fork* of the tail, which is such a well-marked feature of *Larus minutus* in early youth, though sometimes forgotten, has virtually disappeared. The lower parts are no longer plain white; they are tinged, in the fresh bird, with a lovely pink hue. I believe that this bird, obviously a non-breeder, was bred in the summer of 1892; and that, having spent its first year, and the winter following, in immature dress, it *commenced* in the summer of 1894 to assume mature plumage, though not the plumage of the nuptial season, but that of the first *adult* winter. In other words, the Little Gull wears nest plumage for the first two or three months of its existence, but assumes the plumage of "the bird of the year" in the first autumn, and retains this with modifications until it is two years old; it then begins to change the wing quills, as a preliminary to passing into full *winter* dress in the following autumn. The feet of the Little Gull probably become red during the third winter. At all events, the feet of the bird killed on 29th June were not red but flesh-coloured, as in the younger birds which I have examined in the flesh. I have not seen a bird *assuming* summer full breeding livery, though I have examined a bird killed after the black head had become donned. Mr. W. Evans reminds me that he has recorded a Scottish specimen obtained, in the act of assuming nuptial dress, on 11th May ("Annals of Scottish Natural History," 1897, p. 194). In this bird, "the tiny black feathers, just bursting through their sheaths," made it apparent that in one instance, at any rate, the hood would have been acquired by an actual moult, and not by the old feathers changing from white to black. It will of course be understood that, though I have only referred directly to some eight specimens in all in this little paper, I have nevertheless examined a good many others, which either were not local, or were in one or other typical stage of plumage, and therefore of no particular help in tracing the evolution of this exquisite *oiseau de mer*, from its first brown and white dress to that of the adult, with its jetty hood and pale ash-gray mantle. Almost every Little Gull that has been obtained in Lakeland

has been procured within a short flight of the Solway Firth. Some specimens have been obtained when frequenting arable land, others on the banks of our rivers, and others again upon the sandy flats of the upper reaches of the Firth. But the species is at all times one of our rarest visitors.

NOTE ON THE OCCURRENCE OF *ANABOLIA NERVOSA* IN JUNE, WITH REMARKS ON THE EFFECT OF ALTITUDE ON THE TIME OF APPEARANCE OF INSECTS.

By KENNETH J. MORTON, F.E.S.

AT the end of June last I spent a few days at Uddingston, on the Clyde, and on the 26th of that month I captured, on the banks of the river, a Trichopteron which at the moment I did not recognise, as it was quite unlike anything usually occurring at that season. On examination, it proved to be a male of the autumnal *Anabolia nervosa*, perfect in all respects, and apparently just emerged. The other caddisflies which were out were *Leptocerus nigro-nervosus*, *L. annulicornis*, *Allotrichia pallicornis*, and other insects of early summer. The causes which led a species so decidedly autumnal to appear so far out of its due time are at present to me quite inexplicable. It is known that insects of autumnal habit, under ordinary circumstances, appear earlier in localities lying at some altitude than they do in lower-lying districts with milder temperature. The present instance cannot, however, be explained under this principle: the date is too early, and the locality practically at sea-level.

In connection with this record, it may not be out of place to make a few remarks on the principle just alluded to, as I am not sure that it is one fully appreciated by British Entomologists. The principle appears to be an operative one in Scotland, and it does not seem to be confined to species which are strictly autumnal, but it also exists amongst insects which may be considered as belonging rather to summer. Of course due allowance must be

made for favoured localities: these do not affect the general question.

Two instances came under notice in the Aviemore district in the summer of 1896.

In the early part of July, *Emmelesia minorata* was flying in worn examples on the slopes of the Cairngorms, and the species seemed to be getting over. But just before I left the district at the end of the month, it began to appear in profusion and perfection at a locality much lower down, not far from Loch-an-Eilan. This is doubtless the locality referred to by Tunaley ("Proc. South Lon. Ent. and Nat. Hist. Soc.," 1897, p. 5), who visited the district that summer from the 29th July.

The other species was *Erebia æthiops*. Tunaley (*op. cit.* p. 4) says, with regard to this species: "After the 21st of August the insect was *passé* in the lower glades, although it was taken on the higher slopes until the 8th of September. Indeed, one could have divided the locality into a series of ascending zones corresponding with the appearance of successive broods extended over a period of six weeks." This seems to give an entirely misleading idea of the sequence of emergence. *E. æthiops* appeared at one of the highest points of its occurrence near Aviemore as early as 2nd July, certainly very much earlier than it did in some of the lower glades there, and also, I am informed, very much earlier than it did near Forres, about sea-level. The term "higher slopes," used in speaking of the Aviemore district, might be misconstrued: *E. æthiops* is not an inhabitant of the higher slopes of the hills at all, although Dr. Buchanan White's maximum of about 800 feet is, without doubt, sometimes exceeded.

Regarding autumnal insects, a good illustration is given by King ("Trans. Nat. Hist. Soc. of Glasgow," 1886, p. 362), who has recorded a Trichopteron, *Halesus auricollis*, Pict., from the higher part of Glen Tromie, on 27th July. This species is a strictly autumnal one in the lowlands, and has never come under my own notice earlier than September.

Further instances could be added without difficulty, but, in the absence of written notes regarding them, I refrain from doing so. It may be more useful to give some

remarks bearing on the subject by two Continental Entomologists of repute.

My valued correspondent and friend, Dr. Ris of Rheinau, Switzerland, records ("Mitt. Schweiz. Ent. Ges.," Bd. 9, Heft 10, p. 441) that he captured *Chatopteryx Gessneri*, a Trichopteron, at Airolo on 27th and 28th September, while the insect did not appear for about a week after at the lower locality of Mendrisio. In connection with this, Dr. Ris makes the general statement: "Die Spatherbstthiere im milden Tiefland in der Regel später erscheinen als in rauhern Gebirge."

In response to inquiries whether the experience of Swiss Lepidopterists agreed with his own, Dr. Ris had the goodness to send me data regarding the times of appearance of certain *Lepidoptera* in different Continental localities. These were kindly provided by Dr. M. Standfuss of Zürich, and the information seems to me to be so interesting that I give it here in full:—

	Parchwitz bei Liegnitz (Silesia), N. German Plain.	Zürich, Switzerland.	Riesengebirge, Silesia (1100 m.).	Swiss Alps (1500 m.).	Monterotondo.	Besicza (Southern Hungary), Banat.
<i>Bombyx populi</i> , L.	Mid Oct. to Mid Nov.	October, November	September, October	September, October		
<i>Bombyx catrix</i> , L. } (<i>everia</i> , <i>Knock</i>) }	Mid Oct. to Mid Nov.	October, November	September, October	September, October	Mid November	Mid Nov. to Mid Dec.
<i>Bombyx trifolii</i> , <i>Esph.</i>	Mid Aug. to end of Sept.	Mid Aug. to Mid Sept.	Mid July to end of Aug.	..	September, October	September, October
<i>Ptilophora plumigera</i> , <i>Esph.</i> }	..	Mid Oct. to Mid Nov.	September, October	September, October		
<i>Cheimatobia brumata</i> , L. }	Mid Oct. to end of Nov.	End of Oct. to beginning of December	Mid Aug. to beginning of October	August to beginning of October.		

Dr. Ris adds that, notwithstanding the difference of altitude, the climate of Zürich is very much milder than that of the Silesian plains. Parchwitz may be confronted with the Riesengebirge, and Zürich with the Alps.

It requires little reflection to see the advantage, or even necessity, of the early appearance of late autumnal species in higher latitudes and altitudes. They must appear while they may. It is perhaps more interesting, because the

necessity and advantage are not quite so obvious, to find that summer insects in similar localities are also subject to accelerating influences. With these species, it may be desirable that the young larvæ should be up to the usual standard of growth before their enforced earlier hibernation ; but this does not explain the earlier appearance of the perfect insects the following year, seeing the larvæ will usually resume feeding later in spring. In a single-brooded species having a considerable range in altitude and latitude, the time during which the vital processes can be active must be shorter in the colder than in the milder localities, and the loss of time in the colder must be compensated for by acceleration in development. This more rapid development probably accounts for the relatively small size of examples of certain species of *Trichoptera* from elevated Highland lochans compared with examples of the same species from lower levels. (If no such difference exist between examples of the same species from low and from high levels, and if the more rapid development of the high be taken as the normal, then may it not be inferred that the development of the insect is retarded at the lower levels by what may be termed a modified condition of æstivation?) When the acceleration is insufficient, the species must have reached the limit of its distribution in altitude or latitude, or, it must at least cease to be an annual insect. It is well known that some boreal and alpine insects fail to put in the cycle of their existence within the year.

To any one living in a hilly district, with time sufficient for the investigation of a fairly large area, this subject presents a field for interesting work. Of course, it would be essential to base observations on insects found on their breeding-grounds, and not on mere stragglers wandering "up hill and down dale."

ÆSCHNA CÆRULEA, STRÖM, A BOREAL
DRAGON-FLY.

By KENNETH J. MORTON, F.E.S.

ÆSCHNA CÆRULEA was formerly commonly known by the name *Æ. borealis*, Zett., but Mr. M'Lachlan, in a recently published article on the subject ("E. M. M.," vol. xxxiv. p. 226), has shown in a satisfactory way that the name which was applied by Ström certainly refers to this species and has priority. For a long time it remained one of the less-known European members of the family, but recently it has been taken rather freely in our Highlands. It is one of our most interesting insects, and when alive and fully adult one of our most beautiful.

The first observation of its existence in this country was made by a Mr. Wilson, as recorded by De Selys in the "Revue des Odonates" (1850), where Wilson is said to have taken a specimen in "one of the Northern Counties," which specimen was presented by him to De Selys. Dr. Hagen's notice in his 'Synopsis,' published in the "Entomologist's Annual," 1857, was based on this, and the species was not made more particularly known as British until Mr. M'Lachlan found it in Rannoch in June 1864. From that time down to 1890 no further mention is found of it, and there was even a doubt expressed as to its survival. In the last-named year Mr. King and I took a few examples in Rannoch ("E. M. M.," vol. xxv. p. 383), and in 1895 I took it more commonly about the foot of Glen Lochay, also in Perthshire. In June of the present year Briggs, King, Porritt, and myself went to Rannoch, and when I left on 21st June *Æ. cærulea* was just appearing. From the reports afterwards received from these gentlemen, the species must have occurred in numbers which, in the light of former experiences, must be considered almost phenomenal.

In July last I again met with *cærulea* in Glen Lochay, much more commonly than in 1895, and I was enabled to observe it over a wider area than on my previous visit. It occurred at least 7 miles up the Glen, and in one of the

lateral valleys went right to the watershed between Glen Lochay and Glen Lyon. There is therefore little doubt that it occurs in Glen Lyon, as I indicated ("E. M. M.," vol. xxxi. p. 260) it probably would. It was also found quite near the watershed between Glen Lochay and Glen Dochart, and although it may not be quite safe to assume that it also occurs in Dochart, there is no reason why it should not.

The area of its known distribution may be defined thus :

The north side of Loch Rannoch (including the lower part of the Ericht valley); how far eastward it goes on this line is uncertain, but westward it has been observed near Dunan. On the south side of the Loch it has been found chiefly about the Black Wood; but there is good reason to suppose that it is well distributed over the country due south of Loch Rannoch, passing into Glen Lyon, and thence to the south side of Glen Lochay.

Beyond these limits, it is impossible to conjecture what its range is. It was not met with at all during a month's stay in the Rothiemurchus and Glenmore district of Speyside in 1896, although I kept a special outlook for it; nor did Mr. King, who was in the district at the same time, see it then or on previous visits to this and to the Kingussie districts. From the country to the west and south-west of Rannoch and Glen Lochay it has so far never been obtained, King having failed to find it during sojourns at Glen Orchy and Dalmally in different summers.

Not only *Æ. cærulea*, but *Æ. juncea* and *Cordulegaster annulatus* range high up the hillsides, following the course of the burns to their sources. There is no physical barrier to a much wider distribution of *cærulea*; climate does not stand in the way, and its powers of flight are more than sufficient to carry it over any pass and to make it as widespread as the other two. But dragon-flies are very local.

The normal time of appearance of *cærulea* seems to be about the middle of June, although in some seasons it may be out rather earlier. In Glen Lochay, during the past summer, it was flying freely over the lower grounds up till about the 8th of July, when it practically vanished therefrom, although it continued to be seen over 1000 feet, both along the burns and on peat-bogs, until at least 25th July.

What caused it to change ground it is difficult to say. It may have been due to one or other (or all) of three causes :

(1) The intrusion of *Æschna juncea* into its feeding-grounds. One little glade, which must have been connected by a favourable route with a good breeding-place for dragon-flies, and in which I have seen three individuals of *cærulea* hovering round a big moss-covered stone facing the sun, was one day suddenly invaded by half a score of the larger species. (2) The warmer weather may have caused it, as an alpine or boreal insect, to seek the cooler heights ; or (3), most probable of all, when fully adult, it sought to be near its breeding-places.

In Rannoch this insect is usually found in the opener parts of the woods. In Glen Lochay there is not the same extent of woodland, and it seeks the shelter of the hollows down which the little burns run, where there are usually thickets or clumps of birches. In the latter district it has been observed to be especially fond of basking on light-coloured stones or moss, and it is indisputable that light-coloured clothing, white nets, and such things, in strong sunlight, are irresistibly attractive to this species, although its congener *Æ. juncea* is rarely lured by anything of the kind. *Æ. cærulea* is perhaps most susceptible to such attractions before fully adult ; later it becomes shy, and always, if any attempt is made to chase, it is difficult to capture, although its flight is more jerky and less powerful than that of *juncea*. I have never seen it carrying on the long-sustained hawking operations which the latter insect delights in.

I have indicated that in Glen Lochay *Æ. cærulea* is usually found near burns. But I do not think the species breeds therein. At present I am a little uncertain whether it breeds in the lochans amongst the hills or in the less constant waters of the peat-bogs ; more probably the former. Still, it was about the peat-bogs the last examples of the season were flying when taken—some old males, rather ragged in the wings, but with the blue colour of their bodies almost dazzling in its beauty. It is the preponderance of blue that serves at a glance to distinguish our insect from *juncea*. Old males of *juncea* have the blue markings sometimes very fine, but they are not nearly so extensive as in *cærulea*.

The Continental distribution of the species is: Scandinavia, in which country it extends far within the Arctic Circle; the Schwarzwald in Germany; and it has been found in one or two Alpine localities in Switzerland.

The primary object of this paper is to induce Scottish Naturalists to observe our dragon-flies, in order that the distribution of this species and others may be worked out. *Somatochlora arctica* is, I believe, not known from any other Scottish localities except Rannoch and Glen Lochay. *S. metallica* I have not heard of from any other locality than Dr. Buchanan White's original one in Strathglass. A number of other species recorded from Scotland by Hagen in his 'Synopsis' have never been seen by me from this country. It is not desirable that the claims of these to be included in our fauna should rest on information somewhat old and indefinite, and efforts should be made to confirm their presence by new and reliable records.

NOTES ON THE FLORA OF WIGTOWNSHIRE.

By G. CLARIDGE DRUCE, M.A., F.L.S.

AT the request of the late Mr. Hewett Cottrell Watson, in the year 1883 I visited Wigtownshire in order to compile a list of plants, as he had records of only a small number from the county. Accordingly, making Newton Stewart my headquarters, I spent nearly a fortnight in exploring the county; but a sprained ankle restricted my work considerably. In the same year, but later in the season, Mr. Charles Bailey also spent a few days in the county. The most interesting plant which I observed was that form of *Melampyrum pratense* which has all the flowers of a pure golden-yellow colour, which I found by the banks of the River Cree above Newton Stewart, and to which I gave the name var. *hians*. An interesting form of *Vicia sylvatica*, which I called var. *condensata*, was seen on the shingle at Port William, where *Crambe maritima* occurs. My list comprised the following plants:—

Species previously recorded in "Topographical Botany"	35
Observed by me :—	
Native Species	439
Aliens and Denizens	33
	<hr/>
	507
Varieties	35
Mr. Charles Bailey's additions :—	
Native Species	7
Casuals or Aliens	2
Varieties	2

Since that time Mr. J. M'Andrew has added many species, some of them being very interesting. These have mostly been published in the "Flora of Dumfriesshire" by Mr. G. F. Scott-Elliott in 1896.

In this Flora there are recorded 49 species presumably native and 6 introduced that were not seen by me on my first visit, although they had been already found in the county, chiefly by Professor Balfour, Dr. Greville, and Dr. M'Nab. In addition to these, 120 species (more or less) are added on records subsequent to my visit. There are also about 45 Casuals or Aliens.

In the "Annals of Scottish Natural History" Mr. Arthur Bennett has recorded, chiefly on the authority of Mr. M'Andrew, *Fumaria confusa*, *Rubus polyanthemus* (which is probably *R. pulcherrimus*), *R. Lindleianus*, *Leontodon hispidus*, *Ranunculus circinatus*, *Utricularia intermedia*, *Carex intermedia*, and *Dianthus deltoides*; but probably the last of these is not truly wild. *Bromus arvensis* is certainly only a Casual. Although these were published before the "Flora of Dumfriesshire" appeared, none of them are included in that work; but *Leontodon hirtus* is given. (Do both species of *Leontodon* occur?) Since the publication of the "Flora of Dumfriesshire," *Hieracium gothicum*, *H. auratum*, *Calamagrostis Epigeios*, *Hymenophyllum unilaterale*, and *Potamogeton lucens* have also been recorded in the "Annals."

In the papers on the "Topographical Botany of Scotland" Professor Trail gives *Sium latifolium*, *Daucus gummifer*, *Senecio viscosus*, as being recorded for the county, and, with some doubt either as to the correctness of the name or as to

being indigenous, *Ulex nanus*, *Hypericum hirsutum*, *Saponaria officinalis*, *Saxifraga oppositifolia*, *Inula Helenium*, and *Pulmonaria officinalis*. None of these are given in the "Flora of Dumfriesshire." On the contrary, Professor Trail does not give (among others) *Ranunculus auricomus*, *Aquilegia vulgaris*, *Papaver Rhæas*, *P. Argemone* (seen by me), *Reseda Luteola*, *Viola odorata*, *Stellaria nemorum* (seen by me), *Prunus domestica*, *Callitriche verna*, *Epilobium tetragonum*, and *Leontodon hispidus*. Some of these are undoubted errors. He queries *Stellaria palustris* and *Hypericum hirsutum*. I am credited in the "Flora of Dumfriesshire" with recording *Ranunculus Lenormandi* and *Tanacetum*, but I have no recollection of seeing them in the county.

Enanthe pimpinelloides of the "Flora" from Wigtown, which was recorded by Professor Balfour, is *Æ. Lachenalii*. In more recent times Mr. Charles Bailey has gathered *Rubus Scheutzii* at Castle Kennedy.

The total number of species therefore recorded for Wigtownshire stands somewhat as follows:—

Native Species, including Denizens and Colonists	. 668
Casuals, Aliens, etc. 91
	—
	759

In the late August of the dry summer of 1898 I spent a few days in the neighbourhood of Stranraer, when I noted between 400 and 500 species; but the great majority of these I had observed on the previous visit. Among the more interesting plants which I gathered are the following (* denotes those which appear to be new records; † indicates that the plant is of Casual or Alien origin):—

Ranunculus acris, *Linn.*, var. **Steveni* (*Andrz.*), forma *angustisecta hirsuta*, Freyn.—Roadside near Stranraer.

Caltha palustris, *Linn.*, var. **laeta* (*Schott.*).—Near Dunragit.

Cardamine pratensis, *Linn.*, var. **palustris* (*Peterm.*).—Dunragit and Lochnaw.

Teesdalia nudicaulis, *R. Br.*.—Not observed by me in 1883. I gathered in 1898, in the hollows on the sand dunes of Torrs Warren, growing in almost pure sand, and presenting, instead of a flat rosette of leaves, a somewhat globular rosette, anchored

by the tap-root to the sand, but in such a manner as to twist round in the eddies of wind. In fact it exhibited an early stage of that vegetative growth which reaches such a highly differentiated character in the "Rose of Jericho."

**Viola canina*, *Linn.*—Torrs Warren.

**V. Curtisii*, *Forst.*—Locally plentiful on Torrs Warren.

Stellaria nemorum, *Linn.*—In the policies of Lochnaw, and near Craigencross.

S. media, *Cyr.*, *var.* *major, *Koch.*—Stranraer.

Buda rupestris.—Portpatrick.

Hypericum Androsæmum, *Linn.*—Lochnaw.

H. elodes, *Linn.*—Torrs Warren.

Malva moschata, *Linn.*—Lochnaw.

Millegrana Radiola.—Torrs Warren.

Geranium sanguineum, *Linn.*—Somewhat local on the sands of Torrs Warren.

Erodium cicutarium, *L'Hér.*—This occurs as a small form with very finely dissected leaves on Torrs Warren, and is identical with one which is found on the Newcastle Sandhills of County Down. It is very near to, if not identical with, the *Erodium dissectum*, Rouy., in "Flore de France," vol. iv. p. 108.

Ulex Gallii, *Planch.*—Shores of Loch Ryan, etc.

*†*Melilotus officinalis*, *Lam.*—Stranraer.

Rubus nessensis, *Anders.*—Shore of Loch Ryan.

R. pulcherrimus, *Neum.*—Glenluce, Stranraer, Portpatrick, etc.

R. Scheutzii, *Lind.*—Near Dunragit.

R. Selmeri, *Lind.*—Near Stranraer, Lochnaw, and Portpatrick.

R. Sprengelii, *W.* and *N.*—Near Glenluce. Previously recorded by Mr. C. Bailey.

**R. danicus*, *Focke.*—Near Stranraer.

**R. infestus*, *W.* and *N.*—Near Stranraer.

**R. pallidus*, *Bab.*, not *W.* and *N.*—Lochnaw.

R. Radula, *Weihe.*—Glenluce.

R. corylifolius, *Sm.*—Stranraer, Portpatrick.

Potentilla palustris, *Scop.*—Torrs Warren.

Rosa spinosissima, *Linn.*—Torrs Warren.

*!*Pyrus intermedia*, *Ehrh.*—In the policies of Lochnaw, etc., almost certainly planted.

- Sedum rupestre*, *Huds.*—Near the lake at Lochnaw, probably introduced. This was recorded from here by Professor Balfour, but queried in the "Flora of Dumfriesshire."
- **Galium erectum*, *Huds.*—On the margin of a field near the road between Stranraer and Craigenross. I have used this name in the sense in which most of our British authorities would employ it. Herr Freyn considers it to be a form of *Galium Mollugo*, Linn., var. *erectum*, Beck, "Fl. Nieder-Oester," p. 1126 = (*G. erectum*, *Huds.*), sed panicula non angusta. He does not agree with the definitions given in Beck's "Flora," and prefers to refer this form to a variety of *G. Mollugo*.
- *†*Chrysanthemum Parthenium*, *Pers.*—Portpatrick.
- *†*Cichorium Intybus*, *Linn.*—Casual at Portpatrick.
- Lysimachia vulgaris*, *Linn.*—By the lake at Lochnaw.
- *†*Vinca minor*, *Linn.*—Planted in the policies of Lochnaw.
- **Gentiana baltica*, *Murbeck.*—On the sands of Torrs Warren.
- **Mentha verticillata*, *Huds.*—Near Craigenross.
- Galeopsis Tetrahit*, *Linn.*, var. **nigricans*, *Brébisson*, "Fl. de la Normandie," p. 246.—Stranraer, Dunragit.
- Dondia maritima* (*Sueda maritima*, Dumort.).—On Torrs Warren.
- Atriplex patula*, *Linn.* (*erecta*, *Huds.*)—Stranraer.
- **A. calotheca*, *Fries.*—On the shingle at Stranraer. Named for me by Herr Freyn.
- Polygonum aviculare*, *Linn.*, var. *vulgatum*, also a form between *vulgatum* and *psammophilum*, Beck, "Fl. Nieder-Oester," p. 232.—On the shingly coast of Loch Ryan, near Stranraer.
- *†*Rumex alpinus*, *Linn.*—Near Broadstone, Stranraer.
- Ruppia maritima*, *Linn.* Agg.—Stranraer.
- Carex paniculata*, *Linn.*—Dunragit.
- C. extensa*, *Good.*—Portpatrick.
- C. pendula*, *Huds.*—Policies of Lochnaw. Is this native here?
- **Glyceria plicata*, *Fries* (*Panicularia plicata*).—Stranraer.
- Bromus hordeaceus*, *Linn.*, var. **glabrescens* (*Coçs. et Germ.*).—Stranraer.
- **Hordeum murinum*, *Linn.*—On shingle at Stranraer. Perhaps a Casual.
- Catabrosa aquatica*, *Beauv.*—On shingle at Stranraer, and as a very minute form on the sands of Glenluce—the so-called var. *littoralis*, Parnell.

Agrostis alba, *Linn.*, var. **coarctata* (Hoffm.).—On the sands of Torrs Warren.

Festuca ovina, *Linn.*, var. **vulgaris*.—Torrs Warren.

F. rubra, *Linn.*.—A maritime form at Portpatrick, etc.

Osmunda regalis, *Linn.*.—Lochnaw, probably planted.

Equisetum maximum, *Lam.*.—Portpatrick, and as the var. *minus*.

On the shingle of Loch Ryan, near to Sheuchan Mill, several Casuals were seen. These probably owe their origin to the siftings of Eastern barley from the mill in question. Among them were:—**Medicago denticulata*, *Willd.*, **Melilotus indica*, *All.*, **Trifolium lappaceum*, *Linn.*, **T. repupinatum*, *Linn.*, **Trigonella Fœnum-græcum*, *Linn.*, **T. cœrulea*, *Ser.*, **Lathyrus Aphaca*, *Linn.*, **Vicia villosa*, *Roth.*, *V. lutea*, *Linn.*, **Lythrum Hyssopifolia*, *Linn.*, **Ammi majus*, *Linn.*, **Coriandrum sativum*, *Linn.*, **Galium tricornè*, *Stokes*, **Plantago Psyllium*, *Linn.*, *Phalaris paradoxa*, *Linn.*, **Santia monspeliensis*, *Parl.* (= **Polypogon*), **Hordeum marinum*, *Huds.*, and **Lolium italicum*, *Braun*.

It may be well to point out that there are earlier records than those given in the "Flora of Dumfriesshire" for, among others, the following species, nearly all of which will be found in my list of 1883:—*Coronopus Ruellii* (*C. procumbens*, Gilib., see "Top. Bot."), *Hypericum acutum*, *Monch.* (*H. tetrapterum*, Fries), *Malva sylvestris*, *Linn.*, *Ilex Aquifolium*, *Linn.*, *Ulex Gallii*, *Planch.*, *Rosa spinosissima*, *Linn.*, *Œnanthe crocata*, *Linn.*, *Myrrhis Odorata*, *Scop.*, *Torilis Anthriscus*, *Gærtn.* (*Caucalis Anthriscus*, *Huds.*), *Hedera Helix*, *Linn.*, *Lonicera Periclymenum*, *Linn.*, *Scabiosa arvensis*, *Linn.*, *Artemisia vulgaris*, *Linn.*, *Carduus crispus*, *Linn.* (acanthoides), *Fraxinus excelsior*, *Linn.*, *Ligustrum vulgare*, *Linn.*, *Convolvulus sepium*, *Linn.* (*Volvulus sepium*, *Junger*), *Myosotis versicolor*, *Reichb.*, *Lycopsis arvensis*, *Linn.*, *Veronica serpyllifolia*, *Linn.*, *V. Tournefortii*, *Gmel.* (*Buxbaumii*), *Plantago major*, *Linn.*, *Myrica Gale*, *Linn.*, *Phalaris canariensis*, *Linn.*, and *Agrostis alba*, *Linn.* The records of *Arctium minus* and *Primula veris*, attributed to the Rev. W. W. [not C. C.] Newbould were made by me, as to my knowledge he never botanised in Wigtonshire; but the latter species I did not myself see in the county.

Several critical forms, including the Euphrasiæ, collected by me this season are at present undetermined. Eleven native species, twenty-three Aliens and Casuals, and eight varieties were, however, added to the list. The native, or probably native, plants of the county, therefore, at present recorded number 679, and the Casuals and Aliens 115.

Atriplex calotheca, if correctly named, is especially interesting, as it will, I believe, be an addition to the Scottish flora.

[NOTE.—In respect of Mr. Druce's references to records in my paper on "Scottish Topographical Botany" in this journal, I have to thank him and all other friends that call attention to errors of commission or of omission. Those that have tried similar work will be the most ready to understand how difficult it is to avoid or detect errors in the enumeration and revision of districts denoted by numbers only, without the names as a check. I intend, in a supplement, to correct all such errors as I detect in my lists, or as are brought to my notice. I shall therefore be glad to receive information bearing on the distribution of plants in Scotland to add to numerous records already accumulated towards the preparation of the Appendix.

But without deferring till this is ready, I shall now account for those discrepancies between my paper and the "Flora" issued by Mr. Scott-Elliott in 1896.

Saponaria officinalis, Linn., has been substituted by mistake for *S. Vaccaria*, Linn., found in 74 as a Casual by Mr. M'Andrew. *Hypericum hirsutum*, Linn., is given with (?) owing to its being noted for 74 in Mr. Bennett's "Additional Records" for 1891, though not in the "Flora." *Saxifraga oppositifolia*, Linn., for 74† (?) read 77† (?). The query after † refers not to the specific identity of the plant, but to its claim to be regarded as native. *Sium latifolium*, Linn., for 74 read 75. *Daucus gummifer*, Lam., is given in "Topographical Botany," 2nd Ed., on Mr. M'Andrew's authority. *Inula Helenium*, Linn., is named as an introduced plant in 74 by Mr. M'Andrew in his "List of Wigtownshire Plants." *Senecio viscosus*, Linn., must be omitted, being due to an error in transcription.

JAMES W. H. TRAIL.]

PLANTS OF LISMORE.

By SYMERS M. MACVICAR.

THIS island is interesting from its position in Loch Linnhe at the western end of the Great Glen of Scotland; and for its geological formation, being composed of limestone, a scarce formation on this part of the coast, and almost limited to a few adjoining islets, and to small patches on the mainland close to its north-eastern extremity in Appin. The island lies north-east by south-west, its extreme length being nine miles. The larger part averages one mile in breadth, but, as it narrows towards the ends, the average of the whole island is about three-quarters of a mile. It contains about 4500 acres, or seven square miles. It is low lying; but the surface is uneven with depressions, and the jagged rock appears on the surface in many parts. There are a few eminences at the southern part, the highest being 417 feet in height, and towards the north end there is one of 275 feet. The shore is rocky, with small cliffs in places. The soil has long been noted for its fertility, the name, Lismore, meaning "the large garden."

Mr. J. Shankland, Achnacroish, who has kindly supplied information about the island, writes that it has always been maintained that there was much wood on it at one time, and that most of it was finally exterminated by being rooted out or cut down for the sake of cultivating the land. He also mentions that there is a seam of peat through the centre of the island from end to end where roots of trees can still be found, and that they lie at an average depth of seven to ten feet below the surface, mostly pointing in the same direction as if they had been blown down. There are few trees on the island now, but a fair quantity of shrubby growth is to be found in the rougher places.

The indigenous species are *Prunus spinosa*, L., very common, *Rubi* and *Rosæ*, *Pyrus Aucuparia*, Ehrh., *Cratægus Oxyacantha*, L., common among rocks, *Hedera Helix*, L., common, *Lonicera Periclymenum*, L., rather common, *Calluna Erica*, DC., scarce, and the only heath noticed, *Fraxinus*

excelsior, L., a few fairly large trees scattered over the island (some of which may have been planted), and several smaller ones among the rocks and small cliffs about the shores (there appears to be little doubt that the latter are native, and not merely seedlings from the possibly planted larger trees), *Corylus Avellana*, L., common, *Quercus Robur*, L., and *Salix aurita*, L., common.

In Walker's "Essays on Natural History," 1808, and in his "Economic History," mention is made of a large indigenous yew tree which grew on the sea cliff in the adjoining island of Bernera. It was cut down last century, and was of "sufficient size to form a large staircase in the house of Lochnell."

All the specimens seen of the following were undoubtedly planted:—*Sambucus nigra*, L., *Ulmus montana*, Stokes, *Betula pubescens*, Ehrh., *Alnus glutinosa*, Medic., *Salix viminalis*, L. About Kilcheran House, the most sheltered part of the island, there are good-sized trees of beech and sycamore. The "colonists" seen were *Brassica Sinapistrum*, Boiss., *Bursa pastoris*, Weber., *Viola arvensis*, Murr., *Spergula arvensis*, L., var. *sativa* (Bœnn.), *Chrysanthemum segetum*, L., *Senecio vulgaris*, L., *Sonchus oleraceus*, L., *S. asper*, Hoffm., *S. arvensis*, L., *Lamium purpureum*, L., *Euphorbia Helioscopia*, L. About houses and in waste places were *Ægopodium Podagraria*, L., *Anthriscus sylvestris*, Hoffm., *Galium Aparine*, L., *Artemisia vulgaris*, L., *Arctium minus*, Bernh., *Cnicus lanceolatus*, Willd., *Scrophularia nodosa*, L.; and by roadsides mostly were *Gnaphalium uliginosum*, L., *Taraxacum officinale*, Web., and *Plantago major*, L.

There are three lochs on the island, each about half a mile in length, their bottom being composed of a thick deposit of marl—ten to sixteen feet deep, according to the Old Statistical Account of 1791. The vegetation in the lochs is much encrusted with lime, especially among *Characeæ* and aquatic mosses. *Scirpus lacustris*, L., and *Phragmites* form tall masses at the sides in some parts, while in deeper water the yellow water-lily appears to be more common than the white one, this being the reverse of the usual order on this coast.

The flora of Lismore differs from that of most of the

islands of the Inner Hebrides to the north of it in the common occurrence of certain species which have a preference for limestone, and in the scarcity of those preferring peat. To the former cause is due the abundance of *Nasturtium officinale*, R. Br., and *Asplenium Ruta-muraria*, L., the occurrence of *Scolopendrium vulgare*, Symons, as a common plant, and the presence of *Helianthemum Chamæcistus*, Mill., which is not uncommon. It is more difficult to speak with certainty of the absence of certain peat plants without a more prolonged examination than I was able to make, but several of the common species which especially affect this soil were not seen.

I am indebted to Messrs. W. H. Beeby and Arthur Bennett for kind help with *Sparganium* and *Potamogeton*, and to Messrs. H. and J. Groves with *Characææ*.

An asterisk denotes a new record for v.c. 98, in which vice-county Lismore is included.

**RANUNCULUS DROUETII*, *Godr.* (confirmed by Messrs. H. and J. Groves).—Rare; stream at Loch Fiart. This species has also been found in the islands of Islay, Tiree, and the Outer Hebrides.

**ARABIS CILIATA* (?)—This puzzling plant occurs in small quantity on rocky banks at Achnacroish. I had previously gathered it in 1896 in Coll and Tiree, and it was referred to this species, but with some hesitation, by Mr. Arthur Bennett and by the Rev. E. S. Marshall. I lately sent specimens from the three localities to the British Museum for an opinion. In reply, Mr. J. Britten kindly wrote that they could not come to any definite conclusion about the plant. He was inclined to think that the two species [*A. hirsuta* and *A. ciliata*] were too closely allied to be tenable as species, and mentioned, “Your plant has not altogether the appearance of the Renvyle plant, of which we have two good sheets from Shuttleworth—that is smoother and slender, but I do not find any character by which to distinguish it. Syme’s character from the shape of the seeds does not seem to hold good. Your plant is quite the same as one gathered by Mr. Shoolbred in North Uist last July.” The Scottish plant would, I suppose, rather come under the var. *hispida*, Syme, if it were distinct from *A. hirsuta*.

HELIANTHEMUM CHAMÆCISTUS, *Mill.*—Not uncommon. Mentioned by Lightfoot in “*Flora Scotica*,” under *Cistus helianthemum*, as seen by him during his short visit to this island.

HYPERICUM ELODES, *L.*—Rather common. A very local plant in the Inner Hebrides. It is given by Balfour for Islay, by Mr. A. Somerville for Iona, and I have seen it in Tiree and Canna.

RUBUS DUMNONIENSIS, *Bab.*—Occurs here, as in Mull and parts of the West Coast mainland, as one of the most frequent brambles.

AGRIMONIA EUPATORIA, *L.*—Rare. Among shady rocks remote from houses. It has here all the appearance of being native, but it has been introduced into some places on this coast in former times for its medicinal qualities.

HIPPURIS VULGARIS, *L.*—Rather common. Very local in the Inner Hebrides. It is given for Islay by Lightfoot, as well as by later botanists; and it occurs commonly in Tiree.

CAMPANULA ROTUNDIFOLIA, *L.*—Very abundant. This is a local species north of Loch Linnhe. While common on the basalts of the islands and mainland, and occurring rather commonly on the Lewisian Gneiss of Tiree, it is absent from large tracts of the Dalradian schists of the mainland, or occurs very rarely, and usually as an undoubted introduction with grass seeds.

VERONICA ANAGALLIS-AQUATICA, *L.*—Common. As in Tiree, Coll, and the Outer Hebrides, this is the common plant, *V. Beccabunga* being rare. It is a very rare plant on the mainland north of Lismore.

EUPHRASIA BOREALIS, *Towns.*—Common and generally spread in uncultivated pastures. *E. BREVIPILO*, *Burnat and Grenli.*—Less common and more local than the preceding. *E. GRACILIS*, *Fr.*—Uncommon, probably owing to the scarcity of peaty soil.

SUÆDA MARITIMA, *Dum.*—Salt marsh near the Pier. No personal authority is named in "Top. Bot.," ed. 2.

**SPARGANIUM NEGLECTUM*, *Beeby.*—Mr. Beeby, after a careful examination of my specimens, considers that he cannot do otherwise than name them as this species; but as the fruit is not nearly ripe, and as it has not hitherto been recorded in Britain north of Yorkshire, he considers it desirable that ripe fruit should be examined. Its range in Denmark has, however, recently been extended northward to c. $56^{\circ} 25'$, and in Sweden to c. $56^{\circ} 10'$, while Lismore is c. $56^{\circ} 30'$. I found the plant in three localities on the island.

**SPARGANIUM MINIMUM*, *Fr.*—In a few localities.

LEMNA MINOR, *L.*—Rare. A rare plant on this coast north of Loch Linnhe.

- ALISMA PLANTAGO-AQUATICA, *L.*—Loch Fiart. The only locality on this coast to the north of Lismore from which I have seen it recorded is Tiree, where it is rare, and occurs as the var. *lanccolatum*, *Afz.*
- POTAMOGETON NATANS, *L.*—Rather rare. Loch Balnagown.
- *POTAMOGETON COLORATUS, *Hornem.*—Exit stream of Loch Fiart. Lismore and Coll are the only definite localities for this plant north of the Clyde. The apparent absence of the commonest pondweed of this coast, *P. polygonifolius*, is rendered more interesting by a remark of Mr. Fryer's in his "Monograph of Potamogetons of the British Isles," at present being issued, that "it is not a little remarkable that where *coloratus* abounds *polygonifolius* is seldom or never present."
- POTAMOGETON ANGUSTIFOLIUS, *Presl.* (*ZIZII*, *Roth.*) [?].—Loch Fiart. An interesting plant still under examination.
- *POTAMOGETON PRÆLONGUS, *Wulf.*—Loch Fiart. I have gathered this species in Mull and Skye, but it appears to be rarer in the islands than on the coast mainland, where it is to be found in most of the deeper hill-lochs which I have examined. It has not been yet recorded from the Outer Hebrides. Mr. Bennett informs me that there is a specimen of Sir W. Hooker's from Skye in the Kew Herbarium.
- *POTAMOGETON PERFOLIATUS, *L.*—Loch Fiart and its exit stream. Not an uncommon plant on the islands and mainland of this coast.
- POTAMOGETON PUSILLUS, *L.*—Loch Balnagown, etc. Occurs also in what is probably a luxuriant sterile state.
- CAREX TERETIUSCULA, *Good.*, var. *Ehrhartiana* (*Hoppe*) (*vide* Messrs. Beeby and Bennett).—Not uncommon in damp pastures. Neither the species nor its variety has been recorded from the islands north of this, but Dr. Shoolbred writes me that he found the former last year in the Outer Hebrides.
- CAREX PANICULATA, *L.*—Loch Balnagown. Rare on the islands to the north of Lismore, but occurring in Mull, Tiree, and the Outer Hebrides.
- *CAREX VULPINA, *L.*—Among wet rocks near the shore.
- *AVENA PUBESCENS, *Huds.*—Only a few plants seen.
- CHARA FRAGILIS, *Besv.*—Uncommon.
- CHARA ASPERA, *Willd.*—Common. This is the prevalent species, and is doubtless the *Chara hispida* which Carmichael gives for this island in Hooker's *Flora Scotica*.
- *CHARA VULGARIS, *L.*—Much less common than the preceding.
- *Var. LONGIBRACTEATA, *Kuetz.*—Loch Balnagown.

LICHENS AND MOSSES FROM CARSAIG,
ARGYLE.

By JAMES STIRTON, M.D., F.L.S.

THIS year, during the month of August and part of September, at Carsaig, near Tayvallich, I picked up a few mosses as well as lichens worth recording. This locality cannot be said to have a diversified flora, although the rock formation, as is well known, is diversified enough. The first peculiarity in plant distribution that attracted my attention while driving from Ardrishaig was the extreme luxuriance of *Cotyledon Umbilicus*, extending, as it did, for miles along the roadside, while here and there *Jasione montana* obtruded itself. The plant, however, which stamped almost a character to the vegetation was the lichen *Parmelia caperata*, which occurred in great profusion, its yellow or greenish-yellow colour rendering it very conspicuous. It was afterwards found in luxuriant fruit in several places. Besides this *Parmelia* I secured *P. conspersa*, *P. pertusa*, *P. cetrarioides*, *P. lævigata*, etc.

The first moss which arrested my attention was *Didymodon flexifolius*, with setæ just beginning to protrude. On the 20th September, two or three days before leaving the district, I secured specimens with abundant fruit, having about one in four capsules ripe. Under ordinary conditions of weather another month was amply sufficient to render the capsules fully ripe. Now Wilson in "Bryologia Britannica" states the period of maturing fruit as from February to April.

Along the sea-shore here, as elsewhere throughout the West Coast of Scotland, was found in abundance *Trichostomum mutabile* (I give Wilson's name as more familiar to me), along with its numerous varieties, culminating in *Tr. litorale* (Mitt.). For the last I have little regard as a species, and prefer ranking it under *Tr. mutabile*. More than 30 years ago I sent specimens of this variety from Tighnabraich to Mr. Wilson, who named it *brevifolium* of *Tr. mutabile*. I distributed, at that time, tufts of this variety

to several botanists. I scarcely see the justice of substituting for it the more recent name, *Tr. litorale* (Mitt.).

Another moss in this section was found for the first time, viz. *Tr. nitidum* (Lindb.). I can recognise the claims of this moss to specific distinction.

Another feature of the moss-flora of this region was the prevalence and luxuriance of *Dicranum Scottianum*. This moss usurps the place of *D. fuscescens*, which can scarcely be said to have secured a hold here. Closely associated with it, the tufts often growing in apposition, or, at times, intermingled, was detected another *Dicranum*. Amid the general resemblance of the two mosses, the latter was usually distinguished by its larger, more luxuriant habit of growth. In 1869 I detected a few stems of this *Dicranum*, and, in 1874, published a description of it under the name *D. Fergusoni*. It belongs to the same section as *D. congestum*, inasmuch as the leaves have cylindrical connecting tubes or pores. The following is a somewhat more detailed description:—

Dicranum Fergusoni forms large, rather lax tufts, 2 to 4 inches in diameter, and from 1 to 3 inches in height. Stems stout, sparsely dichotomous, rufo-radiculose; leaves erecto-patent or subsecund, rather glossy, slightly crisped when dry much as in *D. Scottianum*, slightly serrated on the margin near the apex or entire, lanceolato-subulate, margins incurved above; nerve stout, thick, projecting behind, $\frac{1}{5}$ to $\frac{1}{4}$ the breadth of leaf a little above the base, or, at times, a little broader, smooth behind, or only slightly nodulose near apex, slightly excurrent; cells near base long and narrow, .04 to .07 by .005 to .008 mm.; angular cells large, hexagonal, lax, brown; upper cells rhomboid, .009 to .016 by .005 to .008 mm. The cylindrical pores are seen in the lower third, more plentifully near the nerve, and are rather longer than usual; at times they may be detected higher up. These pores are most distinctly seen in leaves of the previous year's growth when the chlorophyll is non-granular or diffused. Barren.

This moss differs from its congener *D. congestum* in being much more robust, nerve nearly twice the breadth relative to leaf, the cells at base much narrower than in

Continental as well as Scottish specimens of the latter, the cells shorter near apex and in the excurrent nerve.

The other moss is a *Campylopus* which I had previously detected in 1871; but as the small specimen had been lost, and has not hitherto turned up, I refrained from publishing a description of it. It was rediscovered this year in considerable abundance on wet grassy slopes of one of the lesser hills near Carsaig, at an elevation of not more than 300 feet above sea-level.

Campylopus melaphanus, n. sp. In dense tufts, dark green above, almost black below; stems 1 to 2 inches high, pale brown in a young state, becoming dark brown afterwards, slightly dichotomous or fastigate near apex, slightly radiculose below, radicles pale; leaves erecto-patent, straight, frequently in cuspidate tufts at apex, for the most part black-tipped, concave throughout, toothed at apex; nerve half width of leaf near base, composed of two rows of largish pellucid cells in front, of a corresponding row behind of smaller pellucid cells, and of one intermediate row of small, dark, opaque cells. The cells of the posterior of the two front rows become often dark and nearly opaque, as do also, although less frequently, those of the back row. The wings at the basal angles of the leaves are dilated into auricles of large, thin-walled, colourless cells, which ultimately become slightly brown on the part next the nerve; the pagina, which nearly reaches the apex, is composed of cells which near the base are oblong, .018 to .028 by .01 to .014 mm.; above, near the apex, they are dense, .009 to .014 by .005 to .008 mm. The nerve becomes brown throughout, although the browning process is first perceptible at the apex.

This moss has a curious blending of characters belonging to both *C. flexuosus* and *C. Schwarzii*. The alar spaces exactly resemble those of the latter, as do, to a certain extent, a section of the nerve, and the colour of the radicles; the other characters resemble more or less closely those of the former moss. The blackening of the stem and nerve is a curious peculiarity, and would seem to connect the moss also with *C. atro-virens*. Indeed, the eye is first attracted to it by the black tips of even the young leaves.

Since writing the above, I have again gone over carefully my collection of *Dicrana* from Carsaig, and have alighted upon another whose characters cannot be reconciled to those of *D. congestum* or *D. Fergusoni*.

In this, the areolation approaches closely that of *D. Scottianum* as well as of *D. fuscescens*, viz. cells near base oblong, .03 to .04 by .007 to .011 mm., rapidly lessening in size upwards until, in the upper half, they are .006 to .009 by .005 to .007 mm., and densely packed together. The nerve is thick, and occupies about one-fourth the breadth of the leaf near the base; it tapers upwards and is lost a little below the apex, instead of being excurrent as in the other. The margins of the relatively shorter leaves are largely, and more or less sharply, serrated in the uppermost fourth as well as the corresponding back of the nerve nodulose. The alar spaces are well developed, and are composed of large brown cells with thick walls. In places the cylindrical pores are numerous, lateral as well as apical; and they are seen farther up the leaf than usual, even connecting the smaller cells. This moss may meanwhile be named *Dicranum subnitescens*.

Apart from the presence of pores, or rather tubes, this *Dicranum*, and probably the preceding one also, might merely be reckoned forms of *D. fuscescens*, just as *D. congestum* had previously been reckoned. The latter is now classified in a different section from *D. fuscescens*, viz. under that of which *D. scoparium* may be said to be the type. Whether the presence of these slender connecting tubes in any *Dicranum* should continue to mark such a sharp line of distinction is another question. Meanwhile I am compelled to follow the general trend of opinion and to act accordingly. I must confess, however, that I have not yet detected these tubes in the leaves of specimens of true *D. fuscescens*. In my opinion, the porous system of this section of the *Dicrana* requires thorough revision, not only as regards the existence of such tubes in other and different species, but also as regards their physiological significance. They are very slender, not more than .002 mm. in breadth, and are easily ruptured, hence their detached groupings. Their previous existence is supposed to be indicated by

minute mammillæform prominences on opposite cell-walls, although such prominences are not seen while the tubes retain their connections.

ZOOLOGICAL NOTES.

Proposed Memorial to the late William Macgillivray, M.D., LL.D.—William Macgillivray, Professor of Natural History and Lecturer on Botany in Marischal College and University, Aberdeen, died in Aberdeen in September 1852, and was buried in New Calton Burying-Ground in Edinburgh. To the present hour his grave is not marked even by an ordinary tombstone. There is nothing to indicate the spot save four low corner-stones, each bearing the letters "W. M."

This fact having been brought to light, it was resolved that an effort should be made to secure at least the erection at his grave of a memorial of so admirable a man and so eminent a naturalist.

Some months ago a meeting was called of all who cherish the memory of Dr. Macgillivray, which resulted in the appointment of a Committee charged with the duty of issuing a circular to his surviving students and others likely to be interested in the proposal, collecting subscriptions, and erecting a memorial at his grave, any balance to be spent in commemorating him also in Marischal College.

The Committee feel that no argument is needed to commend the present proposal. Many who had not the privilege of studying under him, or knowing him personally, are aware how greatly the works which flowed from his diligent pen promoted the study of Natural Science fifty years ago, and acknowledge that his great work, "A History of British Birds," has placed him in the front rank of British ornithologists. His posthumous work too, "The Natural History of Deeside," printed for private distribution by command of the Queen, although less widely known, is notable alike for the charm of its literary style, and the full and accurate scientific information it affords regarding the fine valley which it describes.

Soon after the Committee was formed, it became evident that they would be in possession of funds more than sufficient for the erection of a churchyard memorial, which must be simple if it would be in keeping with the character of the man to be commemorated. The proposal, which has been cordially received by the members of Committee as that which, above all, would have gratified Macgillivray, is to found a Macgillivray Gold Medal in the University

of Aberdeen, to be given as a prize to the best student in Zoology, Botany, or Geology; or to former students for the best original research work; or for the best series of specimens worthy of being placed in the Natural History Museum, or the Botanical Museum, of the University.

It is estimated that a sum of £250, or thereby, would be sufficient for both a becoming memorial at the grave and for such a medal.

Subscriptions may be made to the Rev. Dr. FARQUHARSON, Selkirk; or to the EDITORS of this Magazine.

Phoca grœnlandica on the Aberdeenshire Coast.—Mr. Sim, of Castle Street, Aberdeen, secured a skull of the Harp Seal, in August 1897, from Cruden Bay. The Seal had evidently been killed by blows on the head, and the occipital bones of the skull were badly broken, so that its length cannot now be given. The dentition was complete, and measured $1\frac{3}{4}$ inches in the lower, and $1\frac{7}{8}$ inches in the upper jaw. The length of the lower jaw is $3\frac{3}{4}$ inches, with the rami nearly parallel in front. The teeth are separate and arranged in a straight line, this alone distinguishing it from the Common Seal, *P. vitulina*. As this is a very rare mammal on the coasts of Scotland, I asked Mr. Sim to allow me to send a note of it to the "Annals."—WM. TAYLOR, Lhanbryde.

Supposed capture of a White Whale in the Tay Estuary.—The "Scotsman" for the 26th of November records that "there was landed at Dundee Fish Market yesterday a White Whale [*Delphinapterus leucas*] 4 feet 6 inches in length. The fish was caught at the mouth of the Tay by some Broughty Ferry fishermen in the morning, and is the first caught in the vicinity."

Being interested in the occurrence of this rare Arctic species in Scottish waters, we wrote to a valued correspondent at Dundee, asking him if he could kindly procure for us some further particulars concerning this interesting capture. To our great surprise, we were informed that the supposed White Whale was nothing more than an ordinary Porpoise (*Phocœna communis*)!

It appears to us to be highly desirable that correspondents and others who write to the public press should consult some authority before venturing to record creatures unknown to them. In this case a reference to any book on British mammals would have sufficed, and would have prevented the public from being misinformed and naturalists from being misled.—EDS.

Bird Notes from Tiree.—On the 23rd of September I observed a Curlew Sandpiper (*Tringa subarquata*) some distance from the shore and running along the margin of a small pool. It was very tame, and allowed me to get quite close to it. This is the first instance of its appearance in Tiree that I know of.

On the 12th of November, over 40 Bewick's Swans (*Cygnus bewicki*) were feeding in the ditches at the boggy end of the "Reef." They were scattered over a considerable area, and waddling up and down like ducks.

Migration has been much later here this autumn than usual. It is true a few species of migratory birds did arrive about their usual dates; but the great bulk of them were a month late—the White-fronted Geese (*Anser albifrons*) were about five weeks late. Three great movements of Golden Plover (*Charadrius pluvialis*) occurred: a big rush at the middle of September; another, not so big, about the middle of October; while the most pronounced of all took place from the 7th up to the 18th of that month.—PETER ANDERSON, Tiree.

Goldfinch in West Lothian.—On the 10th of December I saw three Goldfinches (*Carduelis elegans*) in Dalmeny Park. As this bird is very uncommon in the Edinburgh district, I send this notice of its occurrence to the "Annals."—BRUCE CAMPBELL, Edinburgh.

Hoopoe near Dunbar.—A Hoopoe (*Upupa epops*) was got near the beach, about three miles east of Dunbar, after the great storm which culminated on 17th and 18th October last.—D. BRUCE, Dunbar.

Kingfisher in West Ross-shire.—On the 10th of September a Kingfisher (*Alcedo ispida*) made its appearance on the river Broom, Lochbroom, and was seen for three weeks afterwards, but not since, though it may still remain. So rare is this bird here, that no one ever saw one before this year.—J. A. FOWLER, Inverbroom.

The Greater Spotted Woodpecker (*Dendrocopus major*) in the South-east of Scotland.—Among the more noteworthy of last year's bird-movements was the immigration of Greater Spotted Woodpeckers which reached our shores about the end of autumn. A few of these fine birds probably find their way to us from the Continent every autumn, but marked immigrations are usually separated by a good many years. The last movement on a scale equal to the present one took place in 1886. But the first place as a Woodpecker year in Scotland probably belongs to 1868: at any rate, its record of the senseless slaughter of this beautiful and useful species north of the Border is, fortunately, unsurpassed—Mr. R. Gray states that he himself examined upwards of sixty specimens. As has frequently been pointed out, these flights consist almost entirely of birds of the year, which are known by the presence of a patch of red feathers on the crown of the head. For a knowledge of the following occurrences in South-eastern Scotland last autumn (1898), I am indebted to the

columns of the "Scotsman," and to a few friends and correspondents who have been good enough to favour me with communications on the subject :—

- October 18.—An immature ♂, shot at Ayton, Berwickshire (J. Buglass).
 „ 21.—One seen in a wood near Melrose (G. S. Ferrier).
 „ 21.—One, immature, shot near Newport, Fife (J. T. Croall).
 „ 27.—One, an immature ♀, shot near Thurston, East Lothian, and another seen about same time (W. Anderson).
 „ last week.—One seen in Broxmouth Park, near Dunbar (D. Bruce).
- November 7.—One observed running about the thick trunk of a large elm in the grounds of Cameron House, Newington, Edinburgh, by Mr. Vipont-Anderson.
 „ 9.—One seen by Sir Thomas Gibson Carmichael, Bart., at The Inch, near Edinburgh; and one (probably the same bird) seen later on the same day in the adjoining grounds of Kingston Grange by Mr. T. Speedy. I visited these and other localities on the 11th (a very misty day), but could see nothing of the bird, though I twice heard a suspicious "tapping," apparently in Moredun grounds. Evidence of its recent presence was, however, distinctly visible on many of the trees, especially the aged planes, from whose trunks it had prised much of the semi-loose bark in search of insects, etc.
 „ 10.—One seen at Wauchope House, Hawick (W. Macmillan Scott).
 „ 15.—One seen in plantation near Aberlady, East Lothian (W. Saunders).
 „ 15 and 16.—One seen in Dalmeny Park, Linlithgowshire (B. Campbell).
- December 3.—An immature ♀ received by Small from Tulliallan.

In connection with these records for the South-east of Scotland, allusion may be made to the following occurrences in other parts of the country, namely: A bird shot at Tongue, Sutherland, on 22nd October (J. Box); one (of three) shot near Glenberrie, Kincardineshire, on 27th October (G. H. K.); and one received by Small from Forfar on 26th October. I hear of other records, which, I understand, are being communicated to the "Annals" by those in possession of the facts.—W. EVANS, Edinburgh.

Great Spotted Woodpecker.—In addition to Mr. Evans's notes we have received the following :—

BERWICKSHIRE.—One seen at Burnfoot on 14th October, another at Blackadder woods on 18th November. Nested again at Duns woods, where they are preserved.—CHARLES STUART, Chirnside.

FORFARSHIRE.—One seen in the woods at Colliston Castle, near Arbroath, on the 22nd of October.—T. F. DEWAR.

ABERDEENSHIRE.—One 10th October, and another 12th November, seen near Aberdeen.—L. G. ESSON, Aberdeen.

Two young birds shot on the 29th of October at Peterhead. In one of these the crimson was developing on the head.—WM. SERLE, Musselburgh.

Six have passed through the hands of Mr. George Sim; all but one birds of the year.

CAITHNESS.—One obtained at Scotscladder on 30th September, and a young male caught at Auchingill on 19th October.—LEWIS DUNBAR, Thurso.

One near Wick, 4th November.—J. SUTHERLAND.

European Hawk-Owl in Aberdeenshire.—On 21st November an excellent female specimen of the European Hawk-Owl (*Surnia ulula*) was shot by William Smith, factor on the Haddo House Estates. The bird weighed $11\frac{1}{2}$ ounces, expanse of wings $28\frac{1}{2}$ inches, length from beak to end of tail $14\frac{1}{2}$ inches. The stomach was filled with the bones and hair of mice. The chief external difference in this species from that of our native Owls are its long rounded tail and short wings. And the principal internal difference lies in the fact that the furcula is not complete, that is, it does not form the usual V- or U-shaped bone common to most other birds, but takes the form of two long bony processes, which are united to the anterior point of the sternal crest by strong tendons, each $\frac{3}{4}$ of an inch long. Two examples of the American Hawk-Owl (*Surnia funerea*) have been obtained in Scotland, and one supposed European Hawk-Owl in Unst.—G. SIM, Aberdeen.

Honey Buzzard in Aberdeenshire.—A young specimen of the Honey Buzzard (*Pernis apivorus*) was shot near the home farm of Kinmundy on 15th September, and sent to Mr. M'Boyle, Peterhead, for preservation.—G. SIM, Aberdeen.

Honey Buzzard at Peterhead.—There was shot at Kinmundy on 19th September an immature specimen of the Honey Buzzard (*Pernis apivorus*). The plumage was dark brown, with a slightly lighter shade on the cheeks, throat, and belly; there were three bars of a slightly darker colour on the under side of the tail feathers; these feathers likewise were tipped with gray. The plumage was very close, and when separated showed abundance of white. There was one shot at Pitfour in the same neighbourhood, probably a young male, seven or eight years ago, and is now in the possession of the gamekeeper there.—WILLIAM SERLE, Musselburgh.

Rough-legged Buzzards in East Lothian.—A fair number of Rough-legged Buzzards (*Buteo lagopus*) seem to have arrived in Scotland about the end of last autumn. In the vicinity of Dunbar one was fired at and wounded on 22nd October. Escaping for the time being into Broxmouth woods, it was finally captured there four days later. Mr. D. Bruce, to whom I am indebted for these particulars and for a photograph of the bird, obtained possession of it and has it alive still. Mr. Bruce adds that about the close of October and beginning of November he several times saw large Raptores on the wing in the Dunbar district—one, which he feels sure was a Rough-legged Buzzard, was being buffeted by crows near Drem. Three specimens of this species—all from one locality at the foot of the Lammermoors, south from Haddington—were received by Messrs. Small for preservation on 12th, 14th, and 19th November respectively, and Hope had one sent from the north of Scotland in the beginning of December. I suppose it is useless pleading with most gamekeepers to spare the lives of such fine birds.

Mr. Bruce also reports large numbers of "newly arrived" Short-eared Owls and Fieldfares about Dunbar during the week ending 5th November.—WILLIAM EVANS, Edinburgh.

Garganey and Gadwall in Aberdeenshire.—Seven specimens of the Garganey (*Querquedula circia*), and four of the Gadwall (*Anas strepera*), were killed at Pitfour on 22nd October.—G. SIM, Aberdeen.

Remarkable variety of the Black Grouse.—A young male Black Grouse was shot at Bowhill, in Selkirkshire, on the 11th of November, which is remarkable, since it shows a decided tendency towards albinism. The prevailing tint of this specimen is ashy-gray, darker on the back and sides of the breast, which are brownish-gray, and on the head and neck, which are blackish-gray. The wing-coverts, secondaries, and scapulars are faintly, almost invisibly, vermiculated with brown. A few of the neck feathers are edged with black. The wing spot is present, but, being only a little lighter in tint than the general coloration of the wing, it is not at all conspicuous.—WM. EAGLE CLARKE.

Spotted Crake at Dunbar.—About 11 P.M. on 18th October, what, from the description given me, must have been a Spotted Crake (*Porzana maruetta*) came against the lighted window of the west signal cabin at Dunbar Station, and was captured by the men on duty, who kept it over night, and let it away in the morning. About the same time a Spotted Crake, possibly the same bird, was got at Dunbar Old Barracks.—D. BRUCE, Dunbar.

Baillon's Crake in Caithness.—When shooting here in September I obtained a female specimen of Baillon's Crake, which is now being set up by Mr. Dunbar of Thurso.—WM. ARKWRIGHT, Westfield Lodge, Thurso.

Little Bustard in Aberdeenshire.—On the 24th of October last, when out shooting partridges at St. Fergus,—part of the Pitfour estate in Aberdeenshire,—I shot a bird which the Pitfour keeper and Mr. Sim the Aberdeen naturalist have pronounced to be a Little Bustard (*Otis tetrix*). The bird was first seen in a turnip-field. It got up out of shot, and flew with a slow, leisurely flight. It seemed to be weak, as if wounded. I went after the bird and secured it. Mr. Mutch, the keeper, when skinning it found a swan-shot embedded in its thigh. It may be mentioned that for about ten days before, N.E. gales of unusual severity had prevailed on this coast. This may account for the presence of so rare a visitant. Mr. Sim remembers one other having been got near Aberdeen a good many years ago.—J. G. WALKER, London, W.

Gray Phalarope on the Solway Firth.—A small specimen of this Phalarope was brought to me at the Carlisle Museum on 10th December, when I ascertained that it had been shot on the coast near Cardunock the previous day. No doubt it had been driven up the estuary by the strong S.W. winds. It was *not* in full winter dress, as one would have expected a December specimen to be. On the contrary, the upper parts still retained a large proportion of the first feathers; so that it might well have been procured in September in the same garb. A fine old bird which was procured locally on the 24th of December 1894, and added to the same collection, *is* in perfect winter livery, except that it still retains a single feather of the red summer dress upon the rump.—H. A. MACPHERSON, Allonby, Cumberland.

Solitary Snipe near Elgin.—A specimen of the rare *Gallinago major*, rare at least in the north of Scotland, was shot on Saturday 15th October 1898 by Mr. J. Brander-Dunbar at Pitgaveny, near Elgin. The bird rose out of a fairly dry grass park, along with a Common Snipe. It had a scar on the breast, probably done against a wire fence or telegraph wire. I weighed it on the following Monday morning, and found its weight was exactly 8 oz.—T. E. BUCKLEY, Inverness.

Spotted Redshank, Ruff, and Curlew Sandpiper in East Renfrewshire.—We have had great hopes of adding something to our list of East Renfrewshire birds this autumn, owing to the considerable sheet of water known as Balgray Dam being very low—leaving a great portion of the bed of the dam exposed. In this we have not been disappointed. The Curlew Sandpiper (*Tringa subarquata*), of whose appearance on fresh-water lochs in Scotland there are few or no notices, was again observed (and see "Annals," 1897, p. 124) this autumn, between 25th September and 23rd October, both inclusive, never more than three birds being noted at one time. A Ruff (*Machetes pugnax*), apparently a bird of the year, a species we have

not previously observed here, although it has been shot on one occasion ("Annals," 1895, p. 229), was seen between the same dates. This bird was often seen within the period indicated, and admitted of a very near approach. A Spotted Redshank (*Totanus fuscus*) was also identified on the 16th of October, and was again seen on the 22nd, 23rd, and 30th *idem*. The great extent of mud exposed, and the absence of bushes and reeds, presented conditions suitable for this species. The Spotted Redshank proved to be much more wary than the Ruff. There were no Common Redshanks about on any of the occasions on which it was observed, unless the last, and then only one bird. Its appearance was quite distinct, owing to the absence of the band of white on the secondaries when seen on the wing; and when observed alongside the Ruff, as it was frequently, it was plainly a larger bird than the last named, with much longer legs. It was an exact replica in appearance of the bird in the foreground of the cut of this species in Yarrell, striking us at once as a very light-coloured bird, and we could always distinguish it easily in the company of Golden Plovers, etc., even at a distance. Unlike its congener, the Common Redshank, it appeared to be a silent bird, as we never heard it utter a note on any of the four days which we spent hunting it round the dam. We are not aware of any previous record of this species having been obtained or observed in "Clyde." It is, of course, an addition to our East Renfrewshire list.—JOHN PATERSON, JOHN ROBERTSON, Glasgow.

A Habit of the Black-headed Gull.—With reference to the Rev. Mr. Serle's note in the "Annals" for October regarding this Gull's habit of pattering with its feet in the shallows, I may mention that during the last twenty years or so I have, in the same locality, —Dalmeny and Cramond,—frequently noticed these Gulls acting similarly, and, as they always pecked at something after "beating time," I am inclined to think that their pattering was not altogether for diversion.—BRUCE CAMPBELL, Edinburgh.

Pomatorhine Skua on the Solway Firth.—Two immature examples of the Pomatorhine Skua (*Stercorarius pomatorhinus*) were shot on the shores of this Firth, between Annan and Gretna, on 26th October and 1st November. They were sent to me for identification, and have been retained for the Carlisle Museum. These are the third and fourth specimens that have been shot on our coast, and sent to me, in the last sixteen years. The first and second were older specimens, though not in full adult livery.—H. A. MACPHERSON, Allonby Vicarage.

Pomatorhine Skua in West Lothian.—After the severe gale last October, I picked up a Pomatorhine Skua (*Stercorarius pomatorhinus*) on the West Lothian foreshore on the 28th of that month. The bird was a quite recent specimen, but headless, and had been sorely battered about by the gale.—ROBERT GODFREY, Edinburgh.

Fulmar Petrel breeding on Noss, Shetland.—Last summer I found the Fulmar (*Fulmarus glacialis*) breeding on the Noup of Noss. This is the first breeding-station observed on the eastern seaboard of Britain, and, as such, marks a very distinct extension of the Fulmar's range.—ROBERT GODFREY, Edinburgh.

Some Scarce Fishes in the Solway.—Mr. Pool, of the Port Ling Fishery, has sent of late several species of fishes not regularly met with. One of these was a "John Dory" (*Zeus faber*), of which several examples have lately occurred in the Solway. Another was a very fine large example of the Horse Mackerel, or Scad (*Caranx trachurus*), a species I have not seen before from the Firth proper, though it is occasionally caught off the mouth of the Dee. A third species is of interest, as it has not, I believe, been recorded from the Solway, although locally abundant on some other parts of the West Coast, namely, the Sea Bream (*Pagellus centrodontus*).—R. SERVICE, Maxwelltown.

Four-bearded Rockling in the Firth of Forth.—On 25th October 1898 I picked up a perfectly fresh specimen of this fish on the shore between Leith and Portobello; it was full grown, being $13\frac{5}{8}$ inches in length—not much shorter than the longest British specimen recorded. The Four-bearded Rockling (*Motella cimbria*) was first recorded as British by Parnell ("Fishes of the Firth of Forth," p. 449), from a specimen caught on a baited line, a little to the east of Inchkeith, and has been obtained on several occasions in the Forth and elsewhere since Parnell's day.—ROBERT GODFREY, Edinburgh.

Occurrence of the Black-mouthed Dogfish off Aberdeen.—A Black-mouthed Dogfish (*Pristurus melanostomus*) was caught by trawl four miles off Aberdeen on 15th November, and was brought to me by Mr. Herbert Howell. It is a female, two eggs being in the oviduct ready for expulsion. These eggs or "purses" differ very widely from that of the Lesser Spotted Dogfish, being destitute of tendrils on the lower end, while at the other extremity they are little more than $\frac{1}{2}$ inch long. This is the first known instance, so far as I am aware, of this fish having occurred on the north-east coast of Scotland.—GEO. SIM, Aberdeen.

Rossia macrosoma (D. Ch.) and Eledone cirrosa (Lamk.) on the East Lothian Shore.—On 20th October last, immediately after the destructive storm from the east, I found a specimen of *Rossia macrosoma* among rejectamenta on the beach at Morrison's Haven a little to the west of Prestonpans. In Leslie and Herdman's "Invertebrate Fauna of the Firth of Forth" there is only one positive occurrence (at Aberdour) of this Cephalopod recorded.

On 28th October I examined, on the North Berwick and Dirleton beaches, no less than nine examples of the much larger *Eledone cirrosa*,

another Cephalopod of which there is only a single record in the above-mentioned "Fauna," namely the old one of Dr. M'Bain from Kirkcaldy Bay. Mr. T. Scott, however, mentions in the "Annals" for 1893 (p. 50) six occasions on which the species has been obtained by him at trawling stations in the Firth of Forth, so that it is probably not uncommon. The specimens I saw did not differ greatly in size. One measured fully 9 inches, excluding the arms ($14\frac{1}{2}$, including them), and weighed nearly $2\frac{1}{2}$ lbs.—WILLIAM EVANS, Edinburgh.

***Amara alpina*, F., and other Insects in "East Perth."**—

While staying at Fenderbridge, near the foot of Glen Tilt, Perthshire, last September, I collected a number of Coleoptera and other insects, among them being three specimens—two ♂'s, from one of which the species has been kindly determined for me by the Rev. A. Thornley, and a ♀—of the rare *Amara alpina*, F., a beetle which, I believe, has been recorded in this country only from Rannoch and Braemar. They were found on 8th and 17th September under stones embedded in a peaty soil, at a height of fully 1700 feet, on a hill a few miles up Glen Tilt. The same spot yielded a good many *Cymindis vaporariorum*,¹ *Pterostichus æthiops*,¹ *Harpalus latus*,¹ etc., and on a moor near the foot of Ben-a-ghlo I took *Carabus arvensis*,¹ *Miscodera arctica*, and *Harpalus quadripunctatus*, Dej.¹ (one specimen). On the summit of Carn Liath, within a few feet of the cairn (3193 feet), two specimens of *Otiorrhynchus maurus* occurred under a stone, and along with them an example of the commoner *O. blandus*, a beetle I had found in some abundance a year before in a very different locality, namely, on the Isle of May, at the mouth of the Firth of Forth. Near the foot of Carn Liath and Ben-a-ghlo, *Aphodius fœtidus* was abundant in sheep's dung. Among shingle on the north bank of the Garry, below Blair Atholl, a few *Coccinella 5-punctata* were secured on 9th September. I have not yet examined the Hemiptera very carefully, but among them are *Zicrona cœrulea* (one specimen from moor beyond Kirkton of Lude), and a number of *Cyrtorrhinus caricis*, Fall. (from margin of a loch a few miles east of Fenderbridge), a species I do not see in Mr. M'Gregor's list of Perthshire Hemiptera as published in the "Transactions of the Perthshire Society of Natural Science," vol. ii. p. 10. At the same loch a good Caddis-fly (*Limnophilus borealis*) was abundant on 7th September (see separate note by Mr. K. J. Morton, who identified this for me). The Plume-moth, *Alucita hexadactyla* (= *polydactyla*) was common in cottages and out-houses at Fenderbridge, and I noticed one in the station at Blair Atholl. As late as 6th September a few *Erebia æthiops* and a single *Lycæna artaxerxes*, all more or less worn of course, were still on the

¹ These are not noted as having occurred in "Tay" in Sharp's "Coleoptera of Scotland."

wing in the vicinity of the Falls of Fender.—WILLIAM EVANS, Edinburgh.

Sirex gigas in East Lothian.—Mr. William Fairbairn, Leaston, East Lothian, informed me orally last autumn of the occurrence of this insect in his neighbourhood, and on 10th October forwarded two specimens in proof of his statement; he had frequently observed these insects about the sawmill during the summer. Another correspondent in East Lothian sends me word of the occurrence of *S. gigas* near Gladsmuir, but has not favoured me with a specimen. The insect has already been recorded for East Lothian from Dunbar and Thurston ("Annals," 1892, p. 79).—ROBERT GODFREY, Edinburgh.

Sirex gigas in Peebleshire.—Last August, I captured a large female of this handsome insect at Stobo, where they have been established for a number of years. Mr. William Evans has also received two specimens this year from the same locality.—JAMES BAXTER, Edinburgh.

Sirex gigas in Solway District.—Only a few years ago this insect was prized as a great rarity. Now it has become comparatively common, and this year fully a dozen individuals have been in my hands. I also hear of it from many different localities, not only in these counties but throughout Scotland. It would not be surprising in a few years more to find the species a serious danger to timber. The larvæ are long-lived and make numerous galleries in living trees, utterly spoiling the timber for commercial purposes.—R. SERVICE, Maxwelltown.

Sphinx convolvuli, L., in East Lothian.—A specimen of this handsome Hawk-moth was captured while hovering over flowers in a garden at Haddington on 5th September 1898, and sent to me to name. Through the generosity of the captor, it now occupies a place in my cabinet.—WILLIAM EVANS, Edinburgh.

The Convolvulus Hawk-moth in Dumfriesshire.—*Sphinx convolvuli* has turned up as usual this autumn, though only as yet a single individual. This was sent me by Mr. Wm. Wright of Annan.—R. SERVICE, Maxwelltown.

Distribution of Pachnobia hyperborea in Scotland.—From what Mr. Barrett says in his book on British Lepidoptera, vol. v. p. 235, I gather that this beautiful species has not yet been recorded from any intervening localities between Perthshire and the Orkneys. It may be well, therefore, to mention that it occurs in the county of Inverness on the great range of the Cairngorms.—KENNETH J. MORTON, Edinburgh.

Pachnobia hyperborea, Zett., in Inverness-shire, etc.—In his "Lepidoptera of the British Isles," now in course of publication,

Mr. Barrett, I see, writes as if this moth were not known to occur in any county of the mainland of Scotland but Perth. I can myself vouch for its occurrence in Inverness-shire, having found the larva near Dalwhinnie in 1892; and there is a record of its occurrence near Braemar in Aberdeenshire in 1873 in the "Scottish Naturalist," vol. ii, p. 162. In Buchanan-White's "Lepidoptera of Scotland" it is noted as occurring in both "Tay" and "Dee." My chief object, however, in sending this note is to give what I do not find mentioned in any account of the moth I have seen, namely, the name of the "moss" in which the larvæ and pupæ are found. The plant is the *Racomitrium lanuginosum* of Bridel (= *Grimmia hypnoides*, Lindb.), a true moss, which grows in great profusion on the higher ridges and slopes of the Grampians and Cairngorms. Its broad, hoary cushions are favourite nesting sites with that most interesting bird the Dotterel.—WILLIAM EVANS, Edinburgh.

Limnophilus borealis, Zett., and **L. nigriceps**, Zett., from Glen Tilt.—I am indebted to Mr. William Evans for a fine specimen of *Limnophilus borealis* taken by him near Fenderbridge, Glen Tilt (East Perth). This species is exclusively northern in Scotland, and it seems to be decidedly local. Mr. M'Lachlan has kindly given me the following localities: Strathglass (Buchanan-White, 1869) and Strathnaver (Trail, 12th August 1873). Mr. King has also taken it somewhere between the Tummel and Glen Lyon. Abroad, its distribution is mainly boreal, and it is common in Northern Scandinavia. This year (1898) it was taken for the first time in the Vallée de Joux, Switzerland. From the same locality as *L. borealis*, Mr. Evans has given me an example of *L. nigriceps*, Zett., a species which is also somewhat local both in this country and on the Continent.—KENNETH J. MORTON, Edinburgh.

On the occurrence of Boreophausia inermis (Kroyer) and Thysanoessa longicaudata (Kroyer) in the Firth of Forth.—Some time ago I examined several unnamed Crustaceans belonging to the Euphausiidae that had been collected in the Firth of Forth at various times between 1891 and 1894. They were found to comprise representatives of four different species, the names of which are as follows: *Boreophausia raschi* (M. Sars), *Thysanoessa neglecta* (Kroyer), *Boreophausia inermis* (Kroyer), and *Thysanoessa longicaudata* (Kroyer). Though the first and second have already been recorded, the other two appear to be additions to the Crustacean fauna of the Forth. The specimens of *Boreophausia inermis* were collected in 1892 and 1894, and those of *Thysanoessa longicaudata* in 1891. *Boreophausia inermis* differs from *B. raschi* in having the rostrum narrow instead of triangular, and in having a spine over the base of the telson; *B. raschi* having no such spine. *Thysanoessa longicaudata* may also be distinguished from its near ally *T. neglecta* by not

having a spine over the base of the telson, while *T. neglecta* possesses one. It may also be remarked that the genus *Thysanoessa* need not be confounded with *Boreophausia* if the slightest attention is paid to difference in the form of the eyes and the length of the first pair of legs. *Boreophausia inermis* has been recorded from the Clyde and the Moray Firth, and also from Shetland; while *Thysanoessa longicaudata* has been recorded from St. Andrews Bay.—T. SCOTT, Leith.

On the occurrence of *Rhynchomyzon purpurocinctum* (*Th. Scott*) in the Moray Firth.—This well-marked Copepod was dredged by Mr. F. G. Pearcey in the Moray Firth in November 1897 at two widely different localities, viz. off Nairn and in the vicinity of Smith Bank. The thorax in this species is narrowly ovate, and the abdomen is elongate and slender; the last three thoracic segments are of a dark purple colour. The species was described in 1893, in Part III. of the "Eleventh Annual Report for Scotland," from specimens obtained in the Firth of Forth. It was described under the name of *Cyclopicera purpurocincta*, but Dr. Giesbrecht, in his revision of the Ascomyzontidæ, to which it belongs, removed it to a new genus as above. Though *Rhynchomyzon purpurocinctum* has been found in only a few places in the British seas, it appears to have a wide distribution, seeing that Dr. Giesbrecht has recorded it from Naples. It does not appear to be a littoral species, but seems to live at a moderate depth in the open sea.—T. SCOTT, Leith.

***Thalestris hibernica*, G. S. Brady, in the Cromarty Firth.**—This was one of a number of interesting Copepoda that were dredged near Invergordon in October 1896. It is one of the rarer species of British *Thalestris*. In the "Monograph of British Copepoda" by Professor G. S. Brady, *Thalestris hibernica* is recorded from Westport Bay, Ireland, and from the Clyde and Oban, Scotland; Cromarty Firth appears to be a new station for it. The form of the "hand" of the posterior foot-jaws is quite characteristic of this species when taken along with the fifth pair of feet in the male and female; it may also be distinguished by the student of this group of Crustacea by its peculiar "habitus" appearance.—T. SCOTT, Leith.

BOTANICAL NOTES AND NEWS.

Earliest Scottish Record of *Dryas octopetala*, L.—Martin, in his "Description of the Western Islands of Scotland" (1703), p. 180, mentions this plant in his account of Skye. His reference is:—"Cartophylata Alpina Chamedreos fol." It grows on Marble in divers Parts, about Christ-Church in Strath: Never observed before in

Britain, and but once in Ireland, by Mr. Hiaton. Morison's Hist. Ray Synopsis, 137." Lightfoot, in "Flora Scotica," also gives it for the same locality, "plentifully upon the limestone rocks of Ben-huardal, etc., in the parish of Christ-Church, in Strath-Swardles, in the isle of Skye." It still grows in some quantity on this limestone hill, which is given in the Ordnance Map as Ben Suardal. The Irish record mentioned by Martin is, I suppose, from the same locality as given in Mr. W. A. Clarke's "First Records of British Flowering Plants," "in the mountains betwixt Gort and Galloway [Galway]. Mr. Heaton," the date being 1650 and the reference How, "Phyt.," 120.—SYMERS M. MACVICAR.

Carex rostrata × *vesicaria* in Glen Callater.—Pffarrar G. Kükenthal has named a sedge as above which I gathered in 1882 at the head of Glen Callater, South Aberdeenshire. That it is a hybrid of *rostrata* I have little doubt.—G. C. DRUCE.

Deyeuxia stricta, *H. B. K.*, var. *borealis*, in Perthshire.—I notice in "The Flora of Perthshire," recently issued, that no reference is made to the real discoverer of this interesting grass in Strath Tay in 1888, nor is its extinction in its original and, I am afraid, only station, as reported by me in the "Journ. Bot." for 1897, mentioned.—G. C. DRUCE.

Saxifraga grœnlandica, *L.*—Although the name is included in the Perthshire Flora, no locality is given. Professor Engler named the specimen on which the report is based, which I collected on Ben Lawers and reported to Dr. Buchanan-White.—G. C. DRUCE.

Characeæ from Scotland.—In 'Notes on British Characeæ, 1895-1898,' in the "Journal of Botany" (Nov. 1898), by H. & J. Groves, there are numerous records from Scotland. These are from various localities, a considerable proportion having been collected by Mr. S. M. Macvicar, in 1896, in Coll and Tiree (Mid Ebudes, 103). Subjoined are the various records, the name of the collector and the date being added after each district, except these islands:—

Chara fragilis, Desv., Ayrshire, *A. Somerville*, 1896; Cantire, *C. E. Salmon*, 1897.

var. *Hedwigii*, Aberdeen N., *J. W. H. Trail*, 1883.

var. *delicatula*, Westerness, *S. M. Macvicar*, 1895; Cantire, *C. E. Salmon*, 1897; Islay, S. Ebudes, *T. F. Gilmour*, 1898; Mid Ebudes.

C. aspera, Willd., Mid Ebudes, Coll and Tiree.

var. *subinermis*, Coll.

C. contraria, Kuetz., Tiree.

C. hispida, L., Isle of Gigha, Cantire, *A. Somerville*, 1898; Coll and Tiree; Orkney, *A. Somerville*, 1898.

C. vulgaris, L., Lismore, Argyle, *S. M. Macvicar*, 1898; Coll and Tiree.

var. *longibracteata*, Lismore, *S. M. Macvicar*, 1898.

var. *papillata*, Tiree.

Nitella translucens, Ag., Tiree.

N. opaca, Ag., Tiree.

In two plates are excellent figures of additions to British lists, viz. on pl. 391 *Chara aspera*, Willd., subsp. nova *desmacantha* (characterised by spine-cells *in groups* of three to five, instead of solitary or in pairs, and by more numerous cortical nodes, there being usually from fourteen to eighteen instead of from ten to twelve to each internode), and on pl. 392 *Nitella hyalina*, Agardh. (distinguished from all other species found in Britain by bearing secondary branchlets, usually one above and one below each primary branchlet). The *Chara* has been found in several localities in England, and is the prevalent form of *C. aspera* in Ireland, and it occurs also in Sweden and Bavaria. The *Nitella* is as yet known as British with certainty only from The Loe, near Helston, in West Cornwall; but it occurs almost throughout Europe, and in Africa, Asia, Australasia, and North America. Both plants should be looked for in Scotland.

CURRENT LITERATURE.

The Titles and Purport of Papers and Notes relating to Scottish Natural History which have appeared during the Quarter—October-December 1898.

[The Editors desire assistance to enable them to make this Section as complete as possible. Contributions on the lines indicated will be most acceptable and will bear the initials of the Contributor. The Editors will have access to the sources of information undermentioned.]

ZOOLOGY.

BIRDS OF THE MOUNTAIN TOPS. By Lieut.-Col. W. H. M. Duthie, R.A. *Trans. Perthshire Soc. Nat. Science*, vol. ii. part vi. (1897-98), pp. 191-196.—Principally devoted to an account of the nesting haunts and habits of the Snow Bunting, the Dotterel, and the Ptarmigan.

NOTES BY A NATURALIST ROUND DUNKELD. By C. M'Intosh. *Trans. Perthshire Soc. Nat. Science*, vol. ii. part vi. (1897-98), pp. 223-227.—This paper includes notes on some of the birds of the district.

LIST OF BIRDS OBSERVED IN THE DISTRICT OF MOFFAT, DUMFRIESSHIRE, FROM OCTOBER 1896 TO FEBRUARY 1897. By Bruce Campbell. *Zoologist* (4), vol. ii. pp. 507-508 (December

1898).—The list includes fifty-five species seen within four or five miles of the town during the period named.

A WHITE HEDGE-SPARROW. By Charles Kirk. *The Field*, 15th October 1898, p. 648.—An albino example shot at Uddingston, Glasgow, on 21st September.

MARSH TITMOUSE IN THE TAY VALLEY. Correspondence by Messrs. Wm. Evans and J. A. Harvie-Brown on this subject is printed in *Trans. Perthshire Soc. Nat. Science*, vol. ii. part vi. (1897-98), pp. 250-251.

LATE STAY OF SWIFT. By E. J. Ross. *The Field*, 8th October 1898, p. 608.—An example observed at Edinburgh on 29th September.

GREAT SPOTTED WOODPECKER IN ROSS-SHIRE. By Donald Cameron. *The Field*, 26th November 1898, p. 858.—Specimen shot at Westfield, Nigg, in October.

ICELAND FALCON IN SHETLAND. By "Thule." *The Field*, 15th October 1898, p. 648.—An example shot during the last week of September.

ROUGH-LEGGED BUZZARD IN EAST LOTHIAN. By W. Hay Newton. *The Field*, 19th November 1898, p. 837.—Specimen trapped on a grouse moor in November.

LONG-TAILED DUCK IN THE FIRTH OF FORTH. By H. W. Robinson. *The Field*, 3rd December 1898, p. 897.—Specimen seen on 26th November.

CAPTURES DURING 1898 IN THE GALASHIELS DISTRICT. By James C. Haggart. *Entomologist*, vol. xxxi. pp. 296-298 (December 1898).—This note refers entirely to Lepidoptera.

COLIAS EDUSA IN WIGTOWNSHIRE. By A. A. Dalglish. *Ent. Record*, vol. x. p. 279 (November 1898).—A male specimen captured at Stranraer on 29th August.

ABUNDANCE OF AGLAIS URTICÆ LARVÆ IN SCOTLAND. By J. A. Clark, F.E.S. *Ent. Record*, vol. x. p. 255 (October 1898).—Large numbers found on 23rd June at the Kyle of Lochalsh, and on 27th June between Pitlochry and Kirkmichael.

PHIBALAPTERYX LAPIDATA. By W. M. Christy. *Entomologist*, vol. xxxi. p. 243 (October 1898).—A specimen taken on 4th September at Badenloch, in Sutherlandshire.

ORTHOTÆNIA ERICETANA IN SCOTLAND. By C. T. Cruttwell. *Ent. Mo. Mag.* (2), vol. ix. p. 232 (October 1898).—Found abundantly on Ben Lawers; six specimens captured.

A NEW BRITISH FLEA: *TYPHLOPSYLLA SPECTABILIS*, SP. NOV. By the Hon. N. C. Rothschild, B.A., F.Z.S., F.E.S. *Ent. Record*, vol. x. p. 250 (October 1898).—Five specimens taken from the Bank Vole at North Berwick in September.

THE EURYPTERID-BEARING ROCKS OF THE PENTLAND HILLS. Final report of the Committee. *Brit. Assoc. Reports*, 1898 Section C (Bristol).

BOTANY.

THE FLOWERING PLANTS OF NOVAYA ZEMLYA, ETC. By Col. H. W. Feilden. *Journ. Bot.*, 1898, pp. 388-396, 418-436.—Is of interest to Scotch botanists in relation to our alpine flora.

REPORT OF THE MEETINGS OF THE BERWICKSHIRE NATURALISTS' CLUB FOR THE YEAR 1896. *History of the Berwickshire Naturalists' Club*, vol. xvi. pt. i., 1896, published in Nov. 1898, pp. 28-78.—Notices the rarer plants observed in Redpath Dean, Newham Bog, and Twizell, and the finer trees, especially Conifers, observed at Dryburgh and at Twizell.

CRITICAL NOTES ON SOME SPECIES OF CERASTIUM—*continued*. By Fred. N. Williams, F.L.S. *Journ. Bot.*, 1898, pp. 382-387.—Expresses the view (p. 386) that *C. arcticum*, Lange, is a "hybrid between two forms of *C. alpinum*," and says, "var. *Edmonstonei* is another obscure form."

CERASTIUM ARCTICUM, Lange. By Edw. S. Marshall. *Journ. Bot.*, p. 440.—Supports the specific rank of *C. arcticum*, to which "var. *Edmonstonii* clearly belongs."

HABENARIA VIRIDIS, VAR. BRACTEATA. By James Britten, F.L.S. *Journ. Bot.*, pp. 437-438.—Discusses a note in *Bot. Exchange Club Report* for 1896 (issued 31st August 1898) by Mr. Druce on a form named by him *bracteata* as a new variety, and said by him to be "the more frequent form in mountainous districts of Scotland." Mr. Britten calls attention to *H. bracteata* (Willd.) R. Br., treated as var. *bracteata* of *H. viridis* in Morong's "American Check List," issued in 1894. It seems to be marked only by the bracts being longer than the flowers.

CAREX SADLERI, LINTON, IN NORTH UIST. By W. A. Shoolbred. *Journ. Bot.*, p. 442.—Records discovery of a clump in July 1898, on North Lee Hill, of this sedge, first recorded from Corrie Kander as *C. frigida*, All., but in 1898 shown by Mr. E. F. Linton to be closely allied to *C. binervis*, and referred to this species by him as a variety.

NOTES ON BRITISH CHARACEÆ, 1895-98. By H. and J. Groves. *Journ. Bot.*, pp. 409-413, plates 391, 392.—An important paper, noticed more fully on p. 58.

LOPHOCOLEA SPICATA, TAYLOR, IN SCOTLAND. By W. H. Pearson. *Journ. Bot.*, p. 401.

SCALIA HOOKERI IN WEST INVERNESS. By W. H. Pearson. *Journ. Bot.*, p. 441.—Both these new county records for rare liverworts rest on specimens sent by Mr. S. Macvicar from Moidart.

BIOGRAPHICAL INDEX OF BRITISH AND IRISH BOTANISTS—FIRST SUPPLEMENT (1893-97)—*continued*. By James Britten, F.L.S., and G. S. Boulger, F.L.S. *Journ. Bot.*, pp. 443-446.—Includes Robert Lymburn (d. 1843), Paul Howard Macgillivray (1834-95), and Christina Ramsay (*née* Broun), Countess of Dalhousie (1805-33),—all natives of, or connected with, Scotland.

REVIEWS.

THE STRUCTURE AND CLASSIFICATION OF BIRDS. By Frank E. Beddard, M.A., F.R.S., Prosector and Vice-Secretary of the Zoological Society of London. (London: Longmans, Green, and Co., 1898.)

It is not a little remarkable that, among the almost countless works published in this country devoted to the study of birds, not one has been given to us on the important subject of their structure in relation to their classification.

Mr. Beddard's book is thus an especially welcome and a much-needed one, and supplies a real want.

The book may be said to be the work of three well-known specialists; for, as Mr. Beddard informs us in his Preface, his predecessors in the office of Prosector—Professor Garrod and Mr. W. A. Forbes—had contemplated writing such a work, and he has had the use and benefit of the various manuscripts and notes left by his late friends. These, added to his own numerous investigations, form the base upon which he has founded this meritorious work.

The book is written upon the lines that will prove most acceptable to ornithologists,—namely, systematically,—the main portion of its pages being devoted to an account of the structure of the various Orders.

The book opens with a sketch of the General Structure of Birds, and of the Renal and Reproductive Organs, the Cœlom, Circulatory System, Respiratory System, Muscular Anatomy, Osteology, Brain and Nervous System, and the Affinities of Birds. Then follows the systematic portion on the Classification of Birds, with an account of the anatomical structure of the Orders, and the

various characters by which they are defined. To this section no less than 375 pages are devoted.

The book is rendered more acceptable and instructive by the liberal use of illustrations,—there are no less than 252,—which are of extreme use as an aid to the technicalities described in the text.

“The Structure and Classification of Birds” is a most valuable contribution to zoological knowledge, and its usefulness to naturalists is extreme; for the work is replete with original information, and with extracts from contributions which were hitherto scattered far and wide over serial and other literature, British and Foreign. We have pleasure in highly commending the book.

A CLASSIFICATION OF VERTEBRATA RECENT AND EXTINCT. By Hans Gadow, M.A., Ph.D., F.R.S. Cambridge. (London: Adam and Charles Black, 1898.)

Dr. Gadow's “Classification of Vertebrates” is a useful handbook for zoologists. It contains diagnoses of the characters upon which the various Phyla, Sub-Phyla, Super Classes, Classes, Sub-Classes, Divisions, Orders, Sub-Orders, and Families of the Vertebrata are founded. It is needless to remark that the book is necessarily highly technical, but it is at the same time a mine of condensed information for the student and working naturalist. The work is printed on one side of the paper only, so that additional characters, the result of further investigations, and other notes, may be made on the opposite page. The reputation of the author is a sufficient guarantee for the excellence of the work, and for the accuracy of the data afforded.

WILD LIFE AT HOME: HOW TO STUDY AND PHOTOGRAPH IT. By R. Kearton, F.Z.S. Freely illustrated by Photographs taken direct from nature by C. Kearton. (London, etc.: Cassell and Company, Limited, 1898.)

Those who know Mr. Kearton's previous books, wherein are given some delightful pictures of animal life, and more especially of birds and their nests and eggs, will welcome yet another work of a similarly attractive nature.

In the little book under consideration, we have chapters devoted to the apparatus required for photographing zoological subjects, and general advice thereon. Other chapters treat the methods of obtaining pictures of mammals, birds, insects, etc.

Probably no one has had greater and more varied experience than the Brothers Kearton, and hence anything these most successful performers have to say on the subjects on which they treat bears the impress of authority.

The illustrations are about one hundred in number, and are some of the best of the kind we have seen.

A DICTIONARY OF BIRD NOTES. To which is appended a Glossary of Popular, Local, and Old-fashioned Synonyms of British Birds. By Charles Louis Hett. (Jackson's Brigg, 1898.)

This "Dictionary of Bird Notes" is a useful compilation. It is arranged under both the Notes and the Birds, and appears to have been prepared with some care. Unfortunately, however, a burlesqueness pervades the book, owing to an attempt having been made to render the notes and songs of a number of species by English words. Thus the "strange and weird note" of the Black-throated Diver is rendered by "Drink—drink—drink, the lake is nearly dried up." Fancy any one looking for a bird's note under "drink"! Such renderings as these are sheer nonsense, and they mar an otherwise useful and neatly got-up little book.

W. Wesley and Son, London, have just issued a "Catalogue of Natural History and Scientific Books" which gives a description and classified list of 1500 works and pamphlets on the Natural History of Great Britain and Ireland. The arrangement under the names of the English Counties, Wales, Scotland, and Ireland will be found of interest to collectors of local faunal works.

The Annals of Scottish Natural History

No. 30]

1899

[APRIL

A LIST OF THE BIRDS OF BERWICK-ON-TWEED,
WITH SPECIAL REFERENCE TO "THE BIRDS
OF BERWICKSHIRE," AND NOTICES OF THE
OCCURRENCE OF SOME OF THE RARER
SPECIES IN THE ADJOINING DISTRICTS.

By GEORGE BOLAM, F.Z.S., etc.

(Continued from "Annals," 1897, p. 88.)

WHITE WAGTAIL, *Motacilla alba*, Linnæus.—A difficult species to determine from descriptions merely, and is frequently confounded with its near relative *M. lugubris*, which renders some of the records of its having been seen very doubtful.

It has not been observed within our Bounds, though I met with a single example, on the turnpike side, near Lowlynn, on 12th April 1882. Dr. Charles Stuart thinks he has seen it by the side of the Tweed, near the Union Bridge; and the late Dr. Hardy believed he had once identified it near Old Cambus. About Dunbar, and on the East Lothian coast, it has been frequently observed as a spring migrant, and specimens have been obtained there.

PIED WAGTAIL, *Motacilla lugubris*, Temminck.—A common, and well-known species, the "Water Wagtail" of the district. To a limited extent resident throughout the year, breeding in our old walls, and on the sea banks, but the greater number move southwards in autumn. The beach, and rubbish-heaps, at the back of

the Pier, are favourite winter resorts, and a pair or two may generally be met with there, in company with the Rock Pipits, but the greater number move southwards in autumn, to return the following March. A nest in the wall, by the side of the pathway, below Castle Hills, contained three fresh eggs, on 8th August 1881.

GREY WAGTAIL, *Motacilla melanope*, Pallas.—Another partially resident species. A pair or two always nest on the Whitadder, within the Bounds, and in winter single birds, or a pair together, are not unfrequently to be met with along the river banks from the boathouse to Castle Hills, especially in very severe weather when their haunts, by the side of the inland streams, are frozen up. I have also occasionally observed them, about the rocks, on the sea coast, during hard weather.

BLUE-HEADED WAGTAIL, *Motacilla flava*, Linnæus.—I have seen this species in spring at no greater distance from our boundaries than Holy Island, and to the north it has occurred at Dunbar, but we have no records for the Borough itself.

YELLOW WAGTAIL, *Motacilla raii* (Bonaparte).—Not common upon the east coast, but occurs on both sides of the Border, on migration, in spring, and may possibly remain to nest in some places. I have only once observed it actually within our limits, and this was near "Dodds' Well" on 15th April 1888. On 5th May 1882, I saw one by the side of the Whitadder, below Clarabad Mill, which, though strictly speaking in Berwickshire, is within half a mile of the "Boundary Road." The Rev Charles B. Carr informs me that he shot a specimen, on a field, near Horncliffe Mill, a few years ago.

TREE PIPIT, *Anthus trivialis* (Linnæus).—A common summer visitor throughout both the adjoining counties, wherever hardwood trees are found. It delights especially in rather thinly wooded banks, and "the Plantation," on the side of the Tweed, below New-water Haugh, is never without two or three nests every summer, and this notwithstanding the fact that a brood can seldom be safely brought off there, owing to the bird-nesting proclivities of the boys of our good old town.

Locally the Tree Pipit is known as the Wood Lark, and Burns evidently had this bird in his mind, when he wrote the beautiful lines—

O stay, sweet warbling wood lark, stay,
Nor quit for me the trembling spray.

MEADOW PIPIT, *Anthus pratensis* (Linnæus).—A resident, and always common, though possibly most numerous about Berwick, in late autumn, when the migratory bands are passing. At that season, small flocks of this, and the next species, may be met with frequenting the heaps of decaying seaweed, and debris, behind the Pier, and

to the young ornithologist, on the look-out for rare Pipits, the various shades of browns and greys, or even olive-greens, presented by the different specimens is very confusing, while the *white* or *smoky brown* of the light pattern on the outer tail feathers is only one of degree, and often only to be settled by comparison. It is then that a watch must be kept for *A. cervinus*, *A. spipoletta*, and kindred species, but so far the search has been in vain.

ROCK PIPIT, *Anthus obscurus* (Latham).—A common resident, breeding on the sea banks, all along the coast, and seldom wandering inland farther than an easy flight from the rocks, except indeed by the sides of the Tweed, whose banks they follow up for a mile or two from the sea; their favourite feeding-place is always in the immediate vicinity of water.

RICHARD'S PIPIT, *Anthus richardi*, Vieillot.—Has occurred at Howick on the Northumberland coast (Hancock, "Birds of Northumberland and Durham," p. 58), but not nearer to Berwick, so far as I am aware.

SKYLARK, *Alauda arvensis*, Linnæus.—A well-known and abundant resident. In autumn and winter, Larks often collect in very large flocks upon the "Meadows" north of the town, and between the railway and the sea. Here they become associated in hard weather with Snow Buntings, Linnets, etc., with whom they have to share the dangers of the "gilderts," and snares, set by the boys, and birdcatchers, of the town. Cock Grey Linnets are the birds most sought after on these occasions, and hen Linnets and Larks are often allowed to escape, sometimes with the loss or disfigurement of their tails, but frequently alas! the poor Lark is carried home to end his days in a very small cage where, hung from some window in Walkergate Lane, or the Greens, the songster who erst "at heaven's gate sang," is fain to pour forth a stave or two of melancholy cadence to the passer-by. Our pity for the poor birds under these circumstances must, however, be tempered by the thought of how greatly their song must be appreciated by the children in those narrow rooms; and as a rule their owners in our back streets are most kind and attentive to the wants of their feathered friends. We never see caged birds more tame and contented than they are in the kitchens of the poorer classes, and after all have the dwellers in a town not more excuse for keeping such birds as the Lark in confinement than their more well-to-do neighbours, who can enjoy the wild bird's song every day round their country residences?

WOOD LARK, *Alauda arborea*, Linnæus.—An extremely rare casual visitant to Northumberland, and one scarcely likely to occur near Berwick. Selby records one, killed near Twizell, on 24th November 1827, which is probably the only satisfactory record for

the district. As has already been pointed out, the Tree Pipit commonly goes by the name of Wood Lark in the country.

SHORE LARK, *Otocorys alpestris*, Linnæus.—A casual winter visitant, which seems to have been more frequently noticed, within recent years, than formerly upon our coasts. It has occurred four or five times in the northern part of Northumberland, and in January and February 1895, I had the pleasure of seeing many individuals, on the shore, in the neighbourhood of Holy Island. On the 20th May 1880, the late Dr. Colville Brown told me he had seen a specimen, on the sea banks a little to the south of Scremerston Sea House, a day or two previously, a very late date to find this bird still lingering here.

As regards the Borough itself, the late Robert Gray ("Birds of West of Scotland," p. 118) refers to a specimen in the Millerstain collection, shot on Spittal sands, in 1840; and on 12th December 1885, my brother observed a single Shore Lark, in company with some of the common species, on the "meadows" about a mile north of Berwick. During the snowstorm of January 1897, I noticed two or three individuals about the beach, behind the Pier, and shot one of them, as a local specimen, on the 21st of that month. On the East Lothian coast, particularly about Dunbar, Shore Larks have been frequently seen and obtained, but up to the present time none seem to have been recorded for Berwickshire. It seems unlikely, however, that the intervening coast should be so entirely passed over, and were a stricter watch kept for them, it would no doubt sooner or later be rewarded.

In my experience these birds keep very closely to the shore, especially dry benty parts of it, and show a strong predilection to visit old bits of seaweed left dry above high-water mark. They also stray to the adjacent stubble fields, where they become associated with other kindred species, without, however, mixing indiscriminately with the flocks. The dark markings about the head are much more inconspicuous at this season than would be imagined, and it is rather the dark tail and the different note, as the bird takes wing, that is likely first to betray their presence.

PICARLÆ.

SWIFT, *Cypselus apus* (Linnæus).—A well-known summer visitor, nesting in considerable numbers under the tiled roofs of Berwick. In leaving their nests, it is some time before they can get thoroughly under weigh, and they often descend almost to the ground before they are able to recover themselves. I once knew a cat, which made a regular practice of lying in wait for, and springing at them, as they passed her, and upon one occasion at any rate, she captured a poor Swift; probably it was not her only successful attempt, for she seemed always to be upon the lookout.

A large number of Swifts breed in the loft, in the roof of Coldingham Abbey, gaining access through the latticed window at the west end. I have watched as many as twenty of the birds entering here at one time, and have been puzzled to think how they could gain their nests, probably on the wall-heads, or in crevices in the walls, in the very dim light which must prevail inside.

Another interesting problem regarding these birds, which has often struck me, is how and when do the young ones learn to fly? Numerous as they are with us, and often as I have watched their nesting-places, I never saw an individual which appeared to be at all weak upon the wing, nor ever knew one to alight anywhere except at its nest.

The earliest Swifts usually arrive in Berwick during the first week in May. In my records for over twenty years I find I have only three times observed them in April—viz. in 1878 on 26th; in 1885 on 27th; and in 1896 on 27th. In autumn most of them depart before the end of August, but a few commonly linger for a week or ten days later; while on three or four occasions I have seen single birds flying over the town in October, the latest date being the 14th of that month, in 1882.

ALPINE SWIFT, *Cypselus melba* (Linnæus).—Except the specimen shot on the Northumbrian coast, near Boulmer, on 18th July 1882, there is no record for the district, and I should, perhaps, scarcely have referred to this here, except for the fact that I was once told by a young friend that he had seen a large Swift off the sea banks, near Berwick, which he thought had a white breast. Of course it may, or may not, have been this species.

NIGHTJAR, *Caprimulgus europæus*, Linnæus.—A few pairs nest, in suitable localities, on both sides of the Tweed, and I have more than once seen individuals, in Berwick, on migration, in autumn.

RED-NECKED NIGHTJAR, *Caprimulgus ruficollis*, Temminck.—For the benefit of younger ornithologists, a passing reference may perhaps be permissible to Hancock's well-known record of this bird, at Killingworth, near Newcastle, on 5th October 1856, which is still, I believe, the only instance of the occurrence of this southern species in northern Europe.

GREAT SPOTTED WOODPECKER, *Dendrocopus major* (Linnæus).—Has, within recent years, quite re-established itself in many parts of the country, from which it had long since disappeared, and it now breeds, in several localities, in the Border counties. In 1868 there was a great influx to the neighbouring district, and in that year, the late Dr. Maclagan recorded having seen one near to Berwick. Since then it has several times been killed, or noticed, about the town, generally during the autumnal migration. I have two or three times had specimens from Holy Island, though the whole island does not boast a tree worthy of the name.

WRYNECK, *Lynx torquilla*, Linnæus.—Has several times occurred in East Lothian, and once or twice upon the Northumberland coast, within fifteen or twenty miles of Berwick, but I know of no nearer record.

KINGFISHER, *Alcedo ispida*, Linnæus.—In spite of the risks he runs at the hands of nearly every person carrying a gun, the beautiful Kingfisher still manages to maintain a footing in the neighbouring district, and breeds intermittently by the side of many of the Border streams. We have his presence at the mouth of the Whitadder, and on the Tweed, almost every autumn, and in winter I have occasionally met with single birds frequenting the rocks along the sea shore. A Kingfisher may sometimes be seen, exposed for sale, in the windows of the game shops in the town.

ROLLER, *Coracias garrula*, Linnæus.—Has frequently occurred in Northumberland, where I have examined several recently killed examples, generally young birds, obtained rather late in September. An adult male frequented the road, where it crosses the Carter Fell, for about a week previous to 4th July 1889, on which date it was shot by Job Simpson, gamekeeper to Mr. Pawson, at White Lee. It was in beautiful plumage, but on dissection the generative organs were found to be in a diseased state. A female was shot by Mr. Peter Cowe, at Scremerston Town farm, only a mile or two beyond the limits of the Borough, on 22nd September 1875, and is still in his possession. It was shot from a "stook," in a stubble field, and when opened, the stomach was found to be filled with beetles. ("Hist. Berw. Nat. Club," vii. p. 500.)

BEE-EATER, *Merops apiaster*, Linnæus.—In *The Field* newspaper of May 1897, Mr. C. J. Leyland writes that he saw a specimen at Haggerston Castle, about eight miles south of Berwick, on 29th April in that year, "and was able to observe it for some time."

HOOPOE, *Upupa epops*, Linnæus.—A casual visitant, on migration, and has frequently occurred upon both sides of the Border, both in spring and autumn, most of the occurrences being not far from the coast. The records nearest to Berwick, of which I have any note, are: Holy Island (more than once); Beal (8th November 1887—a rather unusually late date, but one, perhaps the same bird, was killed at Bamburgh about a week later); Scremerston; Grindon (September 1880); Eyemouth (May 1879, etc.); and Mr. Muirhead mentions others at Lamb's Mill, on the Whitadder (in July, about 1844); and on Lambertton Moor (September 1883). Some of these localities are only very slightly outside our Parliamentary boundary.

CUCKOO, *Cuculus canorus*, Linnæus.—Immature examples of this well-known summer visitor may be seen, with some regularity, about gardens in the town, or flying over the houses, in August and

September. Adults are much less frequent, and it is but rarely that we have the pleasure of hearing the ever welcome notes of the Cuckoo in Berwick. The late Dr. Philip Maclagan has recorded in *The Naturalist* for 1888, p. 222, that he heard one calling in a tree behind his house, about 5 A.M. on 1st May 1888, and that he had a similar experience three or four years before. I have also occasionally heard it in our garden, in Ravensdowne, in the early mornings; and in 1884, heard one calling there, in rather a subdued voice, on 6th July. Captain Norman, R.N., informs me that he both saw and heard a Cuckoo, near his garden at Cheviot House, on 30th May 1898.

I have on two or three occasions met with the interesting red phase of plumage in the adult Cuckoo, in which state the bird has sometimes been given the name of *Cuculus hepaticus*. Two instances of this occurred in 1895—one on 7th June, when I picked up the remains of a recently killed individual in Fenwick wood, in Northumberland; the other on Coldingham Moor, in Berwickshire, on 7th July.

GREAT SPOTTED CUCKOO, *Coccyzus glandarius* (Linnæus).—The specimen in the museum at Newcastle, and which was shot at Clintburn, near Bellingham, on 5th August 1870, is well known, and is the only record for the Borders, as indeed it still is for Great Britain.

STRIGES.

BARN OWL, *Strix flammea*, Linnæus.—A species once a common resident in the surrounding district, but which has for many years past been little better than a rare casual visitant. Like the Jay, and some other birds, however, it has apparently, within the last few years, been making attempts at re-establishing itself in some of its old quarters by immigration, for several have occurred in some years, in autumn, and those which were not destroyed, have been known to remain through the summer, and probably therefore bred with us. Selby ("Illustrations of British Ornithology," published in 1825) describes it as "the most common of the British species"; while in "A Report on the Ornithology of the District," read to the Berwickshire Naturalists' Club in December 1840, he alludes to it as a permanent resident, "well known and abundant." Hancock ("Birds of Northumberland and Durham") was still able to write of it, in 1874, as "a common resident species, but gradually diminishing in numbers like other birds of prey, and from the same cause."

I do not recollect of any occurrence within the Borough itself, but one of the old breeding stations of this owl, on the banks of the Whitadder, below Paxton, is only a short distance beyond our boundary: the late Mr. Evan G. Sanderson told me that he had seen a nest there in 1880.

LONG-EARED OWL, *Asio otus* (Linnæus).—This owl loves the shelter of fir woods, especially spruce, and is fairly common in the district, though I scarcely think it is so plentiful as it used to be about twenty years ago, some of its old breeding stations being now occupied by Brown Owls, apparently to the exclusion of this species. In my opinion the Long-eared Owl is one of our best natural checks upon the excessive increase of the Wood Pigeon, sharing this distinction perhaps with the Magpie. I have elsewhere remarked upon the persistent manner in which it steals the young pigeons from their nests, as food for its own offspring.

This species used frequently to be noticed in our garden, in Ravensdowne, generally in autumn, but amongst other records from my note books are the 11th December 1881, 31st July 1883, and 14th July 1887. On two occasions, in August 1888, I heard a Long-eared Owl hooting in the garden.

SHORT-EARED OWL, *Asio accipitrinus* (Pallas).—This species is also occasionally seen in the town on migration. As a rather interesting combination of species, it may be mentioned that on the afternoon of 13th October 1883, my brother disturbed a Short-eared Owl on the sea banks near the Greens Harbour, and within a short distance, also observed a Kestrel, a Merlin, a Richardson's Skua, and several Redwings. The Short-eared Owl commonly hunts for prey during daylight, and is much more like a hawk, upon the wing, than any of its kindred. A tame one in my possession was observed one afternoon to make a most determined attack upon a Grey Crow, which shared its enclosure.

TAWNY OWL, *Syrnium aluco* (Linnæus).—The most abundant of the owls in the neighbourhood, and the only one which actually nests within the Borough. I have seen it flying to its nest with a mouse carried transversely *in the bill*. It may frequently be heard hooting as loudly during the daytime as after dark, but I have never seen it persistently hunting during daylight like the last species.

TENGMALM'S OWL, *Nyctala tengmalmi* (J. F. Gmelin).—An immature female, preserved in the Berwick Museum, was captured by a fisherman, at the Greens Haven, on 4th February 1873; it was kept alive until the 8th, when it died. Length 10 inches, expanse of wings $21\frac{1}{2}$ inches. (Brotherston, "Hist. Berw. Nat. Club," vii. p. 132.) This is the same specimen which is referred to by Mr. Muirhead as obtained in February 1874. It has occurred four or five times in Northumberland.

(*To be continued.*)

ON THE OCCURRENCE OF THE ASIATIC
HOUBARA (*HOUBARA MACQUEENII*) IN
SCOTLAND.

By WM. EAGLE CLARKE, F.L.S.

SOME doubt as to the identity of the bird recorded as a Little Bustard in the last number of this magazine ("Ann. Scot. Nat. Hist.," 1899, p. 51) having arisen, Mr. Walker, the owner of the specimen, kindly submitted it to me for determination.

I found, as Mr. Walker suspected, that the bird was undoubtedly an example of the Asiatic Houbara, or Macqueen's Bustard. It is a young female, but whether about four months old or sixteen months is, perhaps, questionable, since, as in many other cases, nothing appears to be on record concerning the stages through which this species passes ere full plumage is assumed, or even the age at which it casts the plumes of adolescence to assume those of maturity. The specimen under consideration, however, has an incipient crest, a moderately developed ruff on the sides of the neck, and some show of bluish-gray on the sides of the chest.

This fine Bustard has not hitherto been recorded for Scotland. It will be remembered that the bird under notice was shot by Mr. Walker at St. Fergus, on the Pitfour estate in Aberdeenshire, on the 24th of October last.

It is the fourth British example of an Eastern species, which, as its name implies, is not even a native of Europe—its nearest haunts being in Persia, whence it spreads eastwards through the Aralo-Caspian region, Beluchistan, to Northern and Western India. It is thus a remarkable example of those erratic wanderers, not a few of which, from time to time, appear in Britain, chiefly in the autumn months.

It is worthy of note that all the specimens of this Houbara which have been known to visit our shores have been obtained in the vicinity of the East Coast, and all of

them in the month of October. The first, presumably a female from the dimensions given, was obtained in Lincolnshire in October 1847; the second, a male, in Yorkshire in October 1892; the third, a young male, also in Yorkshire, in October 1896, I had the pleasure of observing in life. Lastly, we have the Scottish female bird, which, like the one first obtained in Britain, has had the misfortune to be recorded as a Little Bustard.

In connection with the unfortunate circumstance to which allusion has just been made, it is only right to say that Mr. Sim of Aberdeen, whose name has been mentioned in connection with the identification of the specimen, writes to us to say that he never saw the bird, but that it was reported to him by the keeper, who showed him one of the feathers, and gave a general description as to size, etc.; and from this evidence, and from details Mr. Walker afforded him, Mr. Sim came to the conclusion that it would be a Little Bustard. Mr. Sim had intended to examine the specimen, but had not an opportunity of so doing.

The Asiatic Houbara has occurred in several European countries, but only as a rare and accidental visitor. There is no evidence that it is a migratory species, unless, indeed, its visits to Northern India, in the winter, from adjoining regions can be regarded as affording evidence of the migratory habit.

It is somewhat remarkable that the only other member of the genus, the African Houbara (*H. undulata*), which inhabits Northern Africa and the Canary Islands, thus occurring as near to us as Algeria, has not yet been known to visit our islands, though it occasionally crosses the Mediterranean, to appear as a wanderer in the countries of Southern Europe.

By the permission of Mr. Walker, I exhibited this interesting bird at the meeting of the Royal Physical Society of Edinburgh, on the 15th of February last.

NOTES ON SOME SCOTTISH SALMONIDÆ.

By J. A. HARVIE-BROWN, F.R.S.E., F.Z.S.

DURING the lifetime of my late lamented friend Sir James R. G. Maitland, and when Dr. Francis Day was a frequent visitor and worker at Howietoun, I used to urge a more thorough study of variations among British Salmonidæ and the publication of a lovely monographic treatise on *Trout*. Some plates were, I believe, even prepared with this end in view, but the real preliminary work required was never systematically undertaken. In order to carry out such a plan of study fully and efficiently, it would be necessary to form a syndicate or small Angling Company, who would contain amongst their active workers at least one capable artist and colourist to draw and paint in colours on the spot; a naturalist to note particulars of locality and circumstances, and preserve the choicest specimens; and the remainder, anglers who possess youth and vigour and enthusiasm, to climb to the less accessible lochs and streams for specially interesting varieties. Needless to say, each of the party ought to be both angler and naturalist.

In the well-known angling county of Sutherland, with its innumerable lochs and streams, there are many interesting varieties of Salmonidæ. All of these, however, rank, I believe with Dr. Day, only as varieties of the principal species or types recognised in that author's "History of British Fishes," and still more recently accentuated in his "British and Irish Salmonidæ." These species are:—The Salmon, *Salmo salar*, L. ("Brit. and Irish Salmonidæ," p. 51); the Sea-trout, *Salmo trutta*, L. (*op. cit.* p. 149); the Fresh-water Trout, *Salmo fario*, L. (*op. cit.* p. 182); the Char, *Salmo alpinus*, L. (*op. cit.* p. 112); and all other so-called species must, I consider, have their names sunk to the value of mere varieties—such as the Great Lake Trout, *Salmo ferox*, and many others. I am not speaking, of course, of aberrant forms of the Salmonidæ, such as the Sperlting (*Osmerus eperlanus*).

I have in the following notes mainly to do with certain varieties of the Salmonidæ belonging to the above species which are found in different lakes and rivers in Scotland

which I have myself angled in, or am otherwise acquainted with.

LOCH MAIDAIDH AND SMOO BURN-TROUT.

Beginning in the north of Scotland, I would first speak of certain lochs around Durness which I visited in 1882. Six years previous to that date, one Mr. Neil Campbell caught at Smoo five or six trout in the short reach of burn which flows from the Smoo cave to the sea, and put them into the Alt Smoo above the cave. Until this time there were no trout above the fall, which plunges through the opening in the roof of the cave and falls some forty feet into the dark pool below. The whole stretch of water occupied by trout before this introduction was effected were the waters of the inner and outer cave, and a distance of about 30 yards between the cave and the sea, and even less at the time of spring tides. I endeavoured to obtain specimens of the trout where Mr. Neil Campbell had obtained them, but did not succeed in getting one, though I was most anxious to do so.

Since the introduction, the crofters of the neighbourhood—when cutting or carting peats, or driving their cattle on the Commonly which surrounds Loch Maidaith, and which communicates with Alt Smoo by a deep ditch-like and winding stream through boggy land, with, however, firm banks, and runs with the clearer water of Alt Smoo until the whole plunges down the hole in the roof of the cave—have occasionally seen a few trout rising, but no one at the time of my visit had ever thrown a fly upon the loch or burn. On the 16th June 1882 I crossed over the stony, barren-looking moor, where the crofters' cattle pick up a scanty summer's grass between the hummocks of peat resting on stony sub-soil. I crossed, also, the now dry bed of another loch which had been drained some time ago. Arriving at Loch Maidaith, I fished from the crofters' sheep-washing piers; but the result was only one beautifully formed $\frac{1}{2}$ lb. trout, with a marvellous line of scarlet, or rather crimson, spots on the sides, and somewhat silvery scales. Loch Maidaith is peaty and dark. I then moved on to the burn, which runs dark and deep between deeply caved and undermined banks, and here and there spreading out over the marshy meadows or peaty flats.

Here the fun became fast and furious, with scarcely even a ripple on the surface. I soon had one $\frac{3}{4}$ lb. and several close on $\frac{1}{2}$ lb. In all, twenty-nine trout, weighing $7\frac{3}{4}$ lbs. Of this dead water there are only about 100 yards. I lost two or three fine trout quite as large as the biggest I got. These, I am assured on all hands, are the first trout killed here by rod and line—or by any method—since the introduction by Mr. Neil Campbell about 1876.

Now, as I have said, below the cave there is not more than 30 yards of shallow stream, and one pool outside the entrance of the cave, and the deep pools inside in which boys catch small trout with worms. Pocaan Smoo is a narrow göe which may at one time have been roofed over with limestone.

The remarkable facts about these trout are as follows:—The bright, large, irregularly shaped blotches of crimson, shining like sealing-wax, ran in a straight line along the lateral line on either side of the fish, and in many places became confluent, making an almost continuous crimson streak with irregular edges almost entirely covering up the dark lateral line. I was told that the small trout in the cave pools were dark and “very ordinary looking fish.”

That no trout existed above the fall before the introduction is not very extraordinary or unusual. I know many other places where such is the case; as, for instance, in the Alt Maldie near Kylesku, and the great Loch Lead Vuan (where the late Mr. Gould the ornithologist introduced trout), and others I shall still have to speak of. Now natives usually account for the absence of trout above a fall by simply saying, “Yes sir, they can’t get above the fall.” But in the case of this Alt Smoo below the fall, the question arises, How did the trout get there *unless they had their first origin in the sea*, or has the land sunk, and a larger portion of the river been submerged by the sea? But see again under Parr-marked Trout, *infra*, p. 81.

One other point is raised by the extraordinary brightness, size, and confluence of the spots along the lateral line. Has this extraordinarily bright superabundance of colour been produced by a sudden release from the dark imprisonment of the cave pools and translation to the sparkling

limestone bed of the Alt Smoo above, and free access to nearly 3 more miles of water? I think so, and in further notes I have to offer I think I can prove that this coloration in fishes is dependent upon light to a very large extent; dependent also upon the colour of the water and bottom, in and on which they feed; though we believe there are other causes besides, which appear to be more obscure to our senses at present.

When I come to consider some of the other lakes and streams, the object of dwelling upon these peculiarities of the Alt Smoo trout may become more apparent.

CRASSPUIL TROUT.

I will now speak of another loch in the Durness district—viz. Loch Crasspuil. This loch contains most lovely trout, perhaps more closely allied to Loch Leven trout both as regards appearance and in the number of the cæcal appendages, as well as in the flavour of their flesh. The natives look upon them, indeed, as a cross between sea-trout and burn-trout, having silvery scales and growing to a large size. This loch is united to the sea by a shallow stream, and there is every reason to believe that these trout were at one time migratory, but are now confined; the most of the burn water being diverted, and a sluice put on to supply and regulate water to a mill-wheel at Balnakeil.

On the 13th June 1882, having obtained the minister's coble, my man and I endeavoured to obtain samples of these fish. At first they rose very freely, but I was disappointed with the size, none which were caught being up to the $\frac{1}{2}$ lb., and the lot perhaps averaging $\frac{1}{4}$ lb. They were wonderfully silvery: belly shiny white, covered with minute silvery scales; back very clear green; and sides spotted with small dark spots, all being covered with the lovely clear scales. The silvery colour is easily accounted for. The water of the loch is clear and bright green, or dark green, according to the depth, over a bottom of pure white or light yellow sand. The green of the trout's back follows the green of the water, the silvery white the colour of the bottom. The spawning-ground is good, not wide, but nearly a mile long, and runs

through marshy meadows like a ditch. I sent half a dozen of these little fishes to Dr. Day, and he reported upon them some little time afterwards. He named them Variety Crasspuil Trout (*v.* Day's "British Fishes," vol. ii. p. 100), and he endeavoured to figure one in his "British Salmonidæ," but not, I think, doing justice to the beauty and mother-of-pearl-like brilliancy of the under part, nor the vivid green of the back. Of course, the ones we sent must have "gone off colour" very appreciably when travelling between Durness and Cheltenham.

Close to Loch Crasspuil is Loch Borralaidh, which is likewise a sandy loch with bright green weeds. Like the Alt Smoo, the waters of this loch dive under ground in the limestone and gush up again on the margin at the head of Loch Crasspuil. In this loch there are no trout, but many char, which, we were assured, grow to about 1 and $1\frac{1}{2}$ lbs. in weight.

Of many varieties of what are known as tidal trout which I have met with in many localities in Sutherland and in the Hebrides and elsewhere, I found those at the mouth of the Dionard river near Durness were recognised by the natives and called "Brown Sea Trout." These are, however, simply river trout which have, as in all other places, I believe, become acclimatised to the sea pools or brackish water, and have taken on to some extent the silvery appearance of sea-trout. But the silveriness of those I obtained was nothing compared to that of the Crasspuil trout, which have long since failed to reach the sea. The vomer of these was toothed, having a double row of about 12 to 14 teeth. These tidal trout of the Dionard reach weights varying from $\frac{1}{2}$ lb. to $1\frac{1}{2}$ lb. I got nothing over $\frac{3}{4}$ lb. I shall have more to say about tidal trout again.

LOCH SEAN TROUT.

Near the entrance of Loch Erribol, on the north coast of Sutherland, is a loch called Loch Sean, which I visited on the 18th of June 1882. It is separated from the sea only by a ridge of gravel and loose stones, through which the tides work, and the loch is therefore brackish. At high

spring tides the sea pours in over the top of the said ridge. Loch Sean contains a modified form of sea-tangle, dwarfed and dark coloured. The loch is very shallow on its west side, very deep on the east side, and is not reckoned a good fishing loch. It is fed by several small spawning streams. It holds sea-trout of good size, but many small ones: also brown trout, of which I was credibly informed by Mr. Donald Mackay. It is believed also by Mr. Mackay to hold specimens of *S. ferox* (so called), but I had no chance of verifying this statement. I caught only a few brown trout—dark coloured, with a slight golden lustre and distinct spots.

TIDAL TROUT.

The tidal trout of the rivers Inver and Kirkaig are known to the natives as “fossacks.” They ascend the Inver only as far as the first tidal pool, or Bridge Pool, but go up the Kirkaig as far as the Bridge Pool of that river, or about two pools above the tide—a distance of 150 yards above the highest spring tide. This they do in the summer months, but entirely disappear from these tidal pools in winter, and after August; and it is believed by the natives that they fall back and spawn in deeper tidal waters. However, my own idea, from the appearance of these fish, which grow up to 2 lbs. and 5 lbs. weight, and are very lusty and powerful, is that it is more likely that they are barren fish, spawning neither in fresh nor tidal water. They never are known to rise to an artificial fly, and can only be caught with a worm or a small “angel” or other bright spinning bait. They are most abundant in these pools in May. They are never caught in the brackish water, but only in the perfectly fresh water when the tide is out of the pools; but many move up and down with each tide. Dr. Day, who examined specimens I sent him, said they were simply river trout living in brackish water. Their flesh is white and tasteless, the colour slimy dark green and few or no spots, and coarse scales. Head small, body very short and thick, and they are very powerful and when hooked give good sport.¹

¹ From the whiteness of the flesh, and insipid flavour and softness, it might almost seem, though strong and fighting vigorously for life if hooked, that they are out of season and condition in May, June, and July.

The next trout I desire to speak about are the Parr-marked Trout of the Goberneasgach Deer Forest and the Hump-backed Trout of the same district.

PARR-MARKED TROUT.

On a fine warm night in July I camped out by the side of Loch na Sgeirach, or "The Loch of the Parr-marked Trout." I was accompanied by two ghillies—John M'Innes and James Mackay. We had left the Shooting Lodge of Goberneasgach and followed the bridle-path up Glen Golly (Ghollie?)—a distance of 4 miles and 80 yards. My object was simply to obtain specimens of these Parr-marked Trout, which I had heard of, but never seen. That same evening we fished in the long summer "gloaming," and got 23 trout (9 lbs.). Next morning we tried again, but added nothing to our creel. We then "bundled up our plaidie" and ground-sheet, and the party walked across the moor—Mheal an Lochan Sgeirach—to Loch na Shallag ("The Loch of the Hunting"), about $1\frac{1}{2}$ mile, which loch is reputed to hold trout running up to 2 and 3 lbs. It lies at the base of Sabhal Mör, at an elevation of 1598 feet, and is of considerable extent; and it, along with Loch na Sgeirach and Loch an Fheoir nam Sabhal (of which more anon), drain into the Hope River *via* Glen Ghollie. The high waterfall in Glen Ghollie—Coin-ras—must have prevented any *up-stream* migration of fish to any of these lochs. There appears to be nothing peculiar in the trout of Loch na Shallag, except their fine growth and quality. Those, however, which we caught were either not yet in perfect condition, or had gone off a little. They gave great sport, rising and behaving like grilse when hooked. The loch does not appear to be very deep, but goes down precipitously, and then seems to maintain about 12 feet in depth for a considerable distance from the shore; the bottom apparently being of mud and sand with many star-shaped green plants and other vegetation. We caught 14 trout (10 lbs.) during perhaps two hours we remained at this loch. Curiously, they rose very tardily until the mist came down, and then they rose much better in the bays, and in the narrows near an island (which is *not* marked in the Ordnance one-inch map).

About 9 A.M. we stopped, and went on to Lochan Fheoir am Sabhal,—or “The Loch of the Hog-backed Trout,”—about one mile to the south-east of Loch na Shallag. Here we could do almost nothing. One hooked by Mackay fought desperately and got off, but Mackay killed a small one with a young frog. We could not find any more young frogs. It became cold, with mist and rain, and the whole landscape was blotted out. We “gave in,” and walked over the ridge and down the steep hillside to the Lodge, which we reached about 1.30 P.M.

After a cup of tea and a pipe, I turned in and had five hours' good sleep.

The Parr-marked Trout are handsome, high- but not hump-backed. When taken out of the water, all the parr-markings are very distinct, even vivid ; but these gradually fade and almost or quite disappear after death, *i.e.* if exposed to light and air, as the ones we caught were, none having been, unfortunately, promptly preserved, as should have been done. These parr-marks fade up to a certain stage and then seem to remain, and can be found by careful examination in favourable lights. These trout are red-spotted—two rows, one along the median line, the other below the same—and slightly irregular or zig-zagged. Between Loch na Sgeirach and the Hope River, where salmon ascend as far as Gobenasgach Lodge, there is a fall of 60 feet, barring all farther progress upward from the sea.

HUMP-BACKED TROUT.

The hump-backed trout of Fheoir Lochan are, I was told abundant in the small, deep, clear spring pool, and grow to a good size. The hump on the one specimen we obtained is very pronounced ; the fish is of vigorous build and very handsome.

Fheoir Lochan—or Lochan Fheoir nam Sabhal—is situated at the base of Sabhal-bheag, and is surrounded on three sides by the shoulders and scarps of that mountain. Lochan Fheoir is an oval or nearly circular tarn or pool—perhaps half an acre in extent, or about 80 yards by 60 (?). It is said to be *very deep*. The waters are marvellously clear and

limpid, and the water deepens steeply and abruptly from the shore, like the arms of a letter Y. It is fed from the hill by a small, trickling, steep-flowing burn, which then glides slow for 160 yards; and an equally, or nearly as, steep, rugged stream flows from it directly, losing itself amongst large rough stones and boulders. The lochan lies in the aforesaid hollow, amongst rather flat land on the one side, through which the feeding streamlet runs. A fringe of water-sedges encircle two parts of the edges, and the rest of the shore is stony and rocky. After about 10 feet of lip or shallow margin, the deep water comes rapidly. Though the water is very clear, the bottom was invisible; but the trout, when they came to the small frog, could be seen many feet below the surface. I glaciated the one specimen we obtained and sent it to the late Dr. Francis Day, whilst he was engaged in writing his valuable treatise upon our British Salmonidæ.

I am not going to theorise upon the causes or origin of these peculiar varieties, being content to state the facts, and the local circumstances and surroundings. But I think I have said enough to point out that there is still much to learn about our British Salmonidæ which has never yet been systematically undertaken. Of the hundreds of anglers who penetrate into the farthest recesses of our Highland glens and wilder forests, how many are there who devote a single pencil-mark in their diaries to, or dream of accounting for the natural phenomena which—one would fancy—even the least observant could scarcely avoid seeing? How many are there who even *imagine* causes for the phenomena which meet them at almost every turn? No doubt, the difficulties which appear in the course of the study of the Salmonidæ in an old country like ours are *great*, if not insurmountable. But if such a study be considered in conjunction with parallel studies, or chances of observation, offered to the naturalists of a new country like New Zealand or Australia, or to those who are conducting the introduction of Salmonidæ in South African colonies,—if our anglers, that is to say, would keep notes, and not consider the main object in fishing *merely to kill fish*,—then surely some useful and valuable scientific results might ensue in course of time. Many hints have been thrown out by such men as Willis

Bund, Major Traherne, Dr. Francis Day, and some of our Fisheries Commissioners ; but it seems to me few later writers have built upon these bases, except in so far as trout and hybrid Salmonoids have been observed under more or less artificial conditions.

I must leave over for the present an account of stocking certain previously fishless streams and lochs, and their subsequent history.

DIPTERA SCOTICA : I.—PERTSHIRE.

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

WITH a view to furthering our knowledge of the distribution of Diptera in Scotland, I propose to publish from time to time, according to the opportunities which present themselves, county lists extracted from the notes which have for some years been accumulating in my register of specimens. I shall also supplement these lists by references to records published elsewhere, and by adopting this method I hope in time to be able to furnish a complete account of our knowledge of the subject. For my purpose I have considered it better to adopt political divisions rather than the more natural areas founded upon river drainage, though I shall probably by this plan lay myself open to the criticism of many lovers of "faunal areas." With animals possessing such perfect locomotive powers as we find in insects it seems to me to matter little what basis of division is adopted, as the natural boundaries in a small area like Britain can only offer the very slightest impediment to the spread of species. At any rate, a more precise idea of distribution can be gained by the adoption of county boundaries than by taking the much larger areas defined by nature.

In publishing these records, considering the very deficient nature of our knowledge of the distribution and times of appearance of Diptera, I have thought it better to give full details of localities and dates of all species, even the commonest, as it is only by this means that we can gain a really *accurate* idea of such subjects. I shall number the species consecutively and separately for each county, and in

the supplementary lists which I hope to furnish later on, all additions to the county will receive numbers consecutive with those already published, so that at any time the number of recorded species for any particular county can be ascertained at a glance. New localities for the rarer or more interesting species will be given, but the *old* number, for convenience of reference, will in each case be affixed to the specific name.

The following contribution, forming the first of the series, is the result of the collecting zeal of three of my valued correspondents, namely, Mr. W. Wylie of Perth, Mr. T. M. M'Gregor of the same city, and my esteemed friend Mr. William Evans. To Mr. Alex. M. Rodger, of the Perth Museum, I am indebted for allowing me to work through Mr. Wylie's specimens. While tendering my thanks to these gentlemen for their valuable assistance, may I express the hope that their kindly example may be followed by others in different parts of Scotland, so that I may be able to proceed in like manner to the preparation of lists for other counties?

Mr. M'Gregor's records have been previously published by me in the "Annals" (1895, pp. 159-162), but in order to render the present paper more complete, and to save troublesome back reference, I have incorporated them in the following list.

Family MYCETOPHILIDÆ.

1. MYCETOPHILA SIGNATA, *Mg.*—Kinfauns and Kinnoull, June 1897 (Wylie).
2. GLAPHYROPTERA FASCIPENNIS, *Mg.*—Woody Island, June 1894 (M'Gregor).
3. BOLITOPHILA CINEREA, *Mg.*—Kinnoull, June 1897 (Wylie).

Family BIBIONIDÆ.

4. SCATOPSE NOTATA, *Linn.*—Almond Valley, April 1894 (M'Gregor).
5. DILOPHUS FEBRILIS, *Linn.*—Kinfauns Woods, 1896 (Wylie); Fenderbridge, near Blair-Atholl, September 1898 (Evans).
6. BIBIO POMONÆ, *Fab.*—Methven Moss, August 1894 (M'Gregor); Kinfauns Woods, 1896 (Wylie); Falls of Bruar, 10th September 1898 (Evans); Fenderbridge, near Blair-Atholl, September 1898 (Evans).

7. BIBIO MARCI, *Linn.*—Almond Valley, May 1894 (M'Gregor).
8. BIBIO LEUCOPTERUS, *Mg.*—Almond Valley, May 1894 (M'Gregor).
9. BIBIO VENOSUS, *Mg.*—Almond Valley, May 1894 (M'Gregor).
10. BIBIO NIGRIVENTRIS, *Hal.*—Almond Valley and Woody Island, May 1894 (M'Gregor).
11. BIBIO LANIGER, *Mg.*—Methven Moss and Minkie Moss, April 1894 (M'Gregor); Aberfoyle, April 1896 (Evans).
12. BIBIO JOHANNIS, *Linn.*—Almond Valley, May 1894 (M'Gregor).
13. BIBIO CLAVIPES, *Mg.*—Kinfauns Woods, 22nd August 1896 (Wylie); Fenderbridge, September 1898 (Evans).

Family SIMULIDÆ.

14. SIMULIUM REPTANS, *Linn.*—Almond Valley, Woody Island, and Dalguise, May 1894 (M'Gregor).

Family CULICIDÆ.

15. CULEX NEMOROSUS, *Mg.*—Minkie Moss, April 1894 (M'Gregor).
16. CULEX ANNULATUS, *Schrk.*—Fenderbridge, September 1898 (Evans).

Family PTYCHOPTERIDÆ.

17. PTYCHOPTERA ALBIMANA, *Fab.*—Perthshire, 1897 (Wylie).

Family LIMNOBIDÆ.

18. LIMNOBIA NUBECULOSA, *Mg.*—Fenderbridge, September 1898 (Evans).
19. LIMNOBIA FLAVIPES, *Fab.*—Perthshire, 1897 (Wylie).
20. DICRANOMYIA CHOREA, *Mg.*—Perthshire, 1897 (Wylie).
21. TRICHOCERA HIEMALIS, *Deg.*—Perthshire, 1897 (Wylie).
22. AMALOPIS IMMACULATA, *Mg.*—Almond Valley, May 1894 (M'Gregor).

Family TIPULIDÆ.

23. PACHYRRHINA HISTRIO, *Fab.*—Perthshire, 1897 (Wylie).
24. TIPULA VARIPENNIS, *Mg.*—Perthshire, 1897 (Wylie).
25. TIPULA OCHRACEA, *Mg.*—Perthshire, 1897 (Wylie).

Family RHYPHIDÆ.

26. RHYPHUS FENESTRALIS, *Scop.*—Kinnoull, 1896 (Wylie); Fenderbridge, September 1898 (Evans).
27. RHYPHUS PUNCTATUS, *Fab.*—Kinfauns Woods, 1896 (Wylie); Kinnoull, June 1897 (Wylie).

Family STRATIOMYIDÆ.

28. SARGUS FLAVIPES, *Mg.*—Kinnoull, June 1897 (Wylie).
 29. SARGUS NUBECULOSUS, *Ztt.*—Perth Nurseries, 25th July 1896 (Wylie).
 30. SARGUS INFUSCATUS, *Mg.*—Perth Nurseries, 1896 (Wylie).
 31. MICROCHRYSA POLITA, *Linn.*—Perth Nurseries, 25th July 1896 (Wylie); Kinnoull, July 1897 (Wylie).
 32. MICROCHRYSA FLAVICORNIS, *Mg.*—Perth Nurseries, 1896 (Wylie).
 33. BERIS CHALYBEATA, *Forst.*—Kinnoull, July 1897 (Wylie).

Family TABANIDÆ.

34. HÆMATOPOTA PLUVIALIS, *Linn.*—Kinfauns Woods, 1896 (Wylie).
 35. CHRYSOPS CÆCUTIENS, *Linn.*—Scone, 5th July 1898 (Wylie).
 36. CHRYSOPS RELICTUS, *Mg.*—Perthshire, 1894 (M'Gregor).

Family LEPTIDÆ.

37. LEPTIS SCOLOPACEA, *Linn.*—Methven Moss and Kinnoull Hill, 1894 (M'Gregor); Kinfauns, July 1897 (Wylie).
 38. LEPTIS TRINGARIA, *Linn.*—Methven Moss, August 1894 (M'Gregor); Kinfauns Woods, August 1896 (Wylie).
 39. LEPTIS LINEOLA, *Fab.*—Kinnoull, July 1896 (Wylie).
 40. LEPTIS CONSPICUA, *Mg.*—A male taken by Mr. Evans at Fenderbridge in September 1898 agrees well with Schiner's description of this species ("Fauna Austriaca," i. p. 175). In Verrall's "List" (1888) it was placed among the *reputed* British species.
 41. ATHERIX IBIS, *Fab.*—Woody Island, June 1894 (M'Gregor).

Family BOMBYLIDÆ.

42. BOMBYLIUS CANESCENS, *Mik.*—Near Perth, June 1894 (M'Gregor).

Family THEREVIDÆ.

43. THEREVA NOBILITATA, *Fab.*—Stanley, June 1894 (M'Gregor); Kinfauns, July 1897 (Wylie).

Family EMPIDÆ.

44. CYRTOMA SPURIA, *Fln.*—Fenderbridge, September 1898 (Evans).
 45. RHAMPHOMYIA SULCATA, *Fln.*—Dalguise, May 1894 (M'Gregor); Kinfauns, June 1897 (Wylie).

46. RHAMPHOMYIA SPINIPES, *Flu.*—Kinfauns Woods, 27th August 1896 (Wylie); Aberfoyle, 11th September 1897 (Evans); Falls of Bruar, 10th September 1898 (Evans); Fenderbridge, September 1898 (Evans).
47. EMPIS TESSELLATA, *Fab.*—Almond Valley, May 1894 (M'Gregor); near Perth, June 1894 (M'Gregor); Bankfoot, July 1894 (M'Gregor); Kinnoull Hill, July 1897 (Wylie).
48. EMPIS LIVIDA, *Linn.*—Almond Valley, August 1894 (M'Gregor); Kinnoull Hill, 9th July 1898 (Wylie).
49. EMPIS BOREALIS, *Linn.*—Dalguise, May 1894 (M'Gregor); Aberfoyle, April 1896 (Evans).
50. EMPIS STERCOREA, *Linn.*—Kinnoull Hill, June and July 1897 (Wylie).
51. EMPIS CHIOPTERA, *Flu.*—Almond Valley, May 1894 (M'Gregor).
52. HILARA PINETORUM, *Ztt.*—Almond Valley, May 1894 (M'Gregor); near Perth, June 1894 (M'Gregor).
53. HILARA NIGRINA, *Flu.*—Woody Island, May 1894 (M'Gregor).
54. HEMERODROMIA PRECATORIA, *Flu.*—Kinfauns and Kinnoull, June 1897 (Wylie).
55. TACHYDROMIA LUTEA, *Flu.*—Kinfauns and Kinnoull, June 1897 (Wylie).

Family DOLICHOPODIDÆ.

56. PSILOPUS PLATYPTERUS, *Fab.*—Scone, July 1897 (Wylie); Kinnoull Hill, July 1898 (Wylie).
57. DOLICHOPUS ATRIPES, *Mg.*—Fenderbridge, September 1898 (Evans).
58. DOLICHOPUS PLUMIPES, *Scop.*—Scone, July 1897 (Wylie).
59. DOLICHOPUS ÆNEUS, *Deg.*—Kinnoull, June 1897 (Wylie).
60. PORPHYROPS CRASSIPES, *Mg.*—Almond Valley, May 1894 (M'Gregor).

Family LONCHOPTERIDÆ.

61. LONCHOPTERA LACUSTRIS, *Mg.*—Minkie Moss, April 1894 (M'Gregor).

Family PLATYPEZIDÆ.

62. OPETIA NIGRA, *Mg.*—Almond Valley, May 1894 (M'Gregor).

Family SYRPHIDÆ.

63. PIPIZELLA VIRENS, *Fab.*—Woody Island, June 1894 (M'Gregor).
64. PIPIZA NOCTILUCA, *Linn.*—Perthshire, 1894 (M'Gregor).
65. PIPIZA QUADRIMACULATA, *Panz.*—Kinnoull, June 1897 (Wylie).

66. ORTHONEURA NOBILIS, *Flu.*—Kinnoull, 1896 (Wylie).
67. CHILOSIA ANTIQUA, *Mg.*—Kinnoull, 25th July 1896 (Wylie).
68. CHILOSIA PRÆCOX, *Ztt.*—Kinnoull, 1st August 1896 (Wylie).
69. CHILOSIA CESTRACEA, *Linn.*—Kinnoull, 11th July 1896 (Wylie).
70. LEUCOZONA LUCORUM, *Linn.*—Glenfarg, May 1894 (M'Gregor); Kinnoull Hill, July 1897 (Wylie).
71. MELANOSTOMA QUADRIMACULATUM, *Verrall.*—Kinnoull Hill, 1897 and 9th July 1898 (Wylie).
72. MELANOSTOMA MELLINUM, *Linn.*—Almond Valley and Woody Island, May 1894 (M'Gregor); Methven Moss, June 1894 (M'Gregor); Kinnoull, 1896 (Wylie); Fenderbridge, September 1898 (Evans).
73. PYROPHÆNA OCYMI, *Fab.*—Kinfauns Woods, 1st August 1896 (Wylie).
74. PLATYCHIRUS MANICATUS, *Mg.*—Woody Island, May and June 1894 (M'Gregor); Kinnoull Hill and near Perth, June 1894 (M'Gregor); Kinnoull, 8th August 1896 (Wylie); Fenderbridge, September 1898 (Evans).
75. PLATYCHIRUS ALBIMANUS, *Fab.*—Almond Valley, April, May, and August 1894 (M'Gregor); Woody Island, May and June 1894 (M'Gregor); Fenderbridge, September 1898 (Evans).
76. PLATYCHIRUS ANGUSTATUS, *Ztt.*—Perth Nurseries, 25th July 1896 (Wylie).
77. DIDEA ALNETI, *Flu.*—Almondbank, September 1897 (Wylie).
78. SYRPHUS BARBIFRONS, *Flu.*—Kinfauns, June 1897 (Wylie).
79. SYRPHUS LASIOPHTHALMUS, *Ztt.*—Almond Valley, Methven Moss, and Minkie Moss, April 1894 (M'Gregor); Dalguise, May 1894 (M'Gregor); Kinfauns, June 1897 (Wylie).
80. SYRPHUS UMBELLATARUM, *Fab.*—Fenderbridge, September 1898 (Evans).
81. SYRPHUS CINCTELLUS, *Ztt.*—Kinnoull, 1896 (Wylie); Fenderbridge, September 1898 (Evans).
82. SYRPHUS CINCTUS, *Flu.*—Kinnoull, 1896 (Wylie).
83. SYRPHUS BALTEATUS, *Deg.*—Kinfauns Woods, 1st August 1896 (Wylie).
84. SYRPHUS LUNIGER, *Mg.*—Kinfauns Woods, 1896 (Wylie); Kinnoull Hill, August 1898 (Wylie).
85. SYRPHUS COROLLÆ, *Fab.*—Perthshire, 1894 (M'Gregor).
86. SYRPHUS RIBESII, *Linn.*—Kinnoull Hill, June 1894 (M'Gregor); Kinfauns Woods, 8th August 1896 (Wylie); Fenderbridge, September 1898 (Evans).
87. SYRPHUS TRICINCTUS, *Flu.*—Kinnoull, 18th July 1896 (Wylie).

88. SYRPHUS ANNULIPES, *Ztt.*—Kinfauns woods, July 1896 (Wylie).
This record was published by me in the "Annals" for 1897 (p. 21), where I erroneously stated that the species was new to Britain. As Mr. Verrall has since kindly pointed out to me, I had overlooked some records published in the "Entomologist" for 1894, the localities where it had been previously obtained being Selsley (in the Cotswolds), Lynton (North Devon), and Nevin (North Wales).
Half a dozen females were obtained in Perthshire by Mr. Wylie in 1897.
89. SYRPHUS LUNULATUS, *Mg.*—Kinfauns, June 1897 (Wylie).
90. SYRPHUS ALBOSTRIATUS, *Fln.*—Bankfoot, July 1894 (M'Gregor).
91. SYRPHUS GLAUCIUS, *Linn.*—Kinfauns, 10th July 1898 (Wylie).
92. CATABOMBA PYRASTRIS, *Linn.*—Stanley, August 1894 (M'Gregor); Kinfauns Woods, 5th September 1896 (Wylie); Kinnoull Hill, 6th August 1898 (Wylie).
93. SPHÆROPHORIA PICTA, *Mg.*—Kinnoull, June 1897 (Wylie).
94. SPHÆROPHORIA NITIDICOLLIS, *Ztt.*—Kinnoull, June 1897 (Wylie).
95. SPHEGINA CLUNIPES, *Fln.*—Fenderbridge, September 1898 (Evans).
96. ASCIA PODAGRICA, *Fab.*—Perthshire, 1894 (M'Gregor).
97. RHINGIA ROSTRATA, *Linn.*—Glenfarg, May 1894 (M'Gregor); Springfield Hill, May 1897 (Wylie).
98. VOLUCELLA BOMBYLANS, *Linn.*—Methven Moss, August 1894 (M'Gregor); Methven Moss, 3rd July 1898 (Wylie).
99. VOLUCELLA PELLUCENS, *Linn.*—Bankfoot, July 1894 (M'Gregor); Almond Valley, August 1894 (M'Gregor); Methven Moss, 11th July 1896 (Wylie); Fenderbridge, September 1898 (Evans).
100. SERICOMYIA BOREALIS, *Fln.*—Methven Moss, 11th July 1896 (Wylie); Kinnoull, July 1897 (Wylie); Fenderbridge, September 1898 (Evans).
101. SERICOMYIA LAPPONA, *Linn.*—Glenfarg, May 1894 (M'Gregor); Kinfauns, 19th April 1898 (Wylie).
102. ARCTOPHILA MUSSITANS, *Fab.*—Kinnoull Hill, 10th September 1898 (Wylie).
103. ERISTALIS TENAX, *Linn.*—Almond Valley, April, July, and August 1894 (M'Gregor); Bankfoot, July 1894 (M'Gregor); Stanley, August 1894 (M'Gregor); Kinfauns Woods, 29th August 1896 (Wylie); Fenderbridge, September 1898 (Evans).
104. ERISTALIS INTRICARIUS, *Linn.*—Almond Valley and Methven Moss, April 1894 (M'Gregor).

105. *ERISTALIS ARBUSTORUM*, *Linn.*—Almond Valley, April and August 1894 (M'Gregor); near Perth, June 1894 (M'Gregor); Stanley, August 1894 (M'Gregor); Fenderbridge, September 1898 (Evans).
106. *ERISTALIS RUPIUM*, *Fab.*—Stanley, August 1894 (M'Gregor); Kinfauns Woods, 1896 (Wylie); Fenderbridge, September 1898 (Evans).
107. *ERISTALIS PERTINAX*, *Scop.*—Minkie Moss, April 1894 (M'Gregor); Methven Moss and Stanley, August 1894 (M'Gregor).
108. *ERISTALIS NEMORUM*, *Linn.*—Stanley, August 1894 (M'Gregor).
109. *ERISTALIS HORTICOLA*, *Deg.*—Kinfauns Woods, 25th July 1896 (Wylie); Kinnoull, June 1897 (Wylie).
110. *MYIATROPA FLOREA*, *Linn.*—Stanley, August 1894 (M'Gregor).
111. *HELOPHILUS HYBRIDUS*, *Lw.*—Almond Valley, August 1894 (M'Gregor).
112. *HELOPHILUS PENDULUS*, *Linn.*—Almond Valley, July 1894 (M'Gregor); Methven Moss, 29th August 1896 (Wylie).
113. *HELOPHILUS LINEATUS*, *Fab.*—Almond Valley, July and August 1894 (M'Gregor).
114. *MERODON EQUESTRIS*, *Fab.*—A female taken on Juniper in Kinnoull Nursery, July 1897 (Wylie). This is, I believe, only the second Scottish record of this rare species. Presumably it was introduced (as is usually the case) into the nursery as a larva within a *Narcissus* bulb.
115. *XYLOTA SEGNIS*, *Linn.*—Almond Valley, August 1894 (M'Gregor); Perthshire, 1898 (Wylie).
116. *XYLOTA SYLVARUM*, *Linn.*—Kinnoull, July 1897 (Wylie).
117. *SYRITTA PIPIENS*, *Linn.*—Woody Island, June 1894 (M'Gregor); Stanley, August 1894 (M'Gregor); Kinnoull, 18th July 1896 (Wylie).
118. *CHRYSOTOXUM ARCUATUM*, *Linn.*—Kinfauns Woods, 18th July 1896 (Wylie).
119. *CHRYSOTOXUM BICINCTUM*, *Linn.*—Kinnoull, 1896 (Wylie).

Family CONOPIDÆ.

120. *CONOPS QUADRIFASCIATUS*, *Deg.*—Kinnoull, 1896 (Wylie); Falls of Bruar, 10th September 1898 (Evans).
121. *SICUS FERRUGINEUS*, *Linn.*—Methven Moss, August 1894 (M'Gregor).
122. *MYOPA BUCCATA*, *Linn.*—Springfield Hill, May 1897 (Wylie).
123. *MYOPA FASCIATA*, *Mg.*—Stanley, June 1894 (M'Gregor).

(To be continued.)

RECORDS OF SCOTTISH PLANTS FOR 1898,
 ADDITIONAL TO WATSON'S "TOPO-
 GRAPHICAL BOTANY," 2nd Ed. (1883).

By ARTHUR BENNETT, F.L.S.

THESE Records are made thus early, because many of those of Cos. 107 and 108 were unfortunately omitted last year; and I take the earliest opportunity to set this right.

In the last year's "Records" I mentioned that in this year's an opportunity would be taken to correct some errors that had crept in; but it now seems better to leave them until Dr. Trail's "Scottish Topographical Botany" is completed, when the whole can be collated, and any necessary corrections or excisions can be made.

The abbreviations, etc., are the same as in former records, viz. "Ann. S. N. H." = "Annals of Scottish Natural History"; "J. B." = "Journal of Botany"; *sp.* denotes that a specimen was sent me, and ! denotes that I have seen a specimen labelled as from the county.

74. WIGTOWN.

Ranunculus auricomus }
 Cichorium Intybus } *Gorrie (ex M'Andrew).*
 Mentha sylvestris, *J. M'Andrew, sp.*

84. LINLITHGOW.

(*Messrs. Somerville and Renwick.*)

Hypericum dubium, *sp.* *Atriplex erecta, sp.*
 Leontodon autumnalis, *sp.* *Polygonum Bistorta, sp.*
 Veronica agrestis, *sp.*

95. ELGIN.

Epilobium obscurum }
 Hieracium angustatum, Lindeb. } *E. S. Marshall.*

96. EASTERNESS.

Potamogeton obtusifolius, *E. S. Marshall.*

97. WESTERNESS.

Rubus Boræanus, Genev., *S. M. Macvicar.* Determined by Rev.
 Moyle Rogers "new to Scotland."
 †Sambucus Ebulus }
 †Galium Mollugo } *Macvicar!*

98. MAIN ARGYLE.

- Helianthemum vulgare, *sp.*, *S. M. Macvicar*. Recorded for 97,
 "Isle of Lismore," in error.
 Polygala eu-vulgaris, *Macvicar!*
 Rubus rhamnifolius, *f.*, *C. E. Salmon*.
 Sparganium neglectum, *sp.* Potamogeton coloratus, *sp.*
 „ minimum, *pers. auth.* Carex vulpina, *sp.*
 Potamogeton prælongus, *sp.* Avena pubescens, *sp.*
 „ perfoliatus, *sp.*

100. CLYDE ISLES.

- Bartsia viscosa, *Ballantyne (ex Somerville), sp.*

101. CANTIRE.

- Bartsia viscosa }
 Carex lævigata } *Miss Geldart!*

(*J. M^r Rae, ex Somerville.*)

- | | |
|-----------------------|----------------------|
| Ranunculus bulbosus. | Adoxa Moschatellina. |
| Papaver Rhœas. | Cichorium Intybus. |
| Erophila vulgaris. | Euphorbia Peplus. |
| Trifolium arvense. | Orchis mascula. |
| Prunus Avium. | Habenaria bifolia. |
| Chærophyllum temulum. | Botrychium Lunaria. |

(*C. E. Salmon.*)

- | | |
|--|---|
| Rubus rhamnifolius, <i>f.</i> | } All determined by <i>Rev.</i>
<i>Moyle Rogers.</i> |
| „ sulcatus | |
| „ pulcherrimus | |
| „ dumnoniensis | |
| „ Radula, <i>var. anglicanus</i> | |
| „ corylifolius, <i>var. cyclophyllus</i> | } |
| Agrimonia Eupatoria. | Utricularia minor. |
| Pyrus Aria. | Potamogeton alpinus. |
| Eupatorium cannabinum. | „ heterophyllum. |
| Gnaphalium sylvaticum. | Rhynchospora alba. |
| Lobelia Dortmanna. | Isoëtes lacustris. |
| Gentiana baltica. | |

(*Messrs. Somerville and Playfair.*)

- | | |
|--|-------------------------------|
| Hypericum elodes, <i>sp.</i> | Veronica Buxbaumii. |
| Myriophyllum alternifolium, <i>sp.</i> | Scutellaria minor, <i>sp.</i> |
| „ spicatum, <i>sp.</i> | Betula verrucosa. |
| Scandix Pecten-Veneris, <i>sp.</i> | Juniperus communis. |
| Taraxacum palustre, <i>sp.</i> | Sparganium minimum. |
| Erythræa littoralis. | Scirpus fluitans. |

103. MID EBUDES.

†*Inula Helenium* }
Arctium minus } *S. M. Macvicar.* Potamogeton prælongus, *sp.*

104. NORTH EBUDES.

Epilobium obscurum (Eigg), *S. M. Macvicar.*

106. EAST ROSS.

Festuca arundinacea, *Marshall and Shoolbred*, 1897.

107. EAST SUTHERLAND.

(*Marshall and Shoolbred*, 1897.)

<i>Cardamine flexuosa.</i>	<i>Circæa alpina.</i>
<i>Cochlearia grœnlandica.</i>	<i>Conium maculatum.</i>
† <i>Sisymbrium Sophia.</i>	<i>Pimpinella Saxifraga.</i>
„ <i>Thalianum.</i>	<i>Arctium nemorosum.</i>
<i>Cakile maritima.</i>	<i>Hieracium buglossoides</i> , Arv.
<i>Viola canina.</i>	Touvet.
„ <i>Curtisii.</i>	<i>Erythræa littoralis.</i>
<i>Lychnis alba.</i>	<i>Myosotis collina.</i>
<i>Sagina maritima.</i>	† <i>Verbascum Thapsus.</i>
„ <i>nodosa.</i>	<i>Atriplex Babingtonii.</i>
<i>Spargularia rubra.</i>	„ <i>laciniata.</i>
„ <i>marina.</i>	<i>Salicornia herbacea.</i>
„ <i>neglecta</i> (media).	<i>Suæda maritima.</i>
† <i>Malva sylvestris.</i>	<i>Juniperus communis.</i>
<i>Rosa hibernica</i> , <i>var. glabra.</i>	<i>Carex extensa.</i>
<i>Sedum anglicum.</i>	<i>Holcus mollis.</i>

108. WEST SUTHERLAND.

(*Marshall and Shoolbred.*)

<i>Thalictrum collinum.</i>	<i>Solanum Dulcamara.</i>
<i>Caltha</i> “ <i>radicans.</i> ”	<i>Anagallis tenella.</i>
<i>Rubus Balfourianus.</i>	<i>Salicornia herbacea.</i>
<i>Hieracium stenolepis</i> , Lindeb.,	<i>Goodyera repens.</i>
<i>var. anguinum</i> , W. R. Linton.	

110. OUTER HEBRIDES.

(*W. A. Shoolbred, sps.*)

<i>Hieracium Boswelli</i> , Linton.	<i>Potamogeton crispus.</i>
„ <i>Oreades, var. sub-</i>	<i>Sparganium microcarpum.</i>
<i>glabrum</i> , F. J. Hanb.	<i>Carex teretiuscula.</i>
<i>Hieracium rivale</i> , F. J. Hanb.	„ <i>Sadleri</i> , Linton.

112. SHETLAND ISLES.

Petasites officinalis
Phragmites communis (confirmed) } *Beeby, sp.*

TOPOGRAPHICAL BOTANY OF SCOTLAND.

By JAMES W. H. TRAIL, A.M., M.D., F.R.S.

(Continued from p. 235, October 1898.)

[Names of plants in *italics*, except as synonyms within curved brackets, denote that the plants were *certainly* introduced into Scotland by man. † after a district-number denotes introduction by man into the district; "cas." denotes casual occurrence, and "esc." evident escape or outcast from cultivation, both being due to man's agency. Square brackets enclosing the name of a plant or a district-number denote that the record was made in error. ? after a district-number denotes, at least, need of confirmation; after † it denotes doubt as to whether the plant owes its presence in the district to man.]

SOLANACEÆ.

- ¹ *Solanum Dulcamara*, L., *except* 78, 79, 84, 97, 98, 101, 103, 104, 105, 107, 109, 110, 112.
² *S. nigrum*, L., 74, 75†, 80†, 81†, 83†, 84†, 85†, 86†, Perthshire†, 90†, 92 cas., 98†, 100†.
S. tuberosum, L., a frequent casual; sometimes in unexpected places, e.g. near top of Corryhabbie Hill, in Banffshire.
Lycopersicum esculentum, L., casual, e.g. in 92.
Lycium barbarum, L., 85†.
Atropa Belladonna, L., †, or casual, in 72, 75-77, 81-83, 85-88, 89 (?), 90, 95, 103.
Datura Stramonium, L., casual in 73, 74.
³ *Hyoscyamus niger*, L., 72, 74†, 75, 76 (?), 80-83, 85, 86, 88†, 89†, 90, 91†, 92†, 107 cas.
(NOLANACEÆ.—*Nolana prostrata*, L., casual, e.g. in 92.)

SCROPHULARIACEÆ.

- ⁴ *Verbascum Thapsus*, L., 72-78, 81-84, 85†, 86-90, 91†, 92†, 95†, 96†, 99†, 100, 107 cas., 109†, 111†.
[V. pulverulentum, Vill., reported, but in error, from 94.]
V. Lychnitis, L., escape, 85†, 86†, Perthshire†, 99†.
V. nigrum, L., 81†, 82†, 83†, 85†, 86† 88 cas., 89 cas., 99†.
Linaria Cymbalaria, Mill., † or casual, in 72-75, 77, 82-86, 88, 89, 95, 99.
L. Elatina, Mill., 86†, 99†.
L. purpurea, L., 74 cas., 92†.

¹ *Solanum Dulcamara*, L.—In north-east Scotland this grows only in habitats suggestive of man's agency.

² *S. nigrum*, L.—Probably introduced by man into every habitat in Scotland.

³ *Hyoscyamus niger*, L. } Both species should probably have † after most

⁴ *Verbascum Thapsus*, L. } (perhaps all) of the vice-comital numbers.

- L. repens*, Mill., 75†, 83†, 86†, 88†, 89†, 90†, 92†.
¹ *L. vulgaris*, Mill., *except in 96, 97, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112.*
² *L. viscida*, Mœnch (*L. minor*, Desf.), 72, 73, 75, 77, 80, 81, 85†, 86†, 88†, 89†, 91†, 99†.
Antirrhinum majus, L., 74 esc., 83 esc., 85 esc., 86 esc., 89 esc., 92 esc.
Scrophularia aquatica, L., 72, 73, 74, 75, [76, 77], 81, 83 (?), [84, 85, 87], III (?).
b. cinerea, Dum., 88 cas.
S. umbrosa, Dum. (*S. Ehrharti*), 75, 76 (?), 77, 80, 81, 83, 84, 85.
S. nodosa, L., *except 111, 112.*
S. vernalis, L., 72†, 73†, 82†, 83†, 85†, 86†, 88†, 89†, 92†.
Mimulus luteus, L., † in 72-75, 83, 85-94, 99, 100, 102.
M. guttatus, 91†, 92†.
M. moschatus, casual, "on river-shingles," in Perthshire, 92 cas.
Limosella aquatica, L., 74 (?), 75, 82, 90, 91.
Digitalis purpurea, L., *except 112.*
D. ambigua, Murr., casual, in 88.
³ *Veronica hederæfolia*, L., *except 78, 98, 100, 103, 104, 105, 110.*
V. polita, Fr., *except 73, 75, 76, 93, 94, 95, 96, 97, 98, 102, 103, 104, 106, 107, 108, 110.*
V. agrestis, L., all.
⁴ *V. Tournefortii*, C. Gmel. (*V. Buxbaumii*, Ten.), *except 76, 79, 97, 99, 104, 105, 107, 108.*
V. peregrina, L., weed in nurseries at Perth.
V. arvensis, L., all.
V. serpyllifolia, L., all.
b. humifusa (*Dicks.*), 72, 87-90, 92, 94, 96-98, 105, 108.
⁵ *V. alpina*, L., 72, 86-90, 92, 94, 96, 97.
V. fruticans, Jacq. (*V. saxatilis*, L.), 88-90, 94, 97, 98 (?), 108 (?).
V. officinalis, L., all.
V. Chamædrydys, L., *except 110.*

¹ *Linaria vulgaris*, Mill., of frequent occurrence by waysides, indicates human agency in its introduction by its habitat in many localities.

² *L. viscida*, Mœnch, should probably be ranked as an introduction into Scotland by man. It tends especially to spread along railway lines in the "ballast."

³ *Veronica*, L.—Several of the species are so much weeds of cultivation as to probably owe their wide diffusion, if not their introduction into Scotland, to man.

⁴ *Veronica Tournefortii*, C. Gmel.—This has become much more abundant, at least in north-east Scotland, in recent years. It now appears quite as much at home in many fields as does *V. agrestis*.

⁵ *V. alpina*, L.—In "Top. Bot." this is given from "86, Stirling, Ben Lomond"; but I do not find it in the list in "Notes on the Flora of Stirlingshire," by Colonel Stirling and R. Kidston.

- V. montana*, *L.*, *except* 74, 78, 84, 85, 91, 92, 93, 97, 100, 101, 105, 107, 108, 109, 110, 111, 112.
- V. scutellata*, *L.*, *except* 84.
- V. Anagallis-aquatica*, *L.*, *except* 84, 94, 99, 104.
b. anagalliformis, *Bor.*, 109.
- V. Beccabunga*, *L.*, all.
- EUPHRASIA, *L.* The records for this genus chiefly follow Mr. F. Townsend's paper in the "Journal of Botany" (1897), with additional records since its publication, 'Notes of a Tour in North Scotland,' by Rev. E. S. Marshall and W. A. Shoobred, and 'Notes from Cantire,' by Mr. C. E. Salmon, both in the same journal (1898, pp. 173-174).
- E. borealis*, *Wttst.*, 92, 96, 98, 106-109, 111, 112.
- E. brevipila*, *Burn.* and *Gremli*, 87, 88, 92, 95, 98, 101, 105, 108, 109.
- E. nemorosa*, *Mart.*, 92, 112.
- E. curta*, *Fr.*, Perth, 92, 97, 108, 109.
var. glabrescens, *Wttst.*, 106, 107.
- E. occidentalis*, *Wttst.*, 97, 108.
- E. latifolia*, *Pursh*, 108.
var. grandiflora, *Wttst.*, 108.
- E. foulaensis*, *Towns.*, 88, 92, 107-109, 111, 112.
- E. gracilis*, *Fr.*, 88, 92, 96-98, 101, 105, 108, 109, 112.
var. Friesii, *Sanio*, 92.
var. primaria, *Fr.*, 92, 105.
- E. scotica*, *Wttst.*, 92, 96-98, 101, 105, 108, 109, 112.
- E. Rostkoviana*, *Hne.*, 98, 105, 109.
- Bartsia Odontites*, *Huds.*, *except* 112.
a. verna, *Reichb.*, 88, 110.
b. serotina (*Reichb.*), Perthshire, 110.
c. litoralis, *Reichb.*, 97, 107, 108.
- B. viscosa*, *L.*, 73, 74, 76† (reported by Sonntag for, 85, 86), 98-101.
- B. alpina*, *L.*, 88, 97 (?), 98, 105 (?).
- Pedicularis palustris*, *L.*, all.
- P. sylvatica*, *L.*, all.
- Rhinanthus Crista-galli*, *L.*, all.
b. Drummond-Hayi, *F. B. White*, Perthshire, 108.
- ¹ *R. major*, *Ehrh.*, 81, 85, 90, 91†, 92†, 93†, 95, 96, 106, 111, 112.
- Melampyrum pratense*, *L.*, *except* 78, 112.
d. montanum, *Johnst.*, 72 (?), 74, 86-89, 95, 96, 103.
e. hians, *Druce*, 74, 95, 108.
- M. sylvaticum*, *L.*, 73, 75, 80, 81, 83 (?), 87-92, 94, 95 (?), 96, 99, 105, 106, 109, 111 (?).

¹ *Rhinanthus major*, *Ehrh.*, has been observed only within quite recent years in 91 and 92 in a stackyard and among cereals and artificial pastures. These habitats clearly indicate human agency.

OROBANCHACEÆ.

- Orobanche major*, *L.*, 72, 73, [85, 88].
O. rubra, *Sm.*, 73, 74, 85, 97, 98, 102-105, 110.
 [O. *elatior*, *Sutton*, recorded from 98, probably in error.]
O. cruenta, *Bertol.*, 98.
O. minor, *Sm.*, 85†.
Lathræa squamaria, *L.*, 72, 73, 75-77, 79-81, 83, 86-89, 97.

LENTIBULARIACEÆ.

- Utricularia vulgaris*, *L.*, except 76, 77 (?), 78, 84, 86, 87, 101, 102, 103, 104, 105, 107, 108, 109.
U. neglecta, *Lehm.*, 72, 73, 75, 79 (?), 80, 90, 97, 98, 99 (?), 100 (?), 105, 106 (?), 110 (?).
U. minor, *L.*, except 76, 78, 79, 80, 82, 84, 93, 103, 106, 107, 109.
U. intermedia, *Hayne*, 72-74, 81, 87-92, 95-108, 110, 112.
 (? *U. Bremii*, *Heer*, 74 ?.)
Pinguicula vulgaris, *L.*, except 78.
P. alpina, *L.*, 104, 106, 108 (?), 111 (?).
P. lusitanica, *L.*, 73-75, 88, 96-98, 100-111.

VERBENACEÆ.

- Verbena officinalis*, *L.*, 85†, 88 cas., 92 cas.

LABIATÆ.

- Mentha rotundifolia*, *L.*, 83†, 85†, (90† (?) extinct), 94†.
¹ *M. alopecuroides*, *Hull*, 74, 86†, 88, 100.
M. longifolia, *Huds.* (*M. sylvestris*, *L.*), 72-73, 81-83, 86†, 88-90, 95†, 96, 99, [100], 107†.
 b. nemorosa, 89.
 c. mollissima (*Borkh.*), 88, 89.
M. viridis, *L.*, 72†, 73†, 74†, 75†, 83†, 85†, 88†, 89†, 92 esc., 100.
² *M. piperita*, *L.*, 72†, 73†, 74†, 75†, 79-81, 83, 85, 86, 88-90, 91†, 92†, 99, 106.
M. hirsuta, *L.*, all.
 b. subglabra (*Baker*), 74.
M. sativa, *L.*, 72-77, 80-89, 91, 92, 95, 97, 99-102, 105, 108.
 b. paludosa (*Sole*), 74, 88, 89.
 c. subglabra, *Baker*, 88, 89.
M. rubra, *Sm.* (?), 88, 89.
M. arvensis, *L.*, except 104, 107, 110, 112.

¹ *Mentha alopecuroides*, *Hull.* } The species of *Mentha* have so long been

² *M. piperita*, *L.* } favourites in cottage-gardens, and have such powers of establishing and spreading themselves along streams, that some, or many, of the habitats of the favourite kinds must certainly be relics of man's agency.

- M. Pulegium, *L.*, 72†, 75, 81, 83†, 85†, 109†.
 Lycopus europæus, *L.*, 72-78, 80 (reported by Sonntag from, 82, 83), 84-89, 91, 92, 95-98, 100-102, 105, 106.
 Origanum vulgare, *L.*, 72†, 73†, 74-77, 79-81, 83-91, 92† (?), 94, 95†, 102, 109.
 Thymus Serpyllum, *Fr.*, all.
 b. prostratum, *Hornem.*, 105, 108, 112.
 T. Chamædrys, *Fr.*, 74 (82, Sonntag), 96, 103, 104, 109, 110.
 Calamintha Clinopodium, *Spenn.*, 72 (?), 74, 75 (?), 76, 77, 79-81, 83-92, 94-96, 99.
 C. arvensis, *Lam.* (*C. Acinos*, *Clairv.*), 73†, 74, 75, 77, 80-83, 85, 88-92, 95, 96, 107.
C. officinalis, *Mœnch*, 87†, a doubtful record.
 Salvia Verbenaca, *L.*, 75, 81, 83, 85, 86, 90, 106.
 Nepeta Cataria, *L.*, 77†, 81†, 86†, 87 cas., 107†, 112†.
 N. Glechoma, *Benth.*, *except* 78, 104, 107, 108, 110, 111† (?), 112.
 Scutellaria galericulata, *L.*, *except* 78, 85, 92†, 109, 111, 112.
 S. minor, *Huds.*, 73-75, 77 (?), 86, 97-104, 110.
 Prunella vulgaris, *L.*, all.
 Marrubium vulgare, *L.*, 72†, 73†, 75† (?), 80† (?), 81†-83†, 85† (?), 87 cas., 95† (?).
 Stachys Betonica, *Benth.*, 72-75, 76 (?), 77†, 80, 81, 83, 84 (?), 85, 88, 89, 104 (?).
 S. palustris, *L.*, all.
 var. canescens, *Lange*, 105.
 palustris × sylvatica (*ambigua*, *Sm.*), 72 (?), 73, 74, 76 (?), 77 (?), 80, 81 (?), 82, 83 (?), 87, 88, 92 (?), 96 (?), 97, 98, 100 (?), 101 (?), 102, 104, 105, 107, 108† (?), 109, 111, 112.
 S. sylvatica, *L.*, all.
 S. arvensis, *L.*, *except* 78, 79, 86, 98, 109, 112.
 S. italica, *Mill.*, 92 cas.
 Galeopsis Ladanum, *L.* } The name *G. Ladanum*, *L.*, is recorded
 G. angustifolia, *Ehrh.* } from the following—75, 80†, 82, 83, 85, 86, 92†, 95†, 99, 104 (?), 111 (??); while *G. angustifolia*, *Ehrh.*, is recorded from 89: but since these plants were not clearly distinguished in the earlier lists, reliance can be placed on the records only as regards *G. Ladanum* in the aggregate.
 G. versicolor, *Curt.*, *except* 74, 82, 84, 107, 108, 109, 110, 112.
¹ G. Tetrahit, *L.*, all.
 Lamium amplexicaule, *L.*, *except* 97, 99, 102, 104, 112.
 L. intermedium, *Fr.*, *except* 79, 81, 84, 86, 88, 94, 97, 99, 104, 106, 107.

¹ *G. Tetrahit*, *L.*—Varies greatly in the flowers. The variety *bifida* (*Bœnn.*) probably grows in many districts. It has been recorded from 72, 74, 87-89, 91-93, 111.

- L. hybridum*, *Vill.*, except 72, 73, 74, 75 (?), 79, 82, 91, 93, 96, 97, 101, 103, 104, 105, 106, 107, 108, 109.
- L. purpureum*, *L.*, all.
b. decipiens, *Sonder*, 86.
- L. maculatum*, *L.*, an escape in many counties, e.g. 73, 75, 86, 88, 89, 91, 92, 93.
- ¹ *L. album*, *L.*, except 93, 97, 98, 100, 101, 102, 103, 104, 105, 106, 107, 108, 110, 112.
- L. Galeobdolon*, *Crantz*, escape in 72, 75, 82, 83, 84, 97, 98 (?).
- Ballota nigra*, *L.*, 75, 76 (?), 77†, 80, 81, 82 (?), 83, 85 (?), 86†, 87 cas., 92†, 95†.
a. foetida, *Koch*, 87 cas.
b. ruderalis, *Koch*, 86.
- Teucrium Chamædryas*, *L.*, 75†, 89† (extinct), 92† (extinct).
- T. Scorodonia*, *L.*, except 112.
- Ajuga reptans*, *L.*, except 78.
- A. pyramidalis*, *L.*, 72, 96 (?), 97, 98, 104, 106-111.

PLANTAGINEÆ.

- Plantago major*, *L.*, all.
- ² *P. media*, *L.*, 72, 73, 75, 77†, 80-83, 85, 86, 87†, 88†, 89†, 90, 91, 92†, 93†, 97†, 99†, 111 (?), 112†.
- P. lanceolata*, *L.*, all.
var. eriophylla, *Dene.*, 112.
var. capitata, *Presl.*, 112.
- P. maritima*, *L.*, except 77, 78, 79, 80, 84, 86.
var. minor, *Hook. and Arn.*, 108, 109.
var. hirsuta, *Syme.*, 111.
var. pygmæa, *Lange*, 110, 112.
- P. Coronopus*, *L.*, except 77, 78, 79, 80, 86, 88.
var. pygmæa, *Lange*, 108, 109, 112.
var. ceratophylla, *Rapin*, 108.
- P. arenaria*, *Waldst. and Kit.*, introduced here and there, e.g. near Aberdeen. It does not seem to keep its footing.
- Littorella juncea*; *Berg.*, except 78.

ILLECEBRACEÆ.

- (*Herniaria glabra*, *L.*, has been recorded from 81, and from 88 or 89, but is not sufficiently vouched. *b. subciliata*, *Bab.*, has been found as a casual at Perth.)
- Scleranthus annuus*, *L.*, except 98, 103, 104, 110, 111, 112.
(*S. perennis*, *L.*, has been recorded from Forfarshire, in error.)

¹ *L. album*, *L.*—This seems in many localities in Scotland, if not in most, to be an introduced plant.

² *P. media*, *L.*, may not be native anywhere in Scotland. Wherever I have seen it, there seemed little doubt of its introduction among agricultural seeds.

AMARANTHACEÆ.

Amaranthus retroflexus, L., an occasional casual, e.g. near Aberdeen.

CHENOPODIACEÆ.

¹ *Chenopodium polyspermum*, L., 81, 90 (?).

C. Vulvaria, L., 73 cas., 82 (?), 83, 85 (?).

C. album, L., all.

The varieties *incanum*, Moq., *viride*, Syme, and *viridescens*, St. Am., have been recorded from various counties in Scotland.

C. opulifolium, Schrad., casual, in 92.

(*C. murale*, L., has been recorded from 80 and 90, but the records have not been confirmed.)

C. hybridum, L., reported as rare introduction in, 82, 83, 84, 85.

C. urbicum, L., 72 cas.

b. intermedium, Moq., 81†, 83†. (Recorded for 92, but not confirmed. Probably an error.)

C. rubrum, L., 74-76, 77†, 81, 83, 85, 87† (92, an error), 99†, 108.

C. glaucum, L., 85†.

² *C. Bonus-Henricus*, L., except 97-99, 101-104, 108, 110-112.

Beta maritima, L., 73, 74, 82†, 83-85, 87† (?), 102.

Atriplex littoralis, L., 74, 81, 82, 83 (?), 84, 85, 87, 92 cas., 97, [106, 108], 111.

b. serrata, Moq., 73, 74.

A. patula, L., except 78, 79, 84, 97, 101, 103, 105, 107.

b. erecta, *Huds.*, 72-74, 76-78, 81-86, 90, 96, 100-104, 110-112.

c. angustifolia (*Sm.*), 72-78, 81-87, 90, 91, 95-97, 99-102, 104, 107-112.

A. calotheca, *Fries*, 74 (shingle at Stranraer, in August 1898, *G. C. Druce*, named by Herr Freyn), 106, 107 (?), (see *Ann. S. N. H.*, 1899, p. 119).

A. hastata, L., 72-74, 87, 105, 110.

A. deltoidea, *Bab.*, 72 ("Top. Bot.," but not in "Fl. of Dumfries"), 73, 74, 80†, 81, 83, 86, 104 (?), 107, [112 ?].

A. Babingtonii, *Woods*, except, 72, 77, 78, 79, 80, 86, 88.

b. virescens, *Lange*, 74.

A. laciniata, L., 74-76, 83 (?), 85 (?), 87, 90 (?), [92, error], 95 (?), 96-98, 99 (?), 100-104, 106 (?), 107, 108, 110, 111 (?).

¹ *Chenopodium*, L.—The records for this genus are unreliable, the species being so frequently mistaken. Some records are certainly erroneous, and others marked as requiring confirmation are probably so. The habitats of all the species (rubbish-heaps, near houses, and waysides) indicate the probability of introduction and diffusion by man. Even *C. album* shows this dependence markedly.

² Probably an introduction in all parts of Scotland, though now well established in many counties, and recorded without comment from a good many. Its habitats, as I have seen them, are always suggestive of man's agency.

- A. portulacoides*, *L.*, 74, 75, 83 (?), 89 (?).
Salicornia herbacea, *L.*, except 77, 78, 79, 80, 81, 84, 86, 88, 89, 93 (?), 94-109.
 (*S. radicans*, *Sm.*, has been recorded from 90, probably in error.)
Suaeda maritima, *Dum.*, except 72 (?), 77, 78, 79, 80, 81, 88, 89, 94, 96, 108, 109.
 b. procumbens, *Syme*, 75, 100, 106, 107, 110, 111.
Salsola Kali, *L.*, except 76, 77, 78, 79, 80, 86, 88, 89, 99, 105, 108, 111, 112.
S. Tragus, *L.*, casual, in 92.

POLYGONACEÆ.

Polygonum Convolvulus, *L.*, except 111†, 112.

P. aviculare, *L.*, all.

Too little attention has been given to the occurrence of the varieties of this species in Scotland to permit of indicating their distribution.

P. equisetiforme, *Sibth.*, casual, in 92.

P. Raii, *Bab.*, 72-76, 82, 83, 85, 87, 98, 100-103, 110, 112 (?).

(*P. maritimum*, *L.*, has been recorded from 74 and 75, perhaps in error for *P. Raii*.)

P. Hydropiper, *L.*, except 78, 93, 106, 107, 108, 109, 111 (?), 112 (?).

P. minus, *Huds.*, 72, 73, 76, 77, 85 (Sonntag), 87-89, 90 (?), 91, 92.

P. Persicaria, *L.*, all.

b. elatum, *Gr.* and *Godr.*, 89, 110.

P. lapathifolium, *L.*, except 79, 84, 93, 94, 103, 104, 107.

P. maculatum, *Dyer* and *Trimen*, 85, 87, 97.

P. amphibium, *L.*, all.

P. Bistorta, *L.*, 72-74, 76-78, 80, 81, 84-95, 98, 100, 102, 104, 106, 109-112. Certainly an introduction in most of the counties north of the Forth, perhaps throughout Scotland, though now so well established as to appear in many localities to be indigenous.

P. viviparum, *L.*, except 73, 74, 76, 77, 78, 79, 80, 81, 82, 83, 84, 100, 101, 102, 103, 105, 107, 109.

b. alpinum, *Wallr.*, 112.

Fagopyrum esculentum, *Moench*, casual, in cultivated fields usually, *e.g.* in 91, 92.

Oxyria digyna, *Hill*, 72 ("Pentland Hills, Lomond Hill," *Sonntag*), 86-100, 103-112.

Rumex conglomeratus, *Murr.*, except 72, 79, 95, 96, 98, 101, 111 (?), 112 (?).

R. sanguineus, *L.*, except 79, 90† (?), 96, 97, 98, 103, 104, 105, 106, 107, 108, 109, 110, 111†, 112.

b. viridis (*Sibth.*), 72-75, 83, 85-87, 89, 92-94, 103, 106, 108.

- R. maritimus*, *L.*, 72 (?), 81†, 85 (?), 86 cas., 87, [92, 94, probably errors], 104†, 111 (?).
 (*R. limosus*, *Thuill.*, recorded from 75, 82, 90, requires further proof.)
R. pulcher, *L.*, recorded from 75, 77, requires further proof; 80, casual on ballast.)
R. obtusifolius, *L.*, *except 103*.
R. crispus, *L.*, all.
 crispus × *domesticus* (*propinquus*, *Aresch.*), 112.
 crispus × *obtusifolius* (*R. acutus*, *L.*), 78, 80, 81, 83, 85, 87-89, 92, 97, 100, 105, 111, 112.
R. domesticus, *Hartm.*, *except 82, 99* (?), 100, 101, 102, 103, 106.
 domesticus × *obtusifolius* (*R. conspersus*, *Hartm.*), 78, 80, 81, 85, 87, 88, 91, 92, 96, 97, 105, 111, 112.
R. Hydrolapathum, *Huds.*, 73†, 75, 77†, 80, 81, 85, 88, 89, 90 (?), 93 (?), 96, 99 (?), 102.
 b. latifolius, *Borr.*, 88.
R. alpinus, *L.*, 72†, 73†, 74†, 75†, 83†, 85†, 88†, 89†.
R. Acetosa, *L.*, all.
R. scutatus, *L.*, rare escape in, 83, 85.
R. Acetosella, *L.*, all.

(*To be continued.*)

ON MOSSES OF THE GENUS *CAMPYLOPUS*

By JAMES STIRTON, M.D., F.L.S.

THE western portions of Scotland, and more especially the outer Hebridean Islands, are singularly prolific of species of the genus *Campylopus*—a genus only meagrely represented in Europe, although largely so in America. There is, however, a strong probability that the species are not yet sufficiently investigated. The diversity in form and appearance of the species, especially from the Outer Islands, forms a barrier to their study, inasmuch as this diversity renders them somewhat puzzling and even perplexing to the bryologist. Benbecula, one of this group of islands, is perhaps the richest in species and varieties. In places such species seem to constitute the usual undergrowth instead of grass, and one may tread over patches of *Campylopus brevipilus* many yards in extent.

I have again gone over my large collections of species gathered in these islands, and have picked out two which

cannot be identified with any hitherto known to me. The first described has peculiarities such as to warrant its being included in a new subgenus.

In the following measurements of cells, etc., the micro-millimetre, or the millionth part of a metre, is taken as the unit. This unit is now generally indicated by the Greek letter μ . This letter will, however, not be appended in any case, so that 8, for instance, means 8 micro-millimetres.

A review of species of *Campylopus* sent to me from various parts of the world has enabled me to associate the moss in question with one from New Zealand, placed by Mr. Mitten in the genus *Trichostomum*, under the name *Tr. leptodum*. This is *Campylopus leptodus* of Montagne. The habit of the moss is entirely that of a *Campylopus*, but Mr. Mitten, finding the teeth of the peristome slender and split nearly to base, decided, on this peculiarity alone, to classify it with the *Trichostoma*. I prefer to refer it to a subgenus which Mitten has named *Pilopogon*. There is, however considerable dubiety as to whether the specimens in my possession from New Zealand are identical with the moss described by Mitten in Hooker's "Flora of New Zealand," inasmuch as my specimens have the broad nerve of *Campylopus*, whereas the nerve is there spoken of as "slender." As I have not hitherto been able to obtain authentic specimens of Mitten's moss, it might be as well, in the absence of fruit in the Scottish specimens, to constitute a new subgenus under the name *Trachypogon*.

The following is the diagnosis of the Scottish species:—

CAMPYLOPUS (TRACHYPOGON) AURESCENS.—Tufts densely cæspitose, yellow or golden yellow above, pale brown beneath; stems 1 to 2 inches in height, stoutish, sparingly dichotomous, often fastigiatly branched above, sparingly radiculose below, fasciculate-leaved; leaves lanceolate or lanceolate-subulate above, tipped with a longish denticulate hyaline hair, margin incurved throughout; nerve $\frac{1}{4}$ to $\frac{1}{3}$ the width of leaf a little up from base—a cross-section shows it thickened in middle and often bulging behind, with two rows of opaque cells, the anterior row showing cells 5 to 9 in diameter, the posterior 4 to 6 diameter. In the middle of nerve in front are occasionally seen traces of very minute cells, 3 to 4 in diameter, and 3 to 6 in number, as in *Dicranum* or *Campylopus alpinus*, but these cells are often entirely suppressed. The cells of

pagina near apex are long, thin, and undulating, 30 to 45 by 3 to 5. The lower cells next nerve are large, irregularly rhomboid, 35 to 50 by 10 to 14, and have numerous osculating mammillæform prominences, which are occasionally seen connected by slender tubes, lateral as well as apical, 1.5 to 2 in diameter. External to these cells are long undulating cells, with numerous oil globules in single series as in *Dicranum scoparium*, 50 to 80 by 5 to 8: the marginal cells are long and very narrow. The alar spaces are as a rule well developed, composed of large hexagonal cells with thick walls, colourless at first, then coloured red next the nerve, ultimately coloured red throughout. On the ground, Benbecula, 1886.

The main points of distinction are, the constitution of the nerve, the presence of connecting pores, the peculiar character of the rest of the areolation, and the absence of any projecting posterior cells on the nerve.

An examination of my specimens of the New Zealand *C. leptodus* revealed a structure of the leaf similar to that of the present moss, viz. large irregular cells near the central base, having mammillæform prominences connected occasionally by slender tubes. The rest of the areolation is, however, quite different, having cells much shorter and thicker, and therefore of a different shape; but the apices have longish denticulate hyaline points. Projecting posterior cells are also present in upper third of nerve.

CAMPYLOPUS SUBCINEREUS, *n. sp.*—Tufts densely cæspitose, from one to two inches in height, fuscous below, greenish or glaucous green near apex, sparingly rufo-radiculose; leaves, dense, erectopatent, straight, narrowly lanceolate-subulate from a slightly ovate base, denticulate at the apex; nerve $\frac{2}{3}$ breadth of leaf near the base, *not sulcate* on back, in section shows 3 strata of cells, the anterior row consisting of large pellucid cells, 12 to 22 diameter, the middle row of small, mostly opaque, but here and there pellucid, cells, 4 to 7 diameter, the posterior row of smaller opaque cells, 3 to 5 diameter; cells of pagina near central base oblongo-hexagonal, 25 to 40 by 8 to 10, marginal cells numerous, very narrow and elongate; auricles either absent or only slightly developed. On the ground, Benbecula, 1886.

This moss differs in several important particulars from *C. pyriformis*. The tufts are much denser, nerve broader, different in constitution, smooth on back, with no projecting posterior cells. In *C. pyriformis* the cells of the anterior row of the nerve are pellucid and from 9 to 12 diameter, the cells of the middle row only slightly smaller, 7 to 11 diameter, and areolation near base much laxer.

I cannot close this record without referring to another *Campylopus* from the summit of Snowdon gathered in 1865 by the late Mr. G. E. Hunt, who sent me specimens of it. In a note appended, he says:

“Has laxer structure of nerve than usual.” I have now had an opportunity of re-examining the nerve in cross-section, and I am of opinion that this moss deserves a varietal (if not a specific) place amongst the *Campylopi*.

CAMPYLOPUS HUNTI.—Stems loosely aggregated, from one to two inches in height, stoutish, sparingly pallido-tomentose; leaves erect, slightly secund, loosely set, elongating upwards until at apex they form a somewhat cuspidate cluster, lanceolate acuminate, denticulate at apex; nerve $\frac{1}{2}$ breadth of leaf near base, of 4 strata of cells, those of the anterior row large and pellucid, 12 to 20 diameter, behind this another pellucid row, 7 to 12 diameter, next a row of cells very often pellucid, 5 to 9 diameter, on the back projecting detached pellucid cells, 6 to 9 in height. The cells of the first three rows are enlarged downwards, until near the base the nerve is of a spongy texture, composed of large pellucid cells with very little connective or intercellular tissue. The cells of the posterior projecting row become shallower downwards, and nearly disappear just above the base. There are auricular spaces at base composed of large colourless cells, about 60 by 30; but these spaces do not bulge beyond the margin, but resemble the corresponding spaces in some *Dicrana*. The lower cells of the pagina are quadrate, 30 to 40 by 12 to 17, and diminish in size upwards, until near the apex of pagina (which extends only one-third up the leaf) they are still sharply quadrate or at times somewhat rhomboid, and 8 to 11 by 4 to 6. The marginal basal cells are narrow, but not so narrow as usual.

Mr. Hunt remarks: “On the ground with *Bryum gracile*. Between *C. fragilis* and *C. Schwarzii*.” I agree with him. The auricles, which are distinct and composed of cells differing in size and appearance from the rest of the areolation, remain, at times, on the stem, unless care is taken to detach the leaves from the stems slowly backwards.

Lastly, I may be allowed to remark generally that the pellucid bulging posterior cells on the nerve seen in many *Campylopi* are apt to be flattened or even squashed if sections of the nerve are made after the leaves have been tightly bound in cork for some time, or they collapse in a few instances after the specimens have been retained for years in the herbarium.

I may take an early opportunity of reviewing the European species of the genus *Campylopus*, more especially as I am beginning to perceive that I must modify my views of one or two of the species.

THE WILD BIRDS PROTECTION ACTS.

[WE desire to call special attention to the important and praiseworthy action taken by the Perthshire Society of Natural Science towards furthering the cause of the Protection of Wild Birds and their Eggs in County of Perth.

This is set forth in the circular reproduced below.

We are convinced that it is mainly to the landed proprietor to whom we must appeal for co-operation if much good is to accrue from the efforts now being made by the County Councils to protect the rarer and persecuted species which inhabit or visit the areas under their administration.

We heartily congratulate our Perth friends on their admirable and initiative action, and we cordially commend their excellent example to kindred Scottish Societies and Associations.—EDS.]

PERTSHIRE NATURAL HISTORY MUSEUM,
TAY STREET, PERTH, *Jan.* 23, 1899.

Sir—At a Meeting of the Perthshire Society of Natural Science, held on Thursday, 12th inst., the subject of the Protection of Wild Birds in Perthshire was brought forward by Col. Campbell, H.M. General Prison, Perth. After full consideration, it was resolved to communicate with the principal Proprietors in the County, drawing their attention to the scheme for the Protection of Wild Birds, formulated by the Secretary of State for Scotland, and adopted by the County Council of Perthshire, and to ask their earnest co-operation in this matter.

The Council of the Society are convinced that if the Land Owners in Perthshire will use their influence with the Farmers, Foresters, Gamekeepers, Gardeners, Shepherds, and others on their estates, to prevent the catching or killing of the Birds which are scheduled, and the taking of the eggs referred to, the present destruction of bird life will be greatly diminished.

The Council beg to enclose a copy of the Order, and trust you will use your best endeavours to have its provisions carried into effect.—We are, etc.

ZOOLOGICAL NOTES.

Badger in Dumbartonshire.—The Glasgow evening papers of the 17th of February last announced that yesterday morning, while the head keeper to Mr. Alexander Crum Ewing of Strathleven,

Dumbartonshire, was going his round in the Murroch Glen, he found, caught by the leg in one of his vermin traps, a very fine female Badger. The specimen captured yesterday weighs 21 lbs., and its length is 35 inches. Mr. Wright, it may be stated, had some days previously noticed in the glen footmarks which he thought to be those of a fox, and for which the trap was set. When captured, the Badger was living, but had to be destroyed.—J. PATERSON and HUGH BOYD WATT, Glasgow.

Stoats in the Winter Pelage.—Has any one ever formulated a reasonable theory or rule that would cover the various apparently erratic changes that the fur of the Stoat (*Mustela erminea*) undergoes? It is very evident these changes do not depend on season. It may be that the age of different individuals is the ruling factor. At the very middle of the coldest winters, brown-furred individuals prevail alongside those clothed in white raiment. To-day (7th March) I have received a couple of Stoats clad in fur of a colour I was certainly not prepared to see at this late season, and more especially after such a winter—rather, I should say, after such a period of warm, muggy weather, distinguished by the almost entire absence of winter. These Stoats were from an inland locality, at an elevation of well under 200 feet above sea-level. One was as white as the Ermine ever is in this country, beautifully suffused with that fine tint of lemon colour which fades so soon. The other was not quite so white, as the brown was starting into view, but still sufficiently white to be notable at this time of year. Both were females.—ROBERT SERVICE, Maxwelltown, Dumfries.

Common Dolphins in the Tay Estuary.—On the 11th February of this year, some Broughty Ferry fishermen observed two Dolphins stranded in shallow water on the north side of the Tay, near its mouth—between Monifieth and Buddonness. Both were captured, and proved to be a female with its young one. The mother was easily caught, as it was quite stranded; but the babe, being able to swim in shallower water, was, unfortunately, so much injured in catching it as to be useless as a specimen. The Dolphin proved to be *Delphinus delphis*, was 6 feet 6 inches long, and was in milk. I understand that this species is rather a rare visitor to our coasts. I at once got a plaster cast made of the specimen, and we are also stuffing the skin and mounting the skeleton. The cast, skilfully painted, will be a better representation of the Dolphin than the stuffed skin.—JOHN MACLAUHLAN, Free Museum, Dundee.

[The authentic occurrences of this species in Scottish seas are few in number, though it is not uncommon on the southern shores of England. It has, however, occurred on our coasts as follows :—Firth of Forth (twice), Moray Firth (several), Shetland (once), off Mull (once), and is possibly not so rare in its visits as it is supposed to be.—EDS.]

Bird Notes from Carmichael, "Clyde" Area.—KINGFISHER (*Alcedo ispida*).—Last season this species nested on the banks of Carmichael Burn, beside the Manse. Four young ones were observed (4th June 1898). During the winter this bird has been by no means rare, and it is to be hoped that the pleasant experience of last season may be repeated.

BRAMBLINGS (*Fringilla montifringilla*) appeared on the 12th October, and have continued throughout the winter to be abnormally abundant. During frosty weather they simply swarmed wherever there were beech trees. At this date (16th March) they are still here. There is no more interesting sight than to watch the movements of an enormous flock of this species foraging, so active and graceful are they.

POCHARD (*Fuligula ferina*).—On 24th November 1898, Robert Barbour, Esq., younger, of Bolesworth, Cheshire, when duck shooting by the Clyde, killed a Pochard ♂, the first noted for this district. In addition to the Pochard, the following varieties were shot: Teal, Mallard, Golden-eye, Scaup, Tufted Duck, and Widgeon. On the 21st July, on coming from Glasgow, I saw a small flock of Pochard sitting quietly within stone-cast of the passing train on the sheet of water to the south of Wishaw Station. At this date, for a few days, the species was common in the district, as I also observed several small parties on the Clyde, near Prett's Mill Bridge.

TREE SPARROW (*Passer montanus*).—On 10th December a few individuals of this species were seen in the hedgerow beyond Cross-ridge Smithy, the place where they were observed in January 1897.—J. D. W. GIBSON.

Bramblings in Argyllshire.—During the past winter a large flock of Bramblings (*Fringilla montifringilla*) frequented the island of Innis Chonain in Loch Awe. They were first reported to me, as Snow Buntings, on the 12th of December, and it is possible that there may have been some birds of that species with them, though I was unable to find any. The people here seem to know the Snow Bunting, but not the Brambling. The winter had been exceptionally mild, but very stormy. The bird is said ("Fauna of Argyll," etc.) to occur apparently only in excessively severe seasons, and very few instances are known of its visits to the faunal region of Argyll.—CHARLES H. ALSTON, Allt-Garbh, Loch Awe.

Lesser Whitethroat in the Outer Hebrides.—A Scottish specimen of the Lesser Whitethroat (*Sylvia curruca*) is a *rara avis*, and the occurrence of an example in the remote island of Barra worthy of record. A specimen shot on the 24th of October last was submitted to me for determination by my friend Mr. W. L. Macgillivray, of Eoligary, Barra, who obtained the bird on the west side of the island. This species has not hitherto, I believe, been obtained in the Outer Hebrides. Mr. Macgillivray shot another Hebridean

rarity, a Garden Warbler (*Sylvia hortensis*), at the same time, so that, in all probability, a number of migrants, blown out of their course, visited the western islands about that time.

While writing on this subject, I should like to remark that the statements made regarding the Lesser Whitethroat as a Scottish summer bird are, in my opinion, highly unsatisfactory. It is undoubtedly a summer visitor to South-Western Scotland, but in *extremely limited numbers*. On the other hand, we have no satisfactory evidence whatever concerning it as a breeding bird in South-Eastern Scotland; though it probably occurs annually on the eastern seaboard as a bird of passage. Reliable data regarding this species as a Scottish bird would be welcomed for publication in the "Annals."—WM. EAGLE CLARKE, Edinburgh.

Great Gray Shrike in Solway.—For some years past *Lanius excubitor* seems to have been entirely absent in these counties. During the 80's more especially, it was an annual visitor in small numbers. In October last one was shot in the woods at St. Mary's Isle by one of the keepers there. It has been added to the many good local birds contained in the Kirkcudbright Museum.—ROBERT SERVICE, Maxwelltown.

Occurrence of the Black-bellied Dipper in Shetland.—On the 27th of November last, a Black-bellied, or Scandinavian race of Dipper, the *Cinclus melanogaster* of C. L. Brehm, was observed on the shores of Loch Spiggie, in the south of the main island of the Shetland group, and was shot the next day. There was a moderate gale from the north at the time, with frost and snow. Mr. T. E. Buckley informs me that this is the first known occurrence of the Dipper in the Shetland Islands. We had some Mealy Redpolls about the same time.—THOMAS HENDERSON, Junr., Dunrossness, Shetland.

Greater Spotted Woodpecker, Lochbroom, West Ross-shire.—The Greater Spotted Woodpecker (*Dendrocopus major*) was seen during December in the woods of Braemore, and has been observed daily to the 9th March, the day of writing. One was shot on Inverlael. They had never been seen before in this parish. I cannot say how many were seen, but probably not less than three or four.—J. A. FOWLER, Inverbroom.

Great Spotted Woodpecker in Kirkcudbright.—A fine specimen of the Great Spotted Woodpecker (*Dendrocopus major*) was procured last October on St. Mary's Isle, near Kirkcudbright, and is now added to the collection of birds in the Museum of that town.—ROBERT SERVICE, Maxwelltown.

Note on the Nesting Habits of the Cormorant.—Apropos of a discussion now going on in the pages of the "Zoologist," on the

subject of Moorhens covering their eggs when leaving their nests, I am reminded of a visit I paid, a few years ago, to a nesting colony of Cormorants (*Phalacrocorax carbo*), on a small island off the coast of Sutherland. On landing on the island, our party at once climbed to the rocky terrace above, and inspected the nests with a view to photographing them; they contained clutches of two, three, and in one instance five eggs. Having chosen the points of view for our pictures, we withdrew a short distance off. On returning to the nests with our cameras, in a quarter of an hour's time, great was our astonishment to find that the eggs were not to be seen, and on closer inspection, we discovered that they were concealed under pieces of seaweed, which the Cormorants had placed over them during our absence.—W. H. M. DUTHIE, Doune.

Occurrence of the King Eider in the Shetland Islands.—A beautiful specimen of the King Duck (*Somateria spectabilis*) was obtained by Mr. Eustace Bankart, of Melby House, Sandness, on Friday last week [24th February]. The last time a bird of this species occurred in Shetland was in 1846, and the following reference is made to it in Saxby's "Birds of Shetland," p. 252:—"The occurrence of this species in Orkney has doubtless led to the conclusion that it is also an occasional visitor to Shetland, and accordingly erroneous statements to that effect have been frequently repeated. Although constantly upon the watch for many years, I have never obtained a glimpse of it, nor can I meet with any person who has shot it, or even seen it. Thomas Edmondston, without giving either date or authority, says ('Zoologist,' 1844, p. 463), that it is 'sometimes seen.' Also in the 'Zoologist' for 1848, p. 2188, one is recorded by Mr. Dunn as occurring at Wensdale Voe, near Hoy, Shetland, on 20th May 1846, but this statement is scarcely sufficient. There is the well-known island called Hoy, in Orkney, and possibly a voe near it bears the above name, but though there is a *Weisdale* Voe in Shetland, there is neither a *Wensdale* Voe nor is there a Hoy. I am very doubtful, therefore, whether the King Duck has any right to a place in this work, but I allow it to remain for the present, being unwilling to remove it from the list simply upon my own responsibility, observing Shetland so often referred to by our best ornithologists as a locality." There can be no doubt that Dr. Saxby has been in error over this paragraph, as there is an island named Hoy situated in Weisdale Voe, as any one may see by consulting an Ordnance Survey map. The misspelling of Weisdale Voe probably led to this doubt on Dr. Saxby's part, but the most material reason that weighed with him was doubtless the extreme rareness of the bird in Shetland. Be that as it may, Mr. Bankart has for all time coming put the matter beyond question as to the King Duck deserving a place among "The Birds of Shetland." . . . The female bird was also caught at the same time along with the

male, and Mr. Bankart has had both specimens forwarded to London for preservation.—*Vide* "SHETLAND TIMES," 4th March 1899.

[We are informed that there is some doubt as to the identity of the female bird.—EDS.]

Water Rail and Frog.—In the stomach of a Water Rail caught on the Pentlands on 7th January, and brought to me, I was surprised to find a medium-sized Frog. This seems to indicate that the Frog had been on the move on that date, and not lying dormant at the bottom of a pool, as is usually the case in winter.—R. GODFREY, Edinburgh.

Lead-poisoning in Pheasants.—I had recently handed to me by a gamekeeper sixteen pellets which he had taken from the gizzard of a hen Pheasant. These had evidently been picked up by the bird while scraping among soil in search of food. The Pheasant was unable to fly any distance, and when it was put up it went off noiselessly, moving its wings after the manner of an owl. The pellets had evidently remained in the bird's gizzard for some time, for they were very much worn by the action of that organ. The keeper, who has large experience, tells me that he has on several occasions, in different parts of Scotland, picked up Pheasants that had died from the result of lead-poisoning through having picked up pellets in the manner here described.—BRUCE CAMPBELL, Edinburgh.

The Spotted Redshank on the Solway.—So far back as October of 1876 a friend of mine, Mr. Robert Douglas, who at that time resided near Gatehouse of Fleet, shot at the head of Fleet Bay what he always insisted was a Spotted Redshank (*Totanus fuscus*). I never saw the specimen, but as Mr. Douglas had a very good knowledge of birds there need be little difficulty in accepting the record. The bird in question was preserved as a mounted specimen, and was sent to England, and I lost trace of it. So far that was the only Spotted Redshank that has occurred on the Scottish side of the Solway that I am aware of, although every now and again a lively imagination would seem to hear, from amongst the hosts of waders that frequent the banks in the neighbourhood of Southerness, the echoes of its peculiar call. But an individual about which there is no doubt has now turned up. About the New Year Mr. Robert M'Call of Carsethorn noticed a peculiar Redshank amongst the others. It nearly always forgathered with the Common Redshanks, but was markedly different in flight and voice. Shy and wild, it could not be approached within gunshot, and long shots were tried without success. At last, at the mouth of the Kirkbean Row, on 13th February, Mr. M'Call stalked it by crawling up a "runner," and was successful in bringing it down. Next day I saw it, and confirmed its identification. Mr. M'Call has preserved

it, and it makes a most interesting addition to his little collection of birds of his own shooting and mounting. The body was sent to me for dissection, when the bird proved to be a female. The plumage still shows a few traces of immaturity, so that the bird is probably a young female of last year.—ROBERT SERVICE, Maxwelltown.

Whimbrel in the Firth of Forth in Winter.—The Whimbrel (*Numenius phaeopus*) is so seldom met with in this district, except on passage in spring and autumn, that I send you the dates of two occurrences I have noted recently. The bird first observed was at Longniddry Bay on 11th February; the other was seen at the mouth of the Tyne on the 16th of the same month. I am unaware of any previous records of this bird's presence in the Firth of Forth and its vicinity in the winter months.—T. G. LAIDLAW, Edinburgh.

The Food of the Brown-headed Gull.—The question as to whether the Brown-headed Gull (*Larus ridibundus*) consumes the fry of Salmonidæ in large numbers has lately agitated the County Council of Cumberland. Perhaps some readers of the "Annals" may be in a position to speak positively as to the truth of the suggestion that this Gull is ichthyophagous. In my own experience, the evidence points to this bird being largely insectivorous. In the spring of the year, the Brown-headed Gulls swarm upon freshly ploughed land in this neighbourhood. They are then feeding chiefly on grubs and earthworms, but corn is sometimes swallowed, particularly barley. As the season advances, beetles of different kinds are eagerly sought for, and are supplied to the young along with earthworms. When the young are fledged, many of them join the adults upon the sandy flats of our estuaries, where they feed on small mussel shell and other bivalves, as well as any stray animal substances, of small bulk, that may be washed up on the beach. I have never seen this Gull feeding on carrion, though it will devour most kinds of refuse. The Herring Gull will occasionally tear at the carcase of a dead dog as eagerly as a Great Black-backed Gull. But the Brown-headed Gull is more fastidious. Perhaps winged insects are most to its taste, particularly certain moths, species of Noctuæ, for which it hawks over the hay-fields with grace and beauty. But on the sands this Gull follows flocks of Waders, particularly of Bar-tailed Godwits (*Limosa lapponica*). When a Godwit catches a marine worm, the attendant Gull darts at its neighbour, and endeavours to compel the long-billed bird to drop its prey. If this manœuvre proves successful, the Gull bolts the wriggling worm before it has time to burrow in the wet sand. I am told that the Brown-headed Gull often feeds upon sand-eels, but though I have watched individual Gulls for hours at a stretch, I cannot say that I have ever seen them capture any little fishes. I

do not, in the least, question the accuracy of those who maintain that this Gull diets itself on young fry—*when* it can get them; *Larus fuscus* is far from guiltless in that respect, but I believe that even this rapacious bird prefers a small crab or the entrails of any animal to small fish. The habits of most birds vary in different districts. In some parts of the country the Rook (*Corvus frugilegus*) is asserted to do more good than injury to the farmers. In my present neighbourhood, it frequently taxes a farmer to the extent of £20 in a season, by the havoc which it wreaks upon his turnip crop. Another misdeed of the Rook is that it attacks stacks of grain, and not only draws out quantities of corn for its own consumption, but also allows rain to enter the stack through the holes which it has driven in the top of the stack. It is easy to understand that the Brown-headed Gull may damage the interests of anglers in *certain* districts; especially in situations in which insect life is scantily represented.—H. A. MACPHERSON, Allonby.

Iceland Gull near the Solway Firth.—On the 10th of February 1899, a stormy day with strong westerly winds, my friend Mr. R. Mann was driving along the coast near Maryport, when he observed a single Iceland Gull flying over a meadow near the sea. He stopped his horse and watched the bird very closely. It was in creamy immature dress, and conspicuous among the Herring Gulls to which it had joined company. Another specimen of this Arctic Gull was shot in a field about two miles from Carlisle, on the 28th of February 1898. I did not see the bird in question until a day or two later, when it was already mounted; it was a white bird, mottled with pale brown, but much lighter in coloration than a bird of the first year. I had not the good fortune to secure this bird for the Carlisle Museum, as it belonged to a keen local collector. The Carlisle Museum contains only a single *Lakeland* specimen of this *Larus*, and that is immature. I cannot say that either the present species or *Larus glaucus* occur with any frequency on the coast of the Solway Firth. I live with a telescope in my window and a field-glass in my hand; but some years have elapsed since I last had the privilege of identifying any of our rarer Gulls in life.—H. A. MACPHERSON, Allonby, Cumberland.

Note on the Moulting of the Flight Feathers in the Divers.—I believe it has been hitherto unrecorded that any of the Divers (*Colymbus*) moult the flight feathers *en masse*, thus losing all power of flight for the time. It is, of course, well known as regards the Ducks, and has been recorded of sundry other birds—Moorhen and Land Rail, for instance. At the end of September and beginning of October 1898 I had, at intervals, several Red-throated Divers (*C. septentrionalis*) sent in. The adults were in all stages of the "moult"; the majority being entirely devoid of flight

feathers, both primaries and secondaries having been shed. This shedding of the flight feathers would appear to take place at a fairly advanced stage of the general moult, as in most specimens without these feathers the red and gray plumage of the neck had nearly all disappeared, and the new feathers were appearing on the back.—WILLIAM FARREN, Cambridge.

Occurrence of the Loggerhead Turtle in North Uist.—On 26th November last a young example of the Loggerhead Turtle (*Thalasseochelys caretta*) was washed up on a sandy beach on the island of Vallay, North Uist. It was apparently only just dead, and the carapace was $6\frac{1}{4}$ inches long and $5\frac{3}{4}$ inches broad, both measurements being taken along the curve. I have been told that large specimens have frequently been washed up in the vicinity, but no one has recorded the fact, and I much doubt the accuracy of the statement.—C. V. A. PEEL, Oxford.

[In Scotland this sub-tropical species has only, to our knowledge, been recorded for Pennan, on the coast of North Aberdeenshire, in August 1861.—EDS.]

Chrysomela hæmoptera, L., in Ayrshire.—In going over a small collection of Coleoptera belonging to Mr. William Gilmour of Greensland Farm, Stewarton, I came across a specimen of this species. Mr. Gilmour informs me that he found it crawling on grass near his farm last summer. *Chrysomela hæmoptera* is an addition to the Clyde list. It has only been recorded for "Forth" by Dr. Sharp in his catalogue of the Coleoptera of Scotland.—ANDERSON FERGUSSON, Glasgow.

Enallagma cyathigerum in Shetland.—This common British dragon-fly I found in 1896 and 1897 in some abundance about the moorland lochs of North Delting and the peat-holes of Gluss Isle, in Shetland. I am indebted to Mr. W. J. Lucas for the identification, and send this note with a view to help in working out the distribution of the species.—R. GODFREY, Edinburgh.

Notes on some Crustacea from Granton, Firth of Forth, obtained from a Ship's Hull.—About a year ago, Captain Campbell (of the Fishery Board for Scotland) brought to me some scrapings from a ship which had been brought into the harbour at Granton to be cleaned of the barnacles and weed adhering to it. The ship, which was called the "Echo," had arrived some time previously from the Cape of Good Hope. The species of Crustacea obtained amongst the scrapings brought to me comprised two Cirripeds, two Copepods, one Isopod, and three Amphipods, all of which appeared to have been recently alive.

The Cirripeds belong to the two well-known forms *Lepas anatifera* (Linn.) and *Balanus tintinnabulum* (Linn.), both of which

have already been mentioned in published catalogues of the marine fauna of the Firth of Forth. These two species of Cirripeds, though widely distributed, and from time to time brought to our shores adhering to ships' sides, as well as by floating wreckage, etc., are scarcely entitled to rank as members of our fauna.

The Copepods are *Harpacticus*, sp., and *Idya minor*, T. and A. Scott. The *Harpacticus* resembles a form described by me from the Firth of Forth under the name of *Harpacticus obscurus*. *Idya minor* has been obtained in the Clyde, but I do not know of any previous record of it from the Forth estuary.

The single species of the Isopoda observed belongs to *Næsa*, and agrees generally with *Næsa bidentata* (Adams). The only specimen observed was a male, the sixth segment of the peræon being produced backwards into a bidentate process. This species has been recorded from the Clyde by the late Dr. Robertson of Millport, but it does not appear to have been obtained in the Forth. *Næsa* is sometimes found inside the shells of dead *Balani*, and in such circumstances may easily escape notice. This Isopod appears to vary considerably in form, either from age or sexually. The Rev. T. R. R. Stebbing, in his "History of Recent Crustacea," says it "seems not improbable that the species named *Dynamene rubra* and *Dynamene viridis* by Leach, and *Campecepea versicolor* by Rathke, may represent the female, and *Dynamene Montagu* the young male, of *Næsa bidentata*."

The Amphipoda comprise *Stenothoe* (?) *monoculodes* (Mont.), *Podocerus falcatus* (Mont.), and *Caprella equilibra*, Say. The *Stenothoe* appears to agree perfectly with the species named, except that the telson has two or three small spines on each side near the margin, as in *Stenothoe marina*; usually the telson of *Stenothoe monoculodes* is unarmed. *Podocerus falcatus* was represented by both males and females; a few of the males had the gnathopods fully developed, but the greater part of them were more or less immature. Both this species and *Stenothoe monoculodes* have already been recorded from the Firth of Forth. The *Caprella equilibra*, though a member of the British fauna, has not hitherto been recorded from either the Firth of Forth or the Firth of Clyde. Most of the specimens obtained were immature, and differed considerably from the typical mature form; this difference was specially noticeable in the immature males, which had the cephalosome and first free body segment much shorter than in a full-grown specimen. The difference was so great in this respect, that had one or two mature males not turned up, I should have hesitated to ascribe the specimens to *C. equilibra*.

The occurrence of these Crustaceans under the circumstances described is of interest from its bearing on the dispersion of species, and as an example of one of the various means by which forms

hitherto unrepresented in our faunas, local and otherwise, may be introduced; and may, if the habitat happens to be favourable, become permanently resident where they were before quite unknown.—THOMAS SCOTT, Leith.

Vertigo pygmæa and other Molluses in "Perth E."—Seeing *Vertigo pygmæa* is not recorded for the "vice-county" of "Perth E." in Mr. Roebuck's "Census" of Scottish Land and Fresh Water Mollusca, I may mention that in September 1898, while staying at Fenderbridge near the foot of Glen Tilt, I obtained a specimen off grass by the side of Loch Moraig. It has been submitted to Mr. J. W. Taylor, F.L.S., for authentication. The following shells, all of which, except the *Pisidium*, have, however, already been authenticated from the vice-county, were also collected in the neighbourhood of Fenderbridge, namely:—*Vitrina pellucida*, *Hyalina alliaria*, *H. nitidula*, *H. radiatula*, *H. pura*, *H. crystallina*, *H. fulva*, *Helix rotundata*, *H. pygmæa*, *H. hortensis*, *H. arbustorum*, *H. hispida*, *Vertigo edentula*, *Clausilia bidentata*, *Cochlicopa lubrica*, *Succinea elegans*, *S. putris*, *Carychium minimum*, *Limnæa peregra*, *L. truncatula*, and *Pisidium pusillum*. The small brown slug *Agriolimax lævis* was frequently seen, as were also *A. agrestis*, *Limax marginatus*, *Arion ater*, *A. subfuscus*, *A. minimus*, *A. circumscriptus*, and *A. hortensis*. By mistake, Glen Tilt, as a locality for the last-named slug, is entered in the "Census" under "Perth Mid" instead of "Perth E.," or "Perth N." as it is there called. In a paper on the 'Fauna and Flora of Glen Tilt' contributed a number of years ago to the "Scottish Naturalist" (vol. iv. p. 247), the late Dr. Buchanan White drew attention to the great abundance in which *Helix arbustorum* occurs on the hill side opposite Forest Lodge.—WILLIAM EVANS, Edinburgh.

Monomorium pharaonis and Blatta germanica as pests in an Edinburgh Hotel.—About two years ago I was informed that a small insect had appeared in great numbers in a hotel in Edinburgh. A request for specimens resulted in the production of some dozens of the small ant *Monomorium pharaonis*, a species which Mr. E. Saunders, F.L.S., who has kindly confirmed my identification, tells me is "very common in many of the London eating-houses, etc." It is not indigenous to this country.

Along with the ants there were also sent a number of specimens of the small cockroach *Blatta germanica*, from the same hotel. The occurrence of this insect in a newspaper office in Glasgow in 1880 was recorded by Professor Trail in the "Scottish Naturalist" (vol. vi. p. 14).—WILLIAM EVANS, Edinburgh.

BOTANICAL NOTES AND NEWS.

Rosa involuta, Sm., in Forfarshire.—In July last, whilst staying at Carnoustie, I fell in with rather a remarkable colony of *R. involuta*. It consists of eleven distinct clumps scattered at intervals over a distance of more than half a mile. Three of them occur at a short distance from Muirdrum, by the side of a cross road which branches off from the road to Carnoustie. The others grow here and there on the bank of a small stream which crosses the main road a little farther on, and which winds through the bottom of a den with high and often steep banks. Some of these clumps are rather extensive. One stretches along the top of a bank for a distance of about 25 yards, interrupted, however, by a couple of young trees, and with some other bushes intermixed. Others stretch over a length of 15 to 30 feet. I shall reserve for another occasion a detailed description of their resemblances and differences, as well as the discussion of that question which Professor Crépin has recommended to British botanists, viz. whether the second parent be *R. tomentosa* or *R. mollis*. This is generally a difficult problem, at least in Scotland, where, in most districts, *R. mollis* is at least as plentiful as *R. tomentosa*. In this case, it is peculiarly difficult owing to circumstances which I need not now detail. In fact, I have as yet been unable to come to any definite opinion, except in the case of one clump which I believe to be *R. pimpinellifolia* × *tomentosa*. The others, which are different in several respects, require further study.

Can any of your Forfarshire readers give any information as to the distribution of *R. involuta* in their county. Don found it, according to Baker, on a rock on one of the mountains of Clova, near the limits of perpetual snow! In Gardiner's Flora it is said to be common in the Highland valleys of the county, but I do not know what ground he had for this statement. In those districts where *R. pimpinellifolia* occurs, it should be looked for.—W. BARCLAY.

R. hibernica in Midlothian.—In Professor Crépin's "Rosæ Hybridæ," page 146, he refers to specimens of *R. hibernica* gathered by Gorrie in 1866, between Melville Hall and Bellyford Burn, and which are now in the Herbarium at the Edinburgh Botanic Gardens. Gorrie's plant, like *R. hibernica* of the North of Ireland, has the leaves pubescent below, and, so far as I know, it is the only bush of this variety of *R. hibernica* which has yet been found in Scotland. Wishing to study the plant if it was still to be found, I visited the locality in the end of August 1895. I failed to find it, but was not surprised at that, as all the bushes on one side of the road had, a short time before, been cut close to the ground. As the roots were left, however, I felt certain that the plant, if still there, would come up

again. In September of last year, on again visiting the locality, I had no difficulty in finding what I sought. Many and vigorous shoots of what was plainly Gorrie's plant were growing to a height of three or four feet. The bush had not flowered since the cutting down, but it will probably do so next year. The Edinburgh botanists might look after it and try to prevent its being destroyed. As I have already said, I believe it to be as yet unique in Scotland. I may add that at a distance of about 100 yards I found a bush of *R. involuta* which had also been cropped, and was recovering. It had flowered, as I found on it the remains of several abortive fruits.—W. BARCLAY.

Atriplex calotheca, Fries ("Nov. Fl. Suec. Mant.," 3, p. 164, 1842).

A. hastata, var. *calotheca*, Rafn., "Danm. Fl.," p. 240, teste Fries, l.c.—I was very pleased to see Mr. Druce's report of *A. calotheca*, Fr., in Wigtown, in the last number of the "Annals." For some time I have expected this would occur as a Scottish plant, and I have several Scottish specimens that are probably it; but they are all too immature to be sure of. If found in good fruit, there is no difficulty in separating this from the other British forms; but it is not so easy to separate the Scandinavian ones placed under it. In Hartman's "Handbook" (p. 350, 1879) it is separated into four forms: viz. α , *geminata* ("Fl. Danica," t. 1608); β , *stipitata* (Westerl.); γ , *longipes* (Drejer), "Fl. Danica," t. 2714, and δ , *parviflora*, Lange. Lange ("Danske Flora") makes *calotheca* into three varieties and one subspecies with a variety. Westerlund, in 1861, published a critical account of the Swedish species, entitled "Bidrag till kännedomen af Sveriges Atriplices." The possible stations for *calotheca* in Scotland are: E. Sutherland, Rev. E. S. Marshall!; E. Ross, Rev. E. S. Marshall!; Wigtown, J. M'Andrew. A remarkable variety of *A. littoralis*, L., simulating the var. *longipes* of *calotheca*, I have from Abercorn, Linlithgow, Dr. Playfair—ARTHUR BENNETT.

Scottish Forms of Juncus.—Among several Junci that I lately submitted to Dr. Buchenau were several from Scotland of interest, if only from the queries they may suggest. To small specimens of *J. lamprocarpus* from Islay (V.C. 102), gathered by Dr. Gilmour, he adds: "Ad var. *littoralem* accedens"; to another from the same island: "*J. alpinus* \times *lamprocarpus*? differt a *J. lamprocarpo* sepalis obtusioribus." Specimens from Orkney (coll. J. Boswell Syme, com. F. J. Hanbury) are marked by him: "*J. anceps* \times *lamprocarpus*, vel *J. alpinus* \times *lamprocarpus*? is perhaps a hybrid plant which has become gradually fruitful. This would have to be proved on the spot." So far *J. alpinus* has not been recorded for the Orkneys; but it is very likely to occur—more so, one would think, than *J. anceps* (although Dr. Buchenau writes: "*J. anceps* \times *lamprocarpus* is now known to me from Borkum also"). Out of the 23 North Sea

islands (of which Borkum is one), *J. alpinus*, Vill., is recorded from 15 (L. Vuyck, "De Plantengroei der Dunen," 1898). *J. anceps*, De la Harpe ('Ess. mon. vraies Joncées' in "Mem. Soc. Nat.," Paris, iv. 126, 1825), has a restricted distribution, and would seem more likely to occur on the coasts of Eastern England than Scotland. *J. alpinus*, Vill.; *J. anceps*, De la Harpe; *J. atricapillus*, Drejer; and *J. Requienui*, Parl., are closely allied, and often difficult to separate. Dr. Buchenau makes *J. atricapillus*, Drejer ("Bid. t. d. Flora," Kröyers Tidss., 2, p. 182, 1838), a variety of *anceps* (in "Krit. Zus. der europæischen Juncaceen," 1885). This occurs in Norway, Sweden, Denmark, and Saxony. Specimens from "Ardneil Bay, W. Kilbride, Ayrshire, 7.7.96, A. Somerville, growing in damp sea-shore sand," are doubtfully named by Dr. Buchenau *J. anceps* × *lamprocarpus*, vel *alpinus* × *lamprocarpus*??; forma *rara radicans*." Similar specimens to those from Orkney, from the Outer Hebrides, are named in the same way by Dr. Buchenau, and he remarks on them: "In the Hebrides there probably occurs a form of *anceps* as well as *lamprocarpus*." It would seem that, looking at the forms and distribution of *anceps*, the var. *atricapillus* (of Drejer) would be the most likely to occur in Scotland, one of its stations being "in dunetis maritimis a Hallandia (Suec.)," Buchenau, *l.c.*—ARTHUR BENNETT.

Orehis cruenta, Müller, in Britain.—Mr. Herbert Goss records in the "Journal of Botany" (January 1899, p. 37) that he found this plant last summer, moderately common, in two or three bogs on the fells of Cumberland, at about 1000 feet above the sea-level. Regarding it at the time as a very stunted form of *O. latifolia*, he took only about a dozen examples. The plant has a pretty wide distribution in Scandinavia, especially in bogs at from 1000 to 1600 feet above the sea-level in the north. It should be looked for in Scotland. In Blytt's "Norges Flora" (pp. 341, 342), it is said to closely resemble *O. incarnata*, and especially *O. latifolia*, var. *brevifolia*, Rchb., from which it differs chiefly in the very dark purple spots of the leaf, the rather smaller and darker red flowers, the square undivided lip, and the very short slightly curved spur.

New Varieties of Scotch Carices.—I again visited Ben Lawers in last July and August in order to see *Carex helvola*, and found that owing to the protracted drought it had somewhat suffered; but specimens which I collected were submitted to the Ffarrer Kükenthal, and he again corroborated the name of *C. helvola*, and he still considers the plant to be a hybrid of *C. approximata* (*lagopina*) and *canescens* (*curta*). With it I gathered a somewhat interesting form of *Carex flava* which I also found on Ben Heasgarnich and Ben Laoigh, which the Ffarrer Kükenthal identifies with *C. flava*, var. *pygmæa*, Andersson. This is described by Andersson in the "Cyperaceæ Scandinaviæ" of 1849, p. 25, as "culmo unciali-

digitali foliis multo breviori, spicis parvis subrotundatis confertis." On Ben Heasgarnich, on a shoulder of the mountain near the summit, my companion for the day, Mr. H. N. Dixon, the well-known bryologist, found a form of *Carex canescens* which had much of the appearance of *C. helvola*, but on dissection proved to be distinct. This the Ffarrer Kükenthal names *C. canescens*, var. *dubia*, Bailey. I may mention that the interesting *Carex atrofusca (ustulata)* was rather frequent over a limited area of Ben Heasgarnich, choosing for its habitat the edge of some sloping rock-shelf which is kept moist with dripping water. I think the two varieties mentioned above are new to the Scottish flora.—G. CLARIDGE DRUCE.

Botanical Exchange Club of the British Islands—Report for 1897, by G. Claridge Druce M.A., F.L.S. (issued 20th Sept. 1898).—As usual, there are numerous notes on plants from Scotland in this Report. With regard to a good many of these, diverse opinions are expressed by the senders and the referees, but the subjoined extracts embody the more important conclusions arrived at:—

R. acris, L., var. *tomophyllus* (Jord.), Melvich, N. coast of Sutherland (108); *Fumaria Boræi*, Jord., near Dunblane (97); *Draba incana*, L., var. *legitima*, Lindblom (fruits glabrous), at Ardnane Point, Islay (102); *Sisymbrium officinale*, L., var. *leiocarpum* (Jord.), DC., Ullapool, W. Ross (105); *Polygala oxyptera*, Reichb., var. *collina*, Reichb., near Tain, E. Ross (106); *Hypericum pulchrum*, L., var. *procumbens*, Rostrup, Holburn Head, Caithness (109); *Rubus villi-caulis*, W. and N., var. *Selmeri* (Lindb.), Claddach (99); *R. echinatus*, Lindb., Shandon (99); *Atriplex calotheca*, Fries? is the name assigned by Herr Freyn to a plant gathered by Rev. E. S. Marshall at Golspie (107), the specimens not warranting certainty; *A. Babingtonii*, Woods, var. *virescens*, Lange, Golspie (107), E. S. Marshall; *Betula pubescens*, var. *parviflora*, Wimm., near Tongue (108), W. A. Shoobred; *Carex approximata*, Hoppe (= *C. lagopina*, Wahl.), Corrie Sneachda (96), G. C. Druce; *C. aquatilis*, Wahl., var. *elatiior*, Bab., Altnaharra (108), W. A. Shoobred; *Equisetum sylvaticum*, L., var. *capillare* (Hoffm.), Dunphail (95), E. S. Marshall.

Andromeda polifolia, L., in Midlothian.—On 8th May 1895 I found the Wild Rosemary, *Andromeda polifolia*, in flower on Auchencorth Moss, Midlothian. I noticed only a single plant, which I gathered. I cannot find any previous record for the species in Midlothian, and am indebted to Mr. Wm. Evans for the following note on the plant's occurrence in 'Forth':—"Thanks for the specimen of *Andromeda polifolia*, the occurrence of which on Auchencorth Moss is most interesting. So far as I know, this plant has not previously been found nearer Edinburgh than the neighbourhood of Stirling in the upper section of 'Forth.' Light-foot recorded it fully a century ago from Blair-Drummond Moss on

the authority of Mr. Yalden ('Flora Scotica,' vol. ii. p. 1123), and Graham, in his 'Sketches of Perthshire' (2nd ed., 1812, p. 211), mentioned it as then plentiful on Flanders Moss. I have a note of its presence in the former of these localities down to 1882, and Mr. R. Kidston tells me it still grows in Flanders Moss, and also on a moss near Old Polmaise, a few miles on this side of Stirling."—ROBERT GODFREY, Edinburgh.

CURRENT LITERATURE.

The Titles and Purport of Papers and Notes relating to Scottish Natural History which have appeared during the Quarter—January-March 1899.

[The Editors desire assistance to enable them to make this Section as complete as possible. Contributions on the lines indicated will be most acceptable and will bear the initials of the Contributor. The Editors will have access to the sources of information undermentioned.]

ZOOLOGY.

REPORT ON A VISIT TO SANDA AND GLUNIMORE. By John Paterson and John Renwick. *Trans. Glasg. Nat. Hist. Soc.*, vol. v. pt. ii. (1897-98), pp. 197-204.—Notes on the Fauna, Flora, and Geology.

THE SUMMER BIRDS OF THE SUMMER ISLANDS. By J. B. Dobbie, F.R.S.E., F.Z.S., M.B.O.U. *Proc. Roy. Phys. Soc. Edin.*, vol. xiv. pt. i. pp. 46-57 (1897-98).—A list of thirty-five species.

NOTES ON SHETLAND BIRDS. By F. S. Graves and P. Ralf. *Zoologist* (1899), pp. 72-77.

RARER BIRDS OF THE SHETLANDS. R. Kearton. *The Field*, 7th January 1899, p. 2.

THE RED-NECKED PHALAROPE IN SHETLAND. Thomas Edmonston. *The Field*, 28th January 1899, p. 134.

GREAT NORTHERN DIVER IN ARGYLLSHIRE. F. W. Frohawk. *The Field*, 28th January 1899, p. 134.—The supposed breeding of this species in Argyll disproved.

TAY LAND-LOCKED SALMON. D. T. Steil. *The Field*, 2nd February 1899, p. 146.—Several thousand "American land-locked Salmon" were introduced "some years ago" into Loch Tay by the Marquess of Breadalbane.

ON THELODUS PAGEI, POWRIE, SP., FROM THE OLD RED SANDSTONE OF FORFARSHIRE. By Ramsay H. Traquair, M.D., LL.D., F.R.S. *Trans. Roy. Soc. Edin.*, vol. xxxix. pt. iii. No. 21, pp. 595-602, plate.—The object of this paper is to show that the "*Cephalopterus*" *Pagei* of Powrie belongs to the genus *Thelodus* of Agassiz, a genus hitherto known only by scattered scales in the Upper Silurian

of England and Russia, and also in the Upper Devonian of the latter country. This recognition of its affinities throws a new light on the family Cœlolepidæ, to which *Thelodus* belongs, and shows that, though related to the Elasmobranchii, they were not *Cestracion*-like sharks, and that the spines from Silurian and Lower Devonian rocks known as *Onchus* did not belong to them.

ON A NEW SPECIES OF CEPHALASPIS DISCOVERED BY THE GEOLOGICAL SURVEY OF SCOTLAND IN THE OLD RED SANDSTONE OF OBAN. By Ramsay H. Traquair, M.D., LL.D., F.R.S. *Trans. Roy. Soc. Edin.*, vol. xxxix. pt. iii. No. 20, pp. 591-593, plate.—The species is named *C. Lornensis*; and the specimens were collected in the Lower Old Red in the neighbourhood of Oban. It has also been found in the island of Kerrera.

NOTES ON THE MICRO-FAUNA OF AILSA CRAIG, FIRTH OF CLYDE. By Thomas Scott, F.L.S. *Trans. Glasg. Nat. Hist. Soc.*, vol. v. pt. ii. (1897-98), pp. 153-158.—Treats of the Mollusca, Crustacea, and Insecta.

OCCURRENCE OF SIREX GIGAS, LINN., IN ARRAN AND BUTE. By J. Ballantine. *Trans. Glasg. Nat. Hist. Soc.*, vol. v. pt. ii. (1897-98), pp. 187-189.

ENTOMOLOGICAL NOTES FROM GLEN LOCHAY AND LOCH TAY, INCLUDING RECORD OF AN OXYETHIRA NEW TO BRITAIN. By Kenneth J. Morton, F.E.S.—*Ent. Mo. Mag.* (2), vol. x. pp. 53-55 (March 1899).—Twenty species of Lepidoptera, Neuroptera, and Trichoptera are noted as observed or captured during July 1898. The new species is *Oxyethira simplex*, Ris.

THE LEPIDOPTERA OF OBAN AND DISTRICT. By W. G. Sheldon. *Ent. Record*, vol. xi. pp. 13-14 (January 1899).—Notes on thirty-one species captured in July 1898.

CIDARIA RUSSATA SINGLE-BROODED IN SCOTLAND. W. G. Sheldon. *Ent. Record*, vol. xi. pp. 55, 56 (February 1899).—From observations made upon specimens captured near Oban, it seems doubtful if either this species or *C. immanata* have more than one brood in Scotland.

TWO SPECIES OF EPHEMERIDÆ NEW TO BRITAIN. By C. A. Briggs, F.E.S. *Ent. Mo. Mag.* (2), vol. x. pp. 68, 69 (March 1899).—*Leptophlebia meyeri*, Etn., taken in June 1898 above the Black Wood near the lochan called Rusg-a-Bhiora, near Loch Rannoch; *Ameletus inopinatus*, Etn., taken on 8th June 1898 from a bush on the shore of Loch Rannoch.

ON THE BRITISH SPECIES OF THE DIPTEROUS GENUS LOXOCERA, MG. (FAM. PSILIDÆ) WITH THE DESCRIPTION OF A NEW VARIETY. By Ernest E. Austen. *Ent. Mo. Mag.* (2), vol. x. pp. 65-68 (March 1899).—The new variety is named *Loxocera aristata*, var. *Yerburyi*. It was obtained at Kingussie (three examples) and Nethy Bridge (two examples), Inverness-shire, by Colonel Yerbury, in July and

August 1898. A table is given for the determination of the British species of this genus, and the following Scottish specimens in the British Museum collections are referred to:—*L. aristata*, Pz., from Loch Rannoch, Perthshire, and Nethy Bridge, Inverness-shire.

NOTES ON THE TIPULIDÆ OF THE GLASGOW DISTRICT. By George W. Ord. *Trans. Glasg. Nat. Hist. Soc.*, vol. v. pt. ii. (1897-98), pp. 190-196.—Includes about 50 species.

ON THE BRITISH PANDALIDÆ. By W. T. Calman, B.Sc. *Ann. and Mag. Nat. Hist.* (7), vol. iii. pp. 27-39, plates i-iv.—Reference made to Scottish species.

BRITISH LAND ISOPODA. By Canon A. M. Norman, M.A., F.R.S., etc. *Ann. and Mag. Nat. Hist.* (7), vol. iii. pp. 70-78, plate vi.—Reference is made to Scottish species.

ON SOME NEW MYRIAPODS FROM THE PALÆOZOIC ROCKS OF SCOTLAND. By B. N. Peach, A.R.S.M., F.R.S. *Proc. Roy. Phys. Soc. Edin.*, vol. xiv. pt. i. pp. 113-126, plate iv. (1897-98).—A description of new genera and species from the Lower Carboniferous rocks of East Kilbride, and of Lennel Braes, Coldstream, Berwickshire; from the Lower Old Red of Kerrera, near Oban; and the Ludlow Beds of Lesmahagow, Lanarkshire.

BOTANY.

BIOGRAPHICAL INDEX OF BRITISH AND IRISH BOTANISTS—FIRST SUPPLEMENT (1893-97). By James Britten, F.L.S., and G. S. Boulger, F.L.S. *Journ. Bot.*, 1899, pp. 77-84.—From Rev. Andrew Robertson (1780-1845) to William Young. Scotch botanists included in this instalment are:—Rev. Andrew Robertson, David Robertson of Cumbræ, John Rotherham (died in 1804 at St. Andrews, where he had been a professor), John Roy, LL.D., John Sim, William Alex. Stables of Cawdor, George William Traill, Francis Buchanan White, M.D., Rev. Alexander Williamson, Alexander Stephen Wilson.

CERASTIUM ARCTICUM, LANGE. By E. S. Marshall. *Journ. Bot.*, 1899, p. 38.—Upholds that in Britain there is a species distinct from *C. alpinum*.

RUBUS BAKERI, F. A. LEES. By C. E. Salmon. *Journ. Bot.*, 1899, p. 39.—Records this, identified by Rev. W. Moyle Rogers, from Cantire and Argyll. It had not been recorded from Scotland.

CHENOPODIUM CAPITATUM, ASCHERS. (= BLITUM VIRGATUM, L.). By J. C. Melvill. *Journ. Bot.*, 1899, p. 85.—Mentions this plant as gathered by Dr. Boswell Syme at Fisherrow, near Edinburgh.

CLASMATOCOLEA CUNEIFOLIA (HOOK.), SPRUCE, IN SCOTLAND. By W. H. Pearson. *Journ. Bot.*, 1899, p. 38.—Records this Hepatic new to Scotland from Moidart, collected by Mr. S. M. Macvicar.

PLANTS OF NOVAYA ZEMLYA—*continued.* *Journ. Bot.*, pp. 468-474.

CERASTIUM ARCTICUM, LANGE. By F. N. Williams. *Journ. Bot.*, p. 493.—Is a reply to Mr. Marshall's note on p. 38, adhering to the view that *C. arcticum* is not a distinct species.

JUNGERMANIA OBTUSA, LINDE., IN BRITAIN. By W. H. Pearson. *Journ. Bot.*, p. 493.—Records another addition to British Liverworts, by Mr. S. Macvicar, from West Inverness.

TRANSACTIONS OF THE P.S.N.S. Vol. ii. part 6 contains:—*Preliminary List of Perthshire Mosses*, by R. H. Meldrum. *Plant Associations of the Tay Basin*, by R. Smith. *The Geological Factors in the Distribution of the Alpine Plants of Perthshire*, by P. M'Nair.

EXCURSION OF THE SCOTTISH ALPINE BOTANICAL CLUB TO KILLIN IN 1897. By William Craig, M.D., F.R.S.E. *Trans. Edin. Bot. Soc.*, December 1897, xxi. pp. 104-109.—Many of the alpine plants of the Breadalbane hills were gathered, but no novelties are recorded.

ASTRAGALUS ALPINUS, ALBUS. By Robert Lindsay. *Trans. Edin. Bot. Soc.*, December 1897, xxi. p. 117.—Records occurrence of *white* flowers on plants brought in June 1896 from Ben Vrackie.

MEASUREMENT OF THE GIRTH OF CONIFEROUS TREES AT BRAEMAR IN 1894. By R. Turnbull, B.Sc., and Percival C. Waite. *Trans. Edin. Bot. Soc.*, December 1897, xxi. pp. 87-94, with plate of curves.—This paper gives measurements of radii, diameters, and girths of trees blown down in November 1893.

THE DIAMETER-INCREMENT OF THE WOOD OF CONIFEROUS TREES AT BRAEMAR IN RELATION TO CLIMATIC CONDITIONS. By R. Turnbull, B.Sc. *Trans. Edin. Bot. Soc.*, December 1897, xxi. pp. 94-104, with plate.

APODYA LACTEA, CORNU (LEPTOMITUS LACTEUS, AGARDH.). Described by R. Turnbull, B.Sc. *Trans. Edin. Bot. Soc.*, December 1897, xxi. pp. 109-113, with plate.—From streams flowing into the Spey. The relation of the fungus to organic impurities in water is discussed.

REVIEWS.

THE CAMBRIDGE NATURAL HISTORY. BIRDS. By A. H. Evans, M.A. (London: Macmillan and Co., Ltd., 1899.)

Mr. Evans's welcome volume forms the ninth of "The Cambridge Natural History," and is the fourth issued of that admirable series.

The author has evidently realised the fact that other recently published works—more especially Professor Newton's masterly

“Dictionary”—have contributed largely to our knowledge of ornithology generally, and this has led him to treat “Birds” from the standpoint of the Systematist, devoting only a few pages—perhaps some may consider too few—to structure and general introductory matter.

There can be no doubt that such a book was a desideratum. Here we have, compressed into a single handy volume, a really honest attempt to give, so far as is possible, an adequate account of each family of birds, treating all alike. The scrupulous and painstaking care bestowed upon this volume has resulted in its affording a marvellous amount of information of a varied nature, and in the highest standard of accuracy being maintained. Thus has the attempt alluded to been converted into a success.

The secret of the excellence attained by Mr. Evans lies in the fact that his book took *years* to prepare, and was not dashed off in a few weeks, as, alas ! too many books are nowadays.

We have only one regret to express in connection with the book, namely, that our author has not thought well to recognise the very generally accepted view that the Corvidæ are the most specialised family of the Passeriformes, and should be placed at the head of that order, and hence of the class Birds. The Crows are here deposed in favour of the Finches. The great objection to this departure from the views of the majority is that it leads to a state of unrest, which it is most desirable should be avoided ; unless, indeed, there are important and valid reasons for such departure, which, in this case, have certainly not been demonstrated.†

The book abounds in excellent original illustrations from the pencil of Mr. Lodge, and a few others which are old friends, while a useful map forms a frontispiece.

We have no doubt that Mr. Evans’s book will meet with the high appreciation it so thoroughly deserves.

THE PENYCUIK EXPERIMENTS. By J. C. Ewart, M.D., F.R.S. (London : Adam and Charles Black, 1899.)

This attractively got-up volume is mainly a reissue in book form of three papers already published in the “Veterinarian” and the “Zoologist” ; but in addition we find an introduction of nearly a hundred pages, in which the author sets forth, in a lucid and interesting fashion, the general principles of breeding, and the problems which constantly present themselves for both theoretical and practical solution. After a short sketch of the characters of interest possessed by the nine zebra hybrids bred by the Professor (described more fully in a later portion of the book), a discussion is entered upon as to the meaning of the various principles known to the student of heredity as reversion, prepotency, telegony, saturation, and other subjects. Here we find reference to numerous experiments with pigeons, dogs, and rabbits, conducted by

the author with a view to proving the fact of reversion, and also to throw light upon the subjects of inbreeding and prepotency. Reversion is regarded more as a negative than a positive influence, and "mainly due to the development being abruptly arrested so as to reproduce a lost ancestor." Instances of reversion in horses are given, including remarks on the teeth, digits, and forearm. One conclusion arrived at from the experiments with regard to prepotency in the male is that the possession of such a quality may not necessarily make up for any deficiencies in the female.

In summing up the results of his "telegony" experiments, the Professor states that the evidence in support of undoubted "infection" having ever occurred is most unsatisfactory, and he regards the "reversion" hypothesis as sufficient to account for all the supposed cases of infection.

Part I. consists of two papers, the first on the Birth of a Hybrid between a Burchell's Zebra and a Mare, the second on Zebra-Horse Hybrids; Part II. is a discussion on Telegony, with observations on the striping of Zebras and Horses, followed by a section on Reversion in the *Equidæ*. All the papers are beautifully illustrated.

Science is much indebted to Prof. Ewart for the interesting, elaborate, and costly experiments that he has so successfully conducted at Penycuik. It is these original investigations, mainly, that render the book under consideration so eminently worthy of careful study by the practical breeder, the theoretical evolutionist, and the naturalist alike.

CONTRIBUTIONS TOWARDS A "CYBELE HIBERNICA"; BEING OUTLINES OF THE GEOGRAPHICAL DISTRIBUTION OF PLANTS IN IRELAND. Second Edition. Founded on the papers of the late Alexander Goodman More, F.R.S.E., etc. By Nathaniel Colgan, M.R.I.A., and Reginald W. Scully, F.L.S. (Dublin: Edward Ponsonby, 1898.)

The flora of Ireland is of very considerable interest to the botanists of Scotland alike in its likenesses and in its unlikenesses to the flora of Scotland. The "Cybele Hibernica" issued in 1866 by the well-known Irish botanists Moore and More has passed out of date (in no small degree owing to the stimulus given by it to a fuller knowledge and research), and a very great deal has been done since its issue to extend what was known as to the geographical distribution of Irish plants. Many systematic investigations have been undertaken, largely under the auspices of the Royal Irish Academy; and reports on these, and papers in the *Irish Naturalist* and elsewhere, added much to the records of earlier date. Mr. More hoped to be himself able to prepare and issue a second edition of the "Cybele"; but this his health did not permit him to accomplish. He left, however, numerous notes prepared for this end, set apart funds to pay the necessary expenses, and named Messrs. Colgan and

Scully as the editors. These gentlemen have discharged as a duty the trust committed to them, and to their labours we owe the handsome volume just issued. A comparison of the two editions shows how much has been done during the past thirty-two years in filling gaps in the earlier records; while the small number of actual additions to the flora as a whole (18 species and subspecies, of which one-third are more or less open to suspicion of having been introduced recently by man) warrants the belief that few plants not introduced by man remain to be discovered in Ireland. The total number of plants accepted as Irish is actually less than in the first edition, owing to the exclusion of several that had been included on evidence since proved insufficient. The "Editors" have not merely edited the book. While endeavouring to give full effect to the views of Mr. More, they have made several innovations, which are clearly indicated in the preface. The orders, genera, and species are rearranged in accordance with the sequence in the ninth edition of the "London Catalogue," though the names of species have not been followed. Among the new features are "reference to the soil-relations of plants where well marked; vertical ranges of all species not distinctly lowland; and introduction of the more widely current Irish plant names." The "Introduction" also has been recast and expanded. It treats of the origin and relations of the varied constituents of the flora, and is worthy of careful perusal. An "Alphabetical List of the principal Books, Papers, MSS., and Herbaria relating to the Flora of Ireland," coming down to 1897, forms a valuable aid to students of topographical botany.

"Excluded species," *i.e.*, "errors, casuals, and aliens not fully naturalised," are grouped together in an appendix. There is room for difference of opinion on the best mode of treating such plants; but, in view of the fact that the line of division is often very difficult to draw (and, indeed, is often dependent on the personal view of the recorder), while many of the weeds of cultivated ground, though admitted without question into "floras," are only introductions of very early date, there are strong reasons in favour of the more convenient method of including all in one series, with clear indications of their actual rank in the flora, as native or otherwise.

The book can be warmly commended to all interested in topographical botany, especially of the British Islands.

The Annals of Scottish Natural History

No. 31]

1899

[JULY

ON TWO RECENTLY DESCRIBED MICE FROM ST. KILDA.

By G. E. H. BARRETT-HAMILTON, F.Z.S., etc.

AT a meeting of the Zoological Society of London, I recently described as new two species of Mice from St. Kilda, and, at the request of the Editors of this journal, I practically reproduce my original contribution for the benefit of Scottish naturalists.

The existence of any wild species of Mouse on the isolated rock of St. Kilda is an occurrence so apparently unlikely, that when in 1895 a specimen resembling the Long-tailed Field Mouse (*Mus sylvaticus*) was found amongst some examples of the House Mouse (*Mus musculus*) sent to the British Museum in spirit, it was received with an amount of surprise certainly equal to the importance of the discovery. The specimen, a young male, had been collected and was presented to the Museum by Mr. J. Steele Elliott.¹ It was a very remarkable one, and bore unmistakable evidence of having come from an out-of-the-way part of the world. Its characteristics were, a larger foot and a smaller ear than the corresponding organs of typical *Mus sylvaticus*; while, what was no less noticeable, the very characteristic snow-white belly of our common Field Mouse was in this individual replaced by a uniform rufous colour shading

¹ Mr. Steele Elliott appears to have been the first person to collect specimens of the Mice of St. Kilda. Their occurrence on the island was, however, known previously to the outer world, and Seton states that "a cat is to be seen in almost every cottage, the mouse being the only wild animal on the island, and rats are still unknown" ("St. Kilda, Past and Present," 1878, p. 132).

imperceptibly through the flanks to the peppery reddish-brown of the upper surface.

All these peculiarities seemed to clearly point to a new species or subspecies of Mouse; but, the animal having been in spirit, its colour was regarded as unsatisfactory, and the unusual proportions of its ears and tail were ascribed to individual variation. And so the specimen was put on one side in the hope that in due time further examples might be procured.

Early in the spring of the present year I happened to come across the specimen, and, being greatly struck by its remarkable appearance, I at once endeavoured to procure some more of these St. Kilda Mice, with the result that my friend Mr. Henry Evans, during the course of a yachting cruise, put in at St. Kilda and landed some traps for me. Thanks to Mr. Evans, I have now before me, in addition to Mr. Steele Elliott's specimen, a fine adult pair, male and female, as well as a young female, of the St. Kilda Mouse.

The dimensions, in millimetres, of these St. Kilda Mice are as follows :—

	Head and body.	Tail.	Hind foot.	Ear.
♂ (skin : J. Steele Elliott, 1894)	81	85	25	--
♂ (,, H. Evans, 1898)	107	91	24.5	17
♀ (spirit : ,, ,,)	110	94	24	15
♀ (,, juv. ,, ,,)	82	77	24.5	15.5

They are thus remarkably large Mice for typical *Mus sylvaticus*, and the adults equal in size the largest measurements of the form known as *Mus flavicollis*, Melchior. The skull of the adult male is as large an example as I have ever seen, reaching a total length of 29 mm.

The following list of total lengths of the skulls of various *sylvaticus*-like forms will illustrate this point :—

	mm.	
<i>M. flavicollis</i> , ¹ ♂	29	Suffolk.
,, ♂	28	Hereford.
,, ♂	27	,,
,, ♀	28	,,
,, ♀	28	
<i>M. hebridensis</i> , ♂ (type)	27	
<i>M. sylvaticus</i> (old)	26	
,, (in general)	26 to 27.	

In form and proportions these Mice resemble *Mus hebridensis*, the form of *sylvaticus* described by my friend Mr. W. E. de Winton from the Isle of Lewis, Outer Hebrides ("Zoologist," Oct. 1895, p. 369). The adult female from St. Kilda (which is in spirit) may possibly

¹ The majority of these specimens have been placed at my disposal by my friend Mr. De Winton.

not be so stout in foot nor so small in ear as the Hebridean Mice, but the two forms are very close to each other, and there can be no doubt that the St. Kilda Mice belong to the Hebridean type, although their rufous belly has carried them a little further along the same line of development in which *Mus hebridensis* deviates from typical *sylvaticus*. In this respect I find that the most rufous skin of all is the first one collected by Mr. J. Steele Elliott. In it there is no perceptible line of demarcation between the colours of the upper and under surfaces, the transition from the one to the other being, as stated above, quite a gradual one. As regards the specimens obtained by Mr. Evans, the colour of the belly of the adult female, which is in spirit, agrees with that of Mr. Steele Elliott's specimen; but in the male, which has been made into a skin, the belly is slightly lighter, the median broad buff belly-line of *Mus hebridensis* is more evident, and there is a just perceptible line of demarcation between the colours of the two surfaces. The colour of the upper surface of the body of all the specimens is also, as in *Mus hebridensis*, more evenly distributed than in typical *sylvaticus*, there being less tendency to the development of a dark dorsal line.

It is exceedingly interesting to find this graduating series, and to have the gap between *Mus sylvaticus* and the St. Kilda Mouse partially bridged over by the occurrence of *Mus hebridensis* on the intervening islands.

This slight variation of the St. Kilda specimens in regard to the colour of the belly, the white colour of which is so extremely constant in and characteristic of *Mus sylvaticus*, is worthy of note, being exactly what we should expect to find in a comparatively new species which has not yet finally settled down into its new groove of development. We find thus that while in the colour of the belly some of the St. Kilda Mice may vary in the direction of *Mus hebridensis*, it is in this very respect that the latter form may vary in the direction of *Mus sylvaticus*. Indeed, in this point *Mus hebridensis* is very variable, and I have examined some Isle of Lewis specimens, especially those from the eastern coast, which come very close to *Mus sylvaticus* in the colour of the under side.

In addition to the above Mice, Mr. Evans also procured for me five specimens of the House Mouse of St. Kilda, of which the Museum already possessed five specimens collected on previous occasions, and preserved in spirit. These Mice are, if possible, of even greater interest than the *Mus sylvaticus*-like species, since they are characterised by the possession of a buff-coloured under side clearly marked off from the colour of the upper side by a distinct line of demarcation, and are thus very different from the ordinary almost uniformly smoky-brown coloured House Mice with which every one is familiar. The upper surface is also not of the typical

smoky *musculus* tint, but of a sepia-brown with a grizzled appearance due to many of the hairs being tipped with rufous. The lower parts of the hairs are exactly of the same shade as in *Mus sylvaticus*, for a dark specimen of which, at a casual glance from above, the animal might almost be mistaken. All these Mice—even the very young ones—agree in presenting similar characters, and altogether are quite the most distinct local form of *Mus musculus* which I have ever examined.

In form and proportions these Mice are well-developed large House Mice, only differing in this respect from ordinary Mice in being above the average size. The dimensions of the series which I have been able to examine are as follows (in millimetres):—

	Head and body.	Tail.	Hind foot.	Ear.					
♀ skin (suckling : Coll. G. E. H. B.-H.)	} 90	85	17	14	} 1898.				
♀ (spirit) „ „ .						88	81	15	12
♀ „ „ „ .						78	79	15	12.5
♀ „ „ „ .						87	84	16.5	13
♀ (spirit), suckling .	83	78	18	13	} Brit. Mus. Coll., presented by Mr. J. Steele Elliott.				
♀ „ „ „ .	85	85	17.5	13					
♂ (juv.) (spirit) .	75	65	16	10	} Brit. Mus. Coll., presented by the Kelvingrove Mu- seum.				
♀ (spirit), very young	52	52	14	10	1898.				
— „ „ „	65	67	15	10	} Brit. Mus. Coll., presented by Mr. J. Steele Elliott.				
— „ „ „	53	60	16	10.5					

The arrangement of the mammæ is as in *Mus musculus*, there being ten pairs in all, of which three are pectoral and two inguinal.

The skulls and dentition of these Mice are in general appearance and size very *musculus*-like in character, but the triangular narrowing of the internal opening for the nostrils is even more strongly marked than in ordinary specimens of *Mus musculus*. All the St. Kilda skulls possess this peculiar narrowed palate, a character which I can only find in one out of over fifty specimens of *Mus musculus*-like Mice in the British Museum Collection, and that one is a specimen of the subspecies *Mus jalapa* (Allen and Chapman) from Mexico. The greatest lengths of four skulls from St. Kilda are 22, 22.5, 23, and 23 millimetres.

It is obvious that, according to the custom of modern naturalists, these two forms of Mice need new names.

I therefore proposed the following names, leaving the question as to the exact status of the two new forms to be decided when we are in possession of a fuller knowledge of the other species or subspecies of Mice of the respective groups. As to the desirability of bestowing names on the two Mice from St. Kilda, I can have no doubt whatever, but as to whether they are fit subjects for a

binomial or for a trinomial treatment I am less certain, until I have had time to study the *musculus*- or *sylvaticus*-like Mice of the whole Palæarctic Region. For many reasons it would seem convenient to apply the trinomial system to all forms which can be clearly shown to be local developments of any other form. By such a method a clue is given to the relationships of the various local forms—a matter of no small importance to the student of a large and difficult genus like that of *Mus*. On the other hand, we have, in the present instance, two forms which, although obviously coming within the above definition, are perfectly isolated and do not intergrade with the parent form. Regarded from this point of view, they have as much claim to be accorded full specific rank as any other island species, and the latter is, perhaps, the most satisfactory method whereby to deal with them.

The following are the names which I propose :—

MUS HIRTENSIS, *Barrett-Hamilton*.

Closely allied to *Mus hebridensis*, from which, however, it differs in its slightly larger size, as stated above, and also in the greater amount of buff or yellowish-brown coloration on the under side. Like *Mus hebridensis*, it differs from typical *sylvaticus* in the more uniform coloration of the upper surface of the body, in the absence of the clearly defined white under side, and in the longer feet and smaller ears. The skull is similar to that of *Mus hebridensis*, but appears to be larger, equalling in size that of the largest specimen of *Mus flavicollis*.

MUS MURALIS, *Barrett-Hamilton*.

In shape and proportions allied to *Mus musculus*, but more robust and larger in size. In general colour of the upper surface resembles a dark specimen of *Mus sylvaticus typicus*, the base of the hairs being of the same colour as in that species, but having the extremities of the majority of a sepia-brown colour; mixed among these are a certain proportion of rufous-tipped hairs, which give the animal a grizzled appearance. The colour of the under surface is very remarkable, being buff, clearly separated by a well-marked line of demarcation from the colour of the upper surface of the body. The skull, as compared with that of typical *Mus musculus*, is remarkable for the greatly exaggerated narrowness of the posterior opening of the nostrils.

The interest possessed by these two Mice, which undoubtedly represent local developments of *Mus sylvaticus* and *Mus musculus*, will be better appreciated if I briefly discuss the variations to which *Mus musculus* and *sylvaticus* are subject in other localities.

I assume, however, from the outset that in neither case am I dealing with an animal which may have been recently introduced

to the island. The great amount of variation from the type of a species which varies so little as *Mus sylvaticus*, as shown in the one case, and the evolution of a perfectly uniform and distinct type of coloration in one so variable as *Mus musculus* in the other, are both characters which would seem to have taken no inconsiderable time for their development. So that even if, as is possible, the presence of a *Mus musculus*-like species of Mouse on St. Kilda be due in the beginning to a case of introduction, such an introduction could not have taken place at a very recent period in the history of the island, which is known to have been inhabited for at least several centuries.

The distribution of *Mus sylvaticus* is almost coterminous with the limits of the Palæarctic Region, the species only just reaching the confines of the Oriental Region "in Gilgit, where it is common from 5000 to 10,000 feet elevation" (Blanford's "Mammals of India," p. 416). In the former region it is probably as widely spread as any other mammal, as it seems to be almost regardless of the influence of temperature, and is found far up the slopes of the mountains. It is equally at home in all the countries, except probably the great sandy deserts, from the Eastern coast-line of China to the Atlantic. It has reached Morocco, Algeria, and Palestine, and has found its way to most of the islands, such as those of the Mediterranean, the Channel Islands, Great Britain, Ireland, the Scotch Islands, the Shetlands,¹ and even Iceland, where the local form (*Mus islandicus*, Thien.) is said to be the only indigenous species of mammal.

Its presence in such isolated, yet widely separated islands, as Iceland and Corsica, seem to mark it as a species which has for long maintained a wide area of distribution, and which had already occupied the greater part of its present range before these and the other islands, where it is now found, were finally separated from the Continent as such, but still formed a part of the continuous Palæarctic land area. And of its antiquity we have sufficient proof, for its bones have been found in numerous caves on the Continent and in the English Forest-bed; and we have no trace of its ancestry, the Pleistocene species *Mus orthodon*, Hensel, and *abbotti*, E. T. Newton, being at least as specialised as itself.

Not only is *Mus sylvaticus* of exceedingly wide distribution, but throughout the immense area where it is found it remains remarkably constant to a single well-marked type. Throughout the Palæarctic Region it is distinguishable at a glance from every other Mouse with which it might possibly be confounded by the pattern of its teeth, its

¹ A set of four from Dunrossness, for which I am indebted to Mr. Henderson, has recently reached me; I am unable to separate them from *Mus sylvaticus* of Western Europe and Great Britain, and the same remark applies to some specimens collected for me by Mr. W. Eagle Clarke on Alderney.

long foot, large ears, and pure white belly, separated from the rufous colour of the upper side by a strong and clearly marked line of demarcation. It is true that these peculiarities show a slight tendency to local variation, so that two or three local forms of *Mus sylvaticus* may be recognised; but the variation is so slight that it takes a specialist to distinguish *Mus chevrieri*, M.-Edw., of Tibet and China from *Mus arianus*, Blanf., of Persia and Afghanistan, or *Mus sylvaticus*, Linn., of Europe.

Within the confines of Europe the animal seems to hold quite firmly to one particular type, so that I am unable to distinguish specimens from Corsica from those of Ireland or France.

Mus sylvaticus is then obviously a species which, in its long-standing and successful struggle for existence, has attained to a height of specialisation from which it has either very little power of variation, or else which is such as to fulfil all the needs of the species in almost any conditions with which it may be brought into contact. It is a species which further and even minute study may find unprofitable, or even impossible, to split into local subspecies. Not that I wish to imply that local variations are absent or even rare in *Mus sylvaticus*. They are by no means so, but their presence is infinitely less abundant or conspicuous than is the case with other and perhaps equally widely spread mammals.

It is then extremely interesting to find that the representatives of *Mus sylvaticus* in the Hebrides and St. Kilda show as much divergence from the type as examples from any other locality with which we are acquainted, and it is an evident sign of the antiquity of the animal at St. Kilda, and a seemingly irrefutable argument against any theory of its introduction into the island—apart from the fact that its presence in the Channel Islands, in Iceland, Norway and Sweden, the Shetlands, Ireland, and the Inner and Outer Hebrides marks it out as the species *par excellence* of all others in the Palearctic Region which we should most expect to find in an out-of-the-way island. And, to judge by its large size and robust form, it has had no difficulty in maintaining its existence at St. Kilda.

I think, then, that we have a good deal of evidence to support us in supposing that *Mus hirtensis* is indigenous to St. Kilda; and, indeed the very position of this rock, facing as it does the Western Hebrides and with a channel of no very great depth between it and them, throws no difficulty in the way of the hypothesis that the continuous land-area which enabled *Mus sylvaticus* to reach the Shetlands, Scotland, the Hebrides, and Ireland, should have included also St. Kilda in its surface—an event which might be brought about by an elevation of about 60 fathoms only.

That such a land connection must have been of geologically quite recent existence is a matter of no difficulty for a zoologist, since the whole of the Mammalian fauna in Ireland and Britain is so

similar to that of the Continent, that it is inconceivable (unless *all* the species are introductions) that it can have existed in our islands for any, geologically speaking, long period of time. Even the most plastic of British Mammals, such as the Squirrel, have only advanced a comparatively short distance on the road of differentiation; and as regards Birds there is a precisely similar story to be told, there being only one really well-differentiated peculiar British species, the Red Grouse (*Lagopus scoticus*). In fact, one of the strongest arguments against my friend¹ Dr. R. F. Scharff's brilliant theories as to the age of the Irish fauna is, that were it so old as he would make it, we should expect to find not only peculiar species but even peculiar genera among the mammals of Ireland, whereas a most careful study has hitherto only sufficed to distinguish one certainly peculiar species, the Irish Stoat (*Putorius hibernicus*), and that bears in itself very clear evidence of its recent origin. Another species or subspecies, the Irish Hare (*Lepus hibernicus*), seems also to be distinguishable, but it is not nearly so distinct as the Stoat. Among Birds, Reptiles, and Amphibians naturalists have hitherto failed to find any peculiar local forms, although it is evident that the Grouse of Western Great Britain and of Ireland is following on the same route as the Irish Stoat and Hare.

Can there, then, be any great difficulty in supposing that *Mus hirtensis* is indigenous to St. Kilda, and that it reached the island at a (geologically speaking) comparatively recent period, when there was in existence a land-surface connecting the Shetlands, Orkneys, Scotland, the Hebrides, St. Kilda, and Ireland; and that that connection must have been so (geologically speaking) recent that few of our native mammals have had time to develop into species or even subspecies distinct from those of the continent of Europe? That the Mouse of St. Kilda should be the one in which variation has proceeded further than in other localities is quite in accordance with the isolated situation of and confined space on the rock, together with its full exposure to the Atlantic winds.

To assert that the Mouse of Iceland has reached that island along a formerly continuous land-area would be a very different matter, since not only is there a deep channel between the Faroes and Iceland, and even between the former islands and the Shetlands, but, if we consider that *Mus islandicus* is native to Iceland, then we should expect to find a similar or representative species in the Faroes, and of that we have as yet no record.

Yet that there has *never* been such a land connection will not, I suppose, be contended by anybody, so that the question in reality resolves itself into one dealing with the time at which such a connection existed, and whether it has been sufficiently recent to allow of a passage along it of such a presumably recent mammal as a

¹ See "Proc. R. I. Acad.," July 1897, p. 427.

Mouse. Although we cannot expect to decide such questions from a mammalian point of view alone, it is profitable to remember that such "an old land extension connecting Greenland, Spitzbergen, and Scandinavia with Scotland and Ireland" is relied upon by the editors of the recently published second edition of the "Cybele Hibernica" (Introduction, pp. li., lii.) as the only reasonable explanation of the presence in Ireland, and undoubtedly native there, of three plants of North American habitat, two of which are unknown in continental Europe; nor would there seem to be any better explanation forthcoming to account for our share in Ireland of Invertebrates¹ indistinguishable from certain North American forms.

Similarly Mr. A. H. Keane,² although writing on a widely different subject, regards the "submarine bank, which stretches from Scotland through the Faroes and Iceland to Greenland," as representing a "vanished continent of great age, which would appear to have still formed dry land in late Tertiary times."

But the present paper deals not with the question of a submerged Euro-American continent, but with the Mice of St. Kilda, and I must content myself with pointing out in conclusion that the recent expedition of exploration to Rockall,³ the most westerly rock-islet off the European continent, found that when trawling at a distance of about 15 miles south of that rock, "the water shoaled to 80 fathoms, and there was brought up in the net a most unexpected assortment of shallow-water shells, evidently long since dead. Amongst these were several kinds of Pecten, *Venus casina*, *V. fasciata*, *Mytilus modiolus*, etc." In the words of the Rev. W. S. Green: "How, under present conditions, such shells could be found living anywhere on the bank was difficult to understand. It would seem to afford the strongest confirmation to the theory that the time is not so very long distant when there was more land, with a shallow coast-line, and possibly extensive sandbanks, where now the pinnacle of Rockall is the only speck acting as a memorial stone to what tradition has called the 'Sunken Land of Buss.' After the shallow sandbanks had vanished, these molluscs may have accommodated themselves to a deeper sea than is usual for such organisms to live in, and it may be that it is only now that the conditions are becoming too severe for their further existence. There is, of course, the possibility that these shells may have come from the bottom of icebergs which had grounded in Greenland or Spitzbergen bays, but I doubt if in times sufficiently recent such bergs have visited the position occupied by Rockall, and therefore the former theory seems the more probable.

"The possibility of the shells having been brought as bait for

¹ See "Irish Naturalist," vol. iv. pp. 25, 122; vol. vi. pp. 225, 257.

² "Ethnology," 1896, p. 231.

³ See "Trans. R. I. Acad.," vol. xxxi. pt. 3, pp. 45-46 (1897).

the lines of the fishing-boats visiting the bank is, I think, disposed of by the mixed character of the deposit, some of the shells being unsuitable for such a purpose. It would be interesting to trace out the area occupied by these dead shells, and, possibly, to search in a similar manner for the lost land of Hy. Brassil on the Porcupine Bank, but the time at our disposal only gave us the chance for one dip into this deposit."

Turning to *Mus musculus*, we have to deal with a very different species, and I do not in this case attempt to prove that this animal has reached St. Kilda without the help of man. That it must have existed there for a considerable time, perhaps for hundreds of years, is, however, as I hope to show, very probable. Well known and widely spread in almost all regions where the habitations of man afford it a refuge, it is impossible to state what is the native home of the species. Not only is the domestic form of *Mus musculus* widely spread and readily susceptible of introduction into the houses of its unwilling protector, man, but its variability is as remarkable as is the constancy to type of *Mus sylvaticus*. Still it has never, I believe, been asserted that the species is anything but an introduction into Western Europe, including the British Islands.

Light or yellowish varieties of *Mus musculus* have from time to time received names such as *M. hortulanus*, Nordmann, *M. nordmanni*, Keys. and Blasius, *M. flavescens*, Fisher, and *M. flaviventris*, Lataste; the last two preoccupied by names applied to other species of the genus. In addition, however, to these almost domestic members of the *Mus musculus* group of Mice, we have in many parts of the world wild forms of Mice which, though differing to a more or less extent in their size, length of tail, and colour, cannot be distinguished from *Mus musculus* in their skull and teeth. Such Mice are *M. bactrianus*, Blyth, and *M. gentilis*, Brants, which are widely distributed in the deserts respectively of Asia and N. Africa, and *M. wagneri*, Eversm. (= *M. pachycercus*, Blanford), of Central Asia; the latter a true House Mouse, often found inhabiting houses, and differing in no cranial characters from *Mus musculus* proper.

Lastly, we have a set of Mice, also of varied colours, size of body, and proportion of tail, but mostly characterised by the possession of a white belly, which are found in many of the regions where typical *Mus musculus* occurs. Such are *M. spretus*, Lataste, of the Barbary States, and *M. spicilegus*, Petenyi, of Hungary, France, Portugal, and Western Europe. These Mice may occur in close propinquity to the typical *Mus musculus*, as was found by Mr. Oldfield Thomas in Portugal and by myself in Morocco.

Among all these perplexing forms it is indeed difficult to assign a proper place to *M. muralis*, and more so to hazard even a guess as to the possible origin of the domestic races of *Mus musculus*. We know, however, that almost everywhere where there are deserts

there a *bactrianus*-like Mouse is found, so that *M. bactrianus* is perhaps as widely distributed in deserts as is *Mus musculus typicus* in houses. It seems to me, therefore, probable that both *Mus bactrianus* and *Mus musculus* are developments of some original parent form to suit particular conditions, and we may perhaps look for the latter to some Central Asian species like *M. wagneri*.

Some of the white-bellied forms which are found in a wild state in Western Europe, and in other countries where *Mus musculus typicus* occurs in houses, may be cases of reversion from the latter, which is no doubt almost certainly the origin of such races as are found on islands, such as the Salvage Islands, where *Mus musculus* must have been accidentally introduced. But it by no means follows that this is the case with *Mus spicilegus*, the size and proportions of which are so much finer than in true *Mus musculus* and the tail shorter. *Mus spicilegus*, indeed, might even be regarded as a wild parent form of *Mus musculus*, and it is not with it, but the forms which are certainly reversions from true *Mus musculus*, that we must associate *Mus muralis* of St. Kilda; and it is interesting to note that the similarly derived Mice of the Salvage Islands resemble those of St. Kilda very closely in their robust form.

That a wild race of *Mus musculus* can be rapidly evolved from Common House Mice when living in a wild state has been recently shown by my friend¹ Mr. H. Lyster Jameson. This gentleman has clearly made out his case for the formation of an incipient species of Mouse on the North Bull, Dublin Bay, Ireland, a tract of sandhills about three miles in length and almost completely isolated from the mainland.

This sandbank is known not to have been in existence longer than about 100 years, so that the coloration described by Mr. Jameson must have been evolved in at most a period of that length.

Mr. Jameson lays great stress on the value of the change to these Mice as a protective feature, and so he has not, I think, given sufficient emphasis to the fact that we have here a clear instance of the rapid development of an incipient subspecies of Mouse with an exact period laid down in which the change occurred; and we may fairly, I think, use Mr. Jameson's results in dealing with other species or subspecies of Mice.

If we are to judge from the analogy of Mr. Jameson's Mice, we must conclude that the Mice of St. Kilda have been in that island for a considerable time. Not only are they more distinct in colour than any other local form of *Mus musculus* with which I am acquainted (and I have been through the whole of the specimens in the British Museum Collection), but their line of development seems to have become fixed, and is, as in the case of Mr. Jameson's Mice, no

¹ "Journ. Linn. Soc. Zool.," vol. xxvi., 'On a Probable Case of Protective Coloration in the House Mouse (*Mus musculus*, Linn.),' pp. 465-473.

longer in a state of uncertain evolution. On the North Bull sand-hills, indeed, Mr. Jameson found not only Mice which had progressed for a considerable distance along the path of their new development, but also Mice which showed every kind of gradation from those which had white bellies to those which exhibited the characters of perfectly typical *Mus musculus*.

I think, then, that we may safely conclude that *Mus musculus* is of at least several hundred years' standing at St. Kilda.

There is one extremely interesting point which should not be forgotten in connection with these two St. Kilda Mice, namely the fact that we have here a clear opportunity of studying the effect on two distinct species of the same genus of isolation side by side on the same island. Here we have, on a circumscribed space, two species in the course of evolution, the progress of which may be easily studied from time to time. The species having now been described, we can in twenty or thirty years' time, by comparing specimens taken then and now, estimate the amount of change which they will in that time have undergone. It is interesting to note, however, that so far the effect of isolation on the island is not similar in the case of the two species, since apparently the Mouse which must be supposed to have been the longer time at St. Kilda is the very one which has varied in a lesser degree than that one which we must regard as an introduction. For *Mus hirtensis*, which appears to have been on St. Kilda since that island was in connection with the mainland, is certainly not much more different from *Mus sylvaticus* than is *Mus muralis* from *Mus musculus*, yet *Mus muralis* can only be an introduced species of at most a few hundred years' standing. Nothing can give stronger emphasis to the fact that different species possess different powers of variability and follow a different course of evolution, so that it seems that we cannot predict what will happen under certain circumstances to one species from our experience of what has happened to another. Every species, it would appear, has its own rules for evolution and development, which must be applied to it and to it alone.

REPORT ON THE MOVEMENTS AND OCCURRENCE OF BIRDS IN SCOTLAND DURING 1898.

By T. G. LAIDLAW,

Member of the British Ornithologists' Union.

THE Schedules returned for 1898 number fifty-three, an increase of seven over those received for the preceding year. The Lighthouses and Coast Stations furnish twenty-three

schedules; the remaining thirty coming from inland observers.

It is a matter for satisfaction that the number of observers who send in records continues to increase; but there are still many districts inadequately represented. The important faunal areas of Moray, West Ross, and Solway may be specially mentioned in this respect.

Any one desirous to assist by transmitting their observations may obtain schedules from Mr. Eagle Clarke, Museum of Science and Art, Edinburgh.

We have to record our hearty thanks to all those who have assisted in these inquiries by forwarding schedules or notes.

The following list gives the names of the observers from whom reports have been received. The localities are arranged under the different faunal areas, proceeding from north to south, along the East and West Coasts.

SHETLAND.

<i>Locality.</i>	<i>Name of Observer.</i>
North Unst L.H.	The Lightkeepers.
Foula	Francis Traill.
Dunrossness	Thomas Henderson, jun.
Various Localities	Robert Godfrey, M.A.

ORKNEY.

North Ronaldshay L.H.	John A. Mackay, Lightkeeper.
Pentland Skerries L.H.	Robert A. M'Harrie, Lightkeeper.

SUTHERLAND AND CAITHNESS.

Cape Wrath L.H.	Neil M'Donald and William Crowe, Lightkeepers.
Thurso	Lewis Dunbar.
Various Localities	Robert Godfrey, M.A.

MORAY.

Forres	William Brown.
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DEE.

Rattray Head L.H.	Robert Clyne, Lightkeeper.
Peterhead	Rev. William Serle, M.A.
Aberdeen	L. G. Esson.

TAY.

<i>Locality.</i>	<i>Name of Observer.</i>
Auchinblae, Fordoun	John Milne.
Blair Atholl	William Evans.
Ballinluig	Bruce Campbell.
Tayfield	William Berry, B.A., LL.B.

FORTH.

Isle of May L.H.	T. E. Arthur, Lightkeeper.
Row, Doune	Lt.-Col. Duthie.
Lothians and Aberfoyle	William Evans.
Edinburgh District	Bruce Campbell.
Dalmeny Park	Charles Campbell,
Various Localities	Robert Godfrey, M.A.

TWEED.

Broughton	A. C. Gairns.
Halmyre	D. G. Laidlaw.
Chirnside	Charles Stuart, M.D.

OUTER HEBRIDES.

Island Ghlais L.H.	James M'Guffie, Lightkeeper.
North Bay, Barra	John MacRurie, M.B.

ARGYLL AND INNER HEBRIDES.

Skerryvore L.H.	J. Nicol and William Ross, Lightkeepers.
Dhuheartach L.H.	William Begg, Lightkeeper.
Skervuile L.H.	Robert M'Intosh, Lightkeeper.
Scarnish, Tiree	Peter Anderson.
Ben Nevis	The Observatory Staff.

CLYDE.

Lamlash L.H.	James Edgar, Lightkeeper.
Turnberry Point L.H.	Thomas J. Wallace, Lightkeeper.
Carmichael, Thankerton	Rev. J. D. W. Gibson.
Various Localities	John Paterson, John Robertson, H. B. Watt, and Robert Wilson.

SOLWAY.

Mull of Kintyre L.H.	William Quine, Lightkeeper.
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GENERAL REMARKS.

The series of mild winters was not broken by that of 1897-98, and the spring was also of the same character as the preceding year; namely, wet and cold for the most part, and therefore retarding migration. To some extent the summer visitants were late in arriving, and conspicuously fewer in number than usual in most districts.

The pronounced spring movements were few in number. At North Ronaldshay, on April 21st, Wheatears and other small birds were in swarms all night; and at Dunrossness there was a remarkable rush, culminating on April 30th, details of which are given in "Annals," 1898, pp. 178-179. At Tiree, on April 19th and 26th, White Wagtails in numbers were passing north, and on April 29th and May 6th the usual passage of Whimbrels was observed. At Skerryvore, on April 22nd, a rush of Pipits, Whinchats, Wheatears, and Warblers took place.

The principal autumn migratory movements on the East Coast occurred on Oct. 8th, 20th, and 21st, when Song Thrushes, Redwings, Fieldfares, Starlings, etc., were in swarms at Dunrossness, N. Ronaldshay, and Rattray Head.

On the West Coast, from Sept. 7th to 9th, rushes of Wheatears, Wagtails, Pipits, and other small birds are recorded from Dhuheartach, Skerryvore, and Lamlash. Other rushes are noted from these stations, and from Skervuile and Mull of Kintyre, on Oct. 9th to 22nd, Nov. 8th and 9th, and 19th and 20th, the birds mainly being Thrushes, Blackbirds, Redwings, Fieldfares, Goldcrests, and Woodcocks.

The appearance of the Great Spotted Woodpecker, in unusual numbers, in many widely separated districts, and the flocks of Jays that in the autumn invaded the south-western counties, may be alluded to as special features of the fall movements.

The interesting occurrence of Macqueen's Bustard at Pitfour, Aberdeen, on Oct. 22nd, the first Scottish example, is the chief ornithological rarity of the year. Among other casual visitants to Scotland may be mentioned the Black-bellied Dipper, at Dunrossness, on Nov. 27th; Golden Oriole, Arbroath, June 8th; Red-backed Shrike,

from Dee, Tay, and Forth; Waxwing, from Moray and Clyde; Ortolan Bunting, Dunrossness, April 30th; Hoopoe, Isle of May, April 30th, and Dunbar, Oct. 17th; European Hawk Owl, Aberdeen, Nov. 21st; Marsh Harrier, Kirk-michael, Solway, in May; Garganey, Pitfour, Oct. 22nd; Spotted Crake, Dunbar, Oct. 18th; and Baillon's Crake, Caithness, Sept. 13th.

The following species, obtained in Scotland in 1897, were not included in the Report for that year:—Rose-coloured Pastor, Inverbroom, West Ross, Aug. 16th; Lesser Kestrel, Bognalie, Aberdeen, Oct. 25th; and Great Shearwater, St. Kilda, Aug. 7th.

The nesting of the Pintail at Loch Leven, as described by Mr. William Evans in "Annals" (1898, pp. 162-164), and the extension of the breeding range of the Fulmar in Shetland, as reported by Mr. Robert Godfrey, are points worthy of note.

TURDUS MUSICUS (Song Thrush).

Orkney—North Ronaldshay, Oct. 21, all night, swarms, 110 killed at lantern; Pentland Skerries, Oct. 21, with Fieldfares and Starlings. *Sutherland*—Cape Wrath, March 7, several with Blackbirds. *Dee*—Ratray Head, Oct. 20, at lantern, with Starlings and Redwings; Peterhead, Oct. 29, strong rush. *Forth*—Isle of May, Oct. 7, flocks at lantern. *Argyll and Isles*—Skerryvore, Oct. 19, a rush of Turdidæ, Larks, etc., many killed; Nov. 8-9, rush; Nov. 19, great rush with Larks, Goldcrests, etc. Dhuheartach, Oct. 19-20, great rush of birds; Nov. 17, midnight, at lantern; Nov. 19-20, rush of Turdidæ, etc. Skervuile, Oct. 19-20, a great many with Starlings and Blackbirds. Tiree, March 14, left; Oct. 15, arrived. *Clyde*—Lamlash, Oct. 25-26, a rush. *Solway*—Mull of Kintyre, Nov. 9, very numerous at light.

Principal movements, Oct. 20-21, E.; Oct. 17-20, Nov. 19-20, West Coast.

TURDUS ILIACUS (Redwing).

Shetland—Dunrossness, April 30, many; Oct. 8, very numerous; Oct. 20, numerous with Blackbirds. *Dee*—Ratray Head, Oct. 20, many killed. *Forth*—Boghall, Oct. 6, a few; Isle of May, Oct. 29, several at lantern. *Tweed*—Channelkirk, Oct. 1, seven; Chirnside, Oct. 24, with Fieldfares. *Outer Hebrides*—Barra, Oct. 19. *Argyll and Isles*—Skerryvore, April 22, with other birds; Oct. 13-14, many striking; Oct. 22, striking hard all night; Nov. 8-9, with Fieldfares, etc.; Nov. 19, great rush of birds. Dhuheartach, Oct. 19-20, rush,

numbers all night; Nov. 20, in flocks round lantern. Skervuile, Nov. 8, 1 A.M., with Starlings. Tiree, March 10, several; Nov. 4. *Clyde*—Mearns, Oct. 9, 15-20. Carmichael, Oct. 21, many.

Earliest observed, Oct. 1, Channelkirk. Principal movements, Oct. 19-20, Nov. 19-20.

TURDUS PILARIS (Fieldfare).

Shetland—Dunrossness, April 30, many; Oct. 21, large flock. *Orkney*—Pentland Skerries, Oct. 21, rush; Oct. 31, killed at light; Nov. 2, flock. *Dee*—Peterhead, April 24; Oct. 29, rush with Thrushes, etc. *Tay*—Fordoun, Nov. 13, very large flock. *Forth*—Midcalder, May 24, small flock; Heriot, Oct. 14; Isle of May, Oct. 29, large flock. *Tweed*—Halmyre, May 12, large flock passing N.W.; Chirnside, Oct. 24, many. *Outer Hebrides*—Barra, Nov. 9. *Argyll and Isles*—Skerryvore, Oct. 22, striking all night; Nov. 8-9, rush with other birds; Nov. 19, great rush of birds. Dhuheartach, Oct. 19-20, flying round all night; Nov. 9, at light with other birds. *Clyde*—Gartcosh, April 30, one; Carmichael, Oct. 12, flock; Lamlash, Oct. 25-26, a rush.

Earliest observed, Oct. 12, Carmichael. Principal movements, Oct. 20-22, Nov. 9-19.

TURDUS MERULA (Blackbird).

Shetland—Dunrossness, Oct. 20, numerous. *Sutherland*—Cape Wrath, March 7; Dec. 3, 8, several with Thrushes. *Dee*—Peterhead, Oct. 29, strong rush. *Forth*—Isle of May, Nov. 16, few at lantern. *Argyll and Isles*—Skerryvore, Oct. 7-8, caught at light; Oct. 19, in rush of Turdidæ, many killed; Nov. 8, 19, in rush of birds. Dhuheartach, Oct. 19-20, many all night; Nov. 9, many round light; Nov. 20, at lantern. Skervuile, Oct. 19-20, many killed. Tiree, March 21, have left. *Clyde*—Lamlash, Oct. 2, 5, at light with Thrushes, etc.; Oct. 25-26, a rush. *Solway*—Mull of Kintyre, Nov. 9, in rush with Thrushes, etc.

TURDUS TORQUATUS (Ring Ousel).

Shetland—Dunrossness, April 30, many in rush of birds. *Forth*—Aberfoyle, April 16. *Tweed*—Halmyre, April 28, a ♂. *Argyll and Isles*—Skerryvore, Sept. 15, killed at light, numbers flying about. *Clyde*—Lamlash, April 7. *Solway*—Mull of Kintyre, March 3, one seen; April 1, one.

Earliest observed, March 3, Mull of Kintyre.

PRATINCOLA RUBETRA (Whinchat).

Shetland—Dunrossness, April 30, adult ♂, "new to Shetland" ("Annals," 1898, p. 178). *Tay*—Ballinluig, May 2. *Forth*—Braid Hills, May 4. *Tweed*—Broughton, April 11; Chirnside, Aug. 12.

Outer Hebrides—Barra, May 1. *Argyll and Isles*—Skerryvore, April 22, a rush with Wheatears, etc. Dhuheartach, Aug 17-18, at lantern with other birds; Sept. 8-9, many passing. *Clyde*—Lamlash, April 19. Earliest, April 11, Broughton.

SAXICOLA ŒNANTHE (Wheatear).

Orkney—North Ronaldshay, April 17, a few; April 21, swarms all night. Pentland Skerries, May 8; Sept. 13, three. *Dee*—Peterhead, Sept. 5-12, migrating; Sept. 27, last seen. *Forth*—Harlaw Muir, April 13. Isle of May, April 26, first arrival; Oct. 10. *Tweed*—Broughton, April 11; Halmyre, April 14, three seen; Chirnside, Sept. 30, last seen. *Argyll and Isles*—Skerryvore, Feb. 5, one flying about rock; April 18, three; April 22, a rush with other birds; Sept. 8-12, many striking light; Sept. 15-18, at lantern till daylight. Dhuheartach, Aug. 17-18, great numbers round light, mostly young; Sept. 8-9, many with other birds; Oct. 19-20, great rush with other birds, many killed. Skervuile, Aug. 18, many, several killed. Tiree, April 11, arrived. *Clyde*—Lendalfoot, March 19. Lamlash, April 5, a pair; May 3, a rush with Wagtails and Willow Wrens; Sept. 7-8, a rush with other birds. Turnberry, April 18, two at lantern. Balgray Dam, Oct. 1. *Solway*—Mull of Kintyre, April 11, one.

Earliest, Feb. 5, Skerryvore; latest, Oct. 19, Dhuheartach. Principal movements, April 21, Aug. 17-18, Sept. 8-12.

RUTICILLA PHŒNICURUS (Redstart).

! *Shetland*—Dunrossness, April 30, many with other birds. *Orkney*—North Ronaldshay, May 1, a few. *Dee*—Ratray Head, May 22, a ♂. *Tay*—Fordoun, Sept. 15, left; Ballinluig, May 1. *Forth*—Aberfoyle, April 17. *Tweed*—Chirnside, Aug. 4; Broughton, April 21. *Clyde*—Turnberry, April 18, one at lantern; Thornliebank, April 22.

Earliest, Aberfoyle, April 17; latest, Fordoun, Sept. 15.

ERITHACUS RUBECULA (Robin).

Shetland—Dunrossness, April, end of, astonishing numbers. ("Annals," 1898, pp. 178-179). *Orkney*—North Ronaldshay, May 6, one at lantern. *Sutherland*—Cape Wrath, March 7, several. *Dee*—Peterhead, Sept. 5, a few arriving; Sept. 11, numerous. *Argyll and Isles*—Tiree, Oct. 3.

SYLVIA CINEREA (Whitethroat).

Dee—Ratray Head, May 22, great numbers; Peterhead, May 14, first. *Tay*—Lindores, May 5. *Forth*—Braid Hills, May 4, several. *Tweed*—Halmyre, May 4, several; Chirnside, May 4-

Sept. 12. *Outer Hebrides*—Barra, May 20, two. *Argyll and Isles*—Dhuheartach, Sept. 9, killed at lantern. *Clyde*—Crookston and Thornliebank, May 1; Dalbeth, Aug. 31.

Earliest, Crookston, May 1; latest, Chirnside, Sept. 12.

SYLVIA CURRUCA (Lesser Whitethroat).

Outer Hebrides—Barra, Oct. 24, not hitherto been obtained in the *Outer Hebrides* ("Annals," 1899, p. 109).

SYLVIA ATRICAPILLA (Blackcap).

Tweed—Chirnside, May 10, Sept. 5. *Clyde*—Carluke, May 2.

SYLVIA HORTENSIS (Garden Warbler).

Forth—Duchray, May 9; Arniston, May 12. *Tweed*—Chirnside, Sept. 10. *Outer Hebrides*—Barra, Oct. 24 ("Annals," 1899, p. 109). *Clyde*—Carluke, May 5; Beith, May 6.

REGULUS CRISTATUS (Gold-crested Wren).

Shetland—Dunrossness, April 15, one; April 30, many; Oct. 11, one. *Orkney*—Pentland Skerries, Sept. 30, one; Oct. 8-10, passing. North Ronaldshay, Oct. 31, four at lantern. *Dee*—Peterhead, Oct. 13, on migration. *Forth*—Isle of May, Oct. 13, two dozen. *Outer Hebrides*—Barra, April 9, pair seen; Sept. 16, a few. *Argyll and Isles*—Skerryvore, March 22, killed at lantern, other birds striking; April 22, with rush of small birds; Nov. 19, great rush, many striking. Dhuheartach, Oct. 19-20, numerous; Nov. 19-20, at light. Skervuile, Oct. 9, at lantern. *Clyde*—Lamlash, April 6, several; July 30, midnight, at lantern; Oct. 11, at light. *Solway*—Mull of Kintyre, Nov. 9, in rush with other birds, at light.

PHYLLOSCOPUS RUFUS (Chiffchaff).

Forth—Aberfoyle, April 6, first. *Tweed*—Chirnside, March 30, Oct. 1. *Clyde*—Barr, Ayrshire, April 9, several.

Earliest, March 30, Chirnside.

PHYLLOSCOPUS TROCHILUS (Willow Wren).

Dee—Ratray Head, May 22, many; Peterhead, May 2, first; Aug. 25, last. *Tay*—Fordoun, May 1, arrived; Aug. 28, last. Tayfield, May 3, first; Ballinluig, April 30; Blair Atholl, Sept. 9. *Forth*—Aberfoyle, April 18; Dalmeny, April 16, Sept. 4. *Tweed*—Halmyre, April 25, several; Chirnside, April 26, Sept. 1. *Outer Hebrides*—Barra, April 19, two; Sept. 5, two. *Argyll and Isles*—Skerryvore, April 22, a rush; May 13, on rock; Sept. 8, a rush with Wheatears, etc. *Clyde*—Dailly, Ayrshire, April 9, a few.

Earliest, April 9, Dailly; latest, Sept. 9, Blair Atholl.

PHYLLOSCOPUS SIBILATRIX (Wood Wren).

Tay—Pitlochry, May 2; Tayfield, May 3. *Forth*—Rosslyn Glen, April 30, several; Dalmeny, May 2. *Tweed*—Halmyre, May 14; Chirnside, Sept. 1. *Clyde*—Giffnock, May 1.

Earliest, April 30, Rosslyn.

ACROCEPHALUS PHRAGMITIS (Sedge Warbler).

Tay—Fordoun, April 18, arrived; Tayfield, May 3, first seen. *Forth*—Morningside, May 8; Roslin, Aug. 7. *Tweed*—Halmyre, April 25. *Argyll and Isles*—Skerryvore, May 13, on rock. *Clyde*—Thornliebank, May 1.

Earliest, April 18, Fordoun.

LOCUSTELLA NÆVIA (Grasshopper Warbler).

Forth—Aberfoyle, May 8. *Clyde*—Carluk, May 3.

CINCLUS MELANOGASTER (Black-bellied Dipper).

Shetland—Dunrossness, Nov. 27, shot on shore of Loch Spiggie; new to Shetland.

C. AQUATICUS (Dipper).

Outer Hebrides—Barra, Nov. 27, one.

MOTACILLINÆ (Wagtails).

Shetland—Dunrossness, Aug. 27, *M. melanope* (Gray Wagtail), two on shore; *M. lugubris* (Pied Wagtail), April 30, along with other birds; Sept. 14, numerous. North Ronaldshay, Aug. 28, *M. melanope*, seven. *Dee*—Peterhead, March (second and third weeks), *M. lugubris*, numerous on migration; Sept. 5, very numerous; Sept. 19, passing S. *Tay*—Tayfield, March 6, *M. melanope*, first seen. *Tweed*—Chirnside, May 20, *M. alba* (White Wagtail). *Outer Hebrides*—Barra, April 30, *M. alba*; Sept. 15, young bird. *Argyll and Isles*—Skerryvore, May 15, *M. melanope*, on rock; Aug. 19, *M. lugubris*, flying about rock; Sept. 9, *M. melanope*, killed at light. Dhuheartach, Aug. 18, *M. lugubris*, many passing; Sept. 8-9, many with other small birds. Tiree, April 19, *M. alba*, several; April 16, many passing N.; Aug. 24 and Sept. 7, returning S. *Clyde*—Kenmuir, April 2, *M. alba*. Cambuslang, April 24-25, *M. flava* (Blue-headed Wagtail), a single bird seen on both dates—*M. raii*, *alba*, *lugubris*, and *melanope* also noted. April 17, *M. raii*; Sept. 10, a few. Lamlash, March 24, *M. lugubris*, first arrival.

ANTHUS TRIVIALIS (Tree Pipit).

Tay—Ballinluig, May 1; Blair Atholl, Sept. 15, one. *Forth*—Morton Hall, April 21, one. *Tweed*, Halmyre, April 28. *Clyde*—Beith, April 17.

Earliest, April 17, Beith.

ANTHUS PRATENSIS (Meadow Pipit).

Dee—Peterhead, Sept. 5, migrating numerously. *Argyll and Isles*—Skerryvore, April 13 and 15, several on rock; April 22, a rush of small birds; Aug. 18, many at midnight at lantern, "rare occurrence so early"; Aug. 24, at lantern with Larks, etc.; Sept. 18, at lantern till daylight. *Dhuheartach*, Sept. 8 and 9, a rush of small birds; Sept. 12 and 13, many at lantern.

ORIOULUS GALBULA (Golden Oriole).

Tay—Arbroath, June 8, adult ♂ obtained ("Annals," 1898, p. 179).

LANIUS EXCUBITOR (Great Gray Shrike).

Clyde—Harleyholm, Dec. 14, 1897, one seen ("Annals," 1898, p. 48). *Solway*—St. Mary's Isle, Oct., one obtained ("Annals," 1899, p. 110).

LANIUS COLLURIO (Red-backed Shrike).

Dee—Ratray Head, May 22, at shore station. *Tay*—Arbroath, May 21, a pair seen. *Forth*—Innerwick, May 25, adult ♂.

AMPELIS GARRULUS (Waxwing).

Moray—Findhorn Links, Nov. 4, 1897, ♀; Tomintoul, Nov. 13, ♂ and ♀; Cairngorm, Nov. 24, a pair, ♂ and ♀ ("Annals," 1898, p. 50). *Clyde*—Riccarton Moss, Jan. 22, two; a flock of seven seen near Loch Lomond ("Annals," 1898, pp. 115-116).

MUSCICAPA GRISOLA (Spotted Flycatcher).

Shetland—Dunrossness, May 20, a good many. *Dee*—Ratray Head, May 22, a ♂. Peterhead, May 23, first seen; Aug. 15, last. *Tay*—Fordoun, Sept. 3, left. *Forth*—Duchray, May 9; Dalmeny Park, May 13, Sept. 4. *Tweed*—Chirside, May 23, Sept. 4; Halmyre, May 7. *Clyde*—Beith, May 5; Queen's Park, Glasgow, Sept. 21.

Earliest, May 5, Beith; latest, Sept. 21, Queen's Park, Glasgow.

MUSCICAPA ATRICAPILLA (Pied Flycatcher).

Shetland—Dunrossness, April 30, adult ♂ picked up, "new to Shetland" ("Annals," 1898, p. 178). *Tay*—Fordoun, May 11, one seen, exhausted; May 20, one; May 22, one. *Forth*—Innerwick, May 18, a ♂; May 24, a ♀.

HIRUNDO RUSTICA (Swallow).

Orkney—Pentland Skerries, May 15, first; North Ronaldshay, May 20, two. *Dee*—Ratray Head, May 3, several, first of season.

Peterhead, April 24, a few; Sept. 27, last seen. *Tay*—Fordoun, April 18, arrived; Aug. 29, majority left; Sept. 11, resident birds left, but migrants passing on to Oct. 8. *Tayfield*, April 6, first seen. *Forth*—Colinton, April 8; Dalmeny, April 10, Nov. 7, 13, and 19. *Tweed*—Broughton, April 17, arrived; Nov. 7, one passing. Chirnside, April 16; Oct. 19, last seen. *Outer Hebrides*—Island Ghlais, March 19, one; Barra, May 3. *Argyll and Isles*—Skerryvore, May 18, two; Tiree, May 16, seen. *Clyde*—Lamlash, April 30, first; Turnberry, April 25, three; Lendalfoot, April 2; Carmichael, Oct. 12, a flock. *Solway*—Mull of Kintyre, April 28, four.

Earliest, March 19, Island Ghlais; latest, Nov. 19, Dalmeny.

CHELIDON URBICA (House Martin).

Orkney—Pentland Skerries, Sept. 13, one. *Tay*—Fordoun, May 3, arrived; Sept. 29, remnant left. Ballinluig, April 30. *Forth*—Duchray, May 3. *Tweed*—Halmyre, April 28, several; Chirnside, Oct. 10. *Clyde*—Lamlash, April 30, several; Thornliebank, April 28.

Earliest, April 28, Halmyre and Thornliebank; latest, Oct. 10, Chirnside.

COTILE RIPARIA (Sand Martin).

Forth—Dalmeny, April 9. *Tweed*—Chirnside, April 16, first seen; Oct. 10. *Clyde*—Carmyle, April 16, numerous.

Earliest, April 9, Dalmeny; latest, Oct. 10, Chirnside.

FRINGILLINÆ (Finches and Linnets).

Shetland—Mealy Redpoll, Dunrossness, Oct. 20, one captured alive, first time observed; Nov. 11, one shot; Nov. 25, three seen. Redpolls, North Unst, Oct. 10, five killed at lantern; other birds observed till end of month. Siskin, Dunrossness, Feb., a few; June 4, a ♂. Chaffinch, April 30, many in rush; Oct. 21, first of season. *Sutherland*—Goldfinch, Berridale, Caithness, March 4, one bird, rare. *Dee*—Greenfinch, Peterhead, Oct. 29, rush with Chaffinches and Bramblings. *Tay*—Brambling, Fordoun, Feb. 26, a flock. Siskin, Oct. 25, over 100, Tayfield; March 14, Comerton Wood, Tentsmuir. Mealy Redpoll and Lesser Redpoll, March 14, Tentsmuir. *Forth*—Goldfinch, Dalmeny, Jan. 1, three; Dec. 10, three. Lesser Redpoll, Row, Doune, Jan. 2, a flock of 25; Edgelaw, Oct. 8, a few. Brambling, Isle of May, Oct. 6, large flock at lantern; Swanston, Oct. 13, one. *Tweed*—Brambling, Broughton, Oct. 23, one; Halmyre, Nov. 6, small flocks; Chirnside, April 10; last seen, Oct. 15, large flock. *Outer Hebrides*—Brambling, Barra, Oct. 11, eleven remained for a week or two. Chaffinch, Oct. 18. Mealy Redpoll, Nov. 10, one. *Argyll and Isles*—Chaffinch, Skerryvore,

Nov. 27, two on rock; Dhuheartach, Oct. 19-20, in rush, several killed; Nov. 9, flocks all night at light. Greenfinch, Tiree, Jan. 27. Brambling, Dec. 12, a large flock on the island from this date onwards. "Not recorded in 'Fauna of Argyll.'" *Clyde*—Brambling, Carmichael, Jan. 31; Oct. first week, very plentiful. *Solway*—several flocks seen in district during March.

Principal movements, Oct. 19-20, Nov. 9.

COCCOTHAUSTES VULGARIS (Hawfinch).

Forth—Arniston, March 9, adult ♀ picked up. A young bird captured at same place on Aug. 3, 1894 ("Annals," 1898, pp. 114-115).

LOXIA CURVIROSTRA (Crossbill).

Shetland—Dunrossness, Sept. 30, one. *Tay*—Fordoun, July 23, family parties. *Tweed*—Halmyre, Nov. 6, small flock.

EMBERIZA HORTULANA (Ortolan Bunting).

Shetland—Dunrossness, April 30, adult ♂ obtained, another bird seen, "first record" ("Annals," 1898, p. 178).

PLECTROPHENAX NIVALIS (Snow Bunting).

Shetland—Dunrossness, Oct. 31, large flocks; North Unst, Nov. 3, large flock, a few killed at lantern. *Orkney*—Pentland Skerries, March 16, none seen after this date; Oct. 7, flock. North Ronaldshay, Oct. 23, about 100. *Sutherland*—Cape Wrath, March 7, small flock; Oct. 27, first of season; Nov. 17, several at lantern. *Forth*—Gullane, Oct. 26, one; Isle of May, Nov. 28, a few. *Outer Hebrides*—Island Ghlais, Nov. 30, a flock, "few birds seen this year." *Argyll and Isles*—Skerryvore, Aug. 18, midnight, at lantern with Pipits, "rare occurrence so early"; Dhuheartach, Nov. 20, at light; Ben Nevis Observatory, July 20, a young bird brought in by cat. *Clyde*—Queen's Park, Glasgow, March 3, about twelve, last for season. Carmichael, March 28, a bird seen in summer plumage; September 16, one captured.

Principal movements, Oct. 31, Nov. 1-8.

STURNUS VULGARIS (Starling).

Orkney—Pentland Skerries, Oct. 21, with Fieldfares and Thrushes. *Dee*—Rattray Head, Oct. 20, striking lantern, also Thrushes and Redwings. *Argyll and Isles*—Skerryvore, March 20, at lantern, other birds striking; Oct. 7 and 8, many flying round light and resting in the windows, S.E. gale. Skervuile, Oct. 19, great many killed, with Thrushes and Blackbirds; Nov. 8, with Redwings. *Clyde*—Turnberry, Feb. 13, rush. *Solway*—Mull of Kintyre, Nov. 9, rush of birds.

GARRULUS GLANDARIUS (Jay).

Solway—Lockerbie, Nov. 5, one shot, a drove frequenting the woods at Closeburn. Large flocks in Annandale and Nithsdale ("Annals," 1898, pp. 49, 181-182).

CORVIDÆ (Crows and Rooks).

Shetland—Dunrossness, Rooks, Oct. 25, flock passing S. *Sutherland*—Cape Wrath, Crows, Nov. 3 and 4, all day. *Tay*—Tayfield, Hooded Crow, May 3, large numbers, very unusual at this season. *Dee*—Peterhead, Oct. 24, in large numbers, first of season. *Argyll and Isles*—Dhuheartach, Jackdaw, Oct. 22; Nov. 9, rested on tower. Tiree, Rook, Nov. 26, flock.

ALAUDA ARVENSIS (Skylark).

Orkney—Pentland Skerries, Oct. 7, killed at light. *Forth*—Isle of May, Oct. 12, a few at lantern. *Argyll and Isles*—Skerryvore, March 22, killed at lantern; Aug. 24, many at lantern; Sept. 12, flying about light with other small birds; Oct. 19, a rush, many striking; Nov. 19, great rush with other birds. Dhuheartach, Oct. 19, a rush all night with other birds; Nov. 9, great numbers at light. *Solway*—Mull of Kintyre, Nov. 9, in rush with other birds.

Principal movements, Oct. 19, Nov. 9 and 19.

CYPSELUS APUS (Swift).

Sutherland—Scormelate, June 1. *Dee*—Peterhead, May 17, first; Sept. 20, last. *Tay*—Fordoun, May 16, arrived; Aug. 20, left. Tayfield, May 6, first. *Forth*—Murrayfield, May 14; Edinburgh, Sept. 29. *Tweed*—Halmyre, May 10, 20 or so; Chirnside, May 14-Aug. 15. *Clyde*—Crookston, Hangingshaw, Beith, May 3. Earliest, May 3, Clyde; latest, Sept. 29, Edinburgh.

CAPRIMULGUS EUROPÆUS (Nightjar).

Forth—Dalkeith Park, May 5; Dryden Glen, Aug. 18. *Clyde*—Lamlash, April 23.

IYNX TORQUILLA (Wryneck).

Shetland—Foula, April 30, one captured ("Annals," 1898, p. 182).

DENDROCOPUS MAJOR (Great Spotted Woodpecker).

Sutherland—Scots Calder, Sept. 30; Auchingill, Oct. 19; Tongue, Oct. 22; Wick, Nov. 4. *Moray*—Pluscarden, Nov. 10, one, a few others seen in district. *West Ross*—Nigg, Oct., one; Braemore, seen daily, Dec. to March; Invertael, one. *Dee*—Aberdeen, Oct. 8, one; Nov. 12, one. Peterhead, Oct. 29, two young birds; Glen-

bervie, Oct. 27, three. *Tay*—Newport, Oct. 21, young bird; Arbroath, Oct. 22; Forfar, Oct. 26; Tayfield, Dec. 30, seen. *Forth*—Row, Doune, Oct. 18, one; Thurston, Oct. 27, immature ♂; Broxmouth Park, Oct. (last week), one; Newington, Nov. 7; Inch, Nov. 9; Aberlady, Nov. 15; Dalmeny, Nov. 15 and 16, Dec. 16. *Tweed*—Halmyre, May 15; Chirnside, Oct. 14, one. Nested at Duns Castle; Hawick, Oct. 18, immature ♂. Melrose, Oct. 21, seen; Burnfoot, Oct. 14. *Solway*—Procured at St. Mary's Isle in Oct.

CUCULUS CANORUS (Cuckoo).

Tay—Fordoun, May 1, first; Ballinluig, May 1. *Forth*—Aberfoyle, April 25; Dalmeny, May 1. *Tweed*—Halmyre, April 23; Broughton, April 30. *Outer Hebrides*, Barra, April 28. *Argyll and Isles*—Tiree, May 17; Ben Nevis Observatory, May 23, found dead in snow about 4300 feet. *Clyde*—Turnberry, May 6, first heard; Lamlash, April 28, first heard; Beith, April 20.

Earliest, April 20, Beith.

ALCEDO ISPIDA (Kingfisher).

West Ross—Sept. 10, on river Broom for about three weeks, "very rare."

UPUPA EOPS (Hoopoe).

Forth—Isle of May, April 30, one; Dunbar, Oct. 17 or 18, one.

STRIGIDÆ (Owls).

Shetland—Foula, Long-eared Owl, Oct. 29, during heavy gale; Dunrossness, Short-eared Owl, April 30, two. *Orkney*—Pentland Skerries, Short-eared Owl, Oct. 20, one; North Ronaldshay, Snowy Owl, June 7, one. *Sutherland*—Scotscalder, Nov. 19, two. *Dee*—Aberdeen, European Hawk Owl, Nov. 21, a ♀ ("Annals," 1899, p. 49). *Argyll and Isles*—Dhuheartach, Nov. 9, in rush of birds; Tiree, Short-eared Owl, Jan. 22, several.

FALCONIDÆ (Falcons and Hawks).

Shetland—Iceland Falcon, April 6, immature ♂, Sept. (last week), one shot ("Field," Oct. 15). Dunrossness, Osprey, May 2, one fishing in Loch Spiggie. *Dee*—Honey Buzzard, Sept. 15, a young bird shot at Kinmundy. *Tay*—Tayfield, Buzzard, Jan. 22, one. Merlin, Oct. 12, three seen on migration, "not resident here." *Forth*—Rough-legged Buzzard, Oct. 22, one shot, Broxmouth Woods; Nov. 12, 14, 19, three from Lammermoors. *Tweed*—Broughton, Buzzard, Sept. 25, one seen; Halmyre, Peregrine, Sept. 15, a ♂ seen. *Outer Hebrides*—Barra, Greenland Falcon, March 8, single bird seen. *Solway*—Dumfries, Marsh Harrier, shot early in May at Kirkmichael ("Annals," 1898, p. 182).

ANSERINÆ (Geese).

Shetland—Dunrossness, *A. cinereus* (Graylag Goose), Oct. 20, one. *Forth*—Aberlady, Oct. 4, flock of 23. *Tay*—Tayfield, *A. brachyrhynchus* (Pink-footed Goose), May 1, large flock, last seen; Oct. 7, six, first seen. *Outer Hebrides*—Barra, *Bernida leucopsis* (Bernacle Goose), Oct. 17, seven, first; *B. brenta* (Brent Goose), Nov. 9, two; *A. albifrons* (White-fronted Goose), Nov. 9, four. *Argyll and Isles*—Dhuheartach, *B. leucopsis*, Nov. 15, three; Tiree, *A. albifrons*, May 4, travelling N.

CYGNINÆ (Swans).

Orkney—Pentland Skerries, *C. bewicki* (Bewick's Swan), Feb. 23, flying N.W. *Outer Hebrides*—Barra, *C. musicus* (Whooper), Jan. 2, eight flying S.; Dec. 3, St. Clair's Loch. *Argyll and Isles*—Tiree, *C. bewicki*, March 3, have left, numerous all winter; Nov. 12, returned, over 40 seen. *C. musicus*, March 3, left; Nov. 8, returned.

ANATIDÆ (Ducks).

Shetland—Noss, *Harelda glacialis* (Long-tailed Duck), June 30, ♀, Dunrossness; *Mareca penelope* (Wigeon), Sept. 10, four, Loch Spiggie, first. *Orkney*—North Ronaldshay, *M. penelope*, March 17, one; *Fuligula marila* (Scaup Duck), Sept. 10, four. *Moray*—*A. strepera* (Gadwall), Feb. 4, Loch Spynie. *Dee*—Peterhead, *M. penelope*, Sept. 26, arrived in numbers; Rattray Head, *H. glacialis*, Oct. 17, large flock, first; Aberdeen, *A. strepera*, Oct. 22, four shot at Pitfour; *Q. circia* (Garganey), Oct. 22, seven shot at Pitfour ("Annals," 1899, p. 50); Rattray Head, *Mergus serrator* (Merganser), Oct. 3, several, first; *F. ferina* (Pochard), Oct. 17, first flock; Oct. 20, one struck lantern. *Tay*—Fordoun, *C. glaucion* (Golden-eye) Oct. 21, one. *Forth*—*C. glaucion*, May 14, eight, Loch Leven; *F. ferina* (Pochard), June 16, a ♂, Lochend. *Dafila acuta* (Pintail), several pairs (6 or 7) nesting on Loch Leven ("Annals," 1898, p. 162-164). Isle of May, *Tadorna cornuta* (Sheld Duck), Sept. 22, two killed at lantern. *Outer Hebrides*—Barra, *H. glacialis*, Oct. 17, about 200; *C. glaucion*, Nov. 14, two. *Argyll and Isles*—Dhuheartach, *M. penelope*, Nov. 9, killed at light. Tiree, *D. acuta*, Jan. 13; *Spatula clypeata* (Shoveller), April 9, a pair; *M. penelope*, April 18, have left; *A. strepera*, April 30, "still here"; Oct. 23, have returned; *M. albellus* (Smew), July 30, one at sea; Nov. 14, Gort Bay. *Clyde*—Gartcosh, *S. clypeata*, April 11, three pairs; May 21, one pair, Little Loch; *M. penelope*, June 2, one pair, Lochend Loch; May 2, one pair, Mearns; *C. glaucion*, April 9, five, Glen Dam; Oct. 9, four, Balgray Dam; *F. cristata*, April 30, about 70, Gartcosh Lochs; *F. marila*, Aug 13, three, Balgray Dam. Carmichael, *F. ferina*, Nov. 24, one shot, first noted for district.

COLUMBA PALUMBUS (Ring Dove).

Shetland—Dunrossness, April 30, one; Oct. 31, one. *Outer Hebrides*—Barra, April 24, one.

TURTUR COMMUNIS (Turtle Dove).

Argyll and Isles—Dhuheartach, Sept. 28, one rested on rock.

CREX PRATENSIS (Land Rail).

Sutherland—Banniskirk, June 1. *Dee*—Peterhead, April 30. *Tay*—Fordoun, May 26; Oct. 22, one shot. *Tayfield*, May 6, first. *Forth*—Cramond, April 24; Falkland, May 4; Oct. 25, one, Pathhead. *Tweed*—Broughton, April 23; Halmyre, April 23; Chirnside, Sept. 4. *Outer Hebrides*—Barra, May 4. *Argyll and Isles*—Skerryvore, May 21, on rock, first seen; Tiree, May 5. *Clyde*—Giffnock and Beith, April 23. *Solway*—Mull of Kintyre, May 10, one.

Earliest, April 23, Broughton, Halmyre, Giffnock, and Beith.

RALLUS AQUATICUS (Water Rail).

Shetland—Dunrossness, Nov. 30, one. *Sutherland*—Nov. 15, killed at Dorrery. *Forth*—Dec. 8, one shot, Dalmeny Park.

PORZANA MARUETTA (Spotted Crake).

Forth—Oct. 18, at Dunbar Station ("Annals," 1899, p. 50).

PORZANA BAILLONI (Baillon's Crake).

Sutherland—Sept. 13, killed at Westfield ("Annals," 1899, p. 50).

HOUBARA MACQUEENI (Macqueen's Bustard).

Dee—Aberdeen, Oct. 24, ♀, immature, St. Fergus, Pitfour, first Scottish record ("Annals," 1899, pp. 51, 73).

EUDROMIAS MORINELLUS (Dotterel).

Tay—Sept. 7, small flock on hills north of Glen Tilt.

CHARADRIUS PLUVIALIS (Golden Plover).

Orkney—North Ronaldshay, June 29, three seen. *Sutherland*—Forsinard, June 2, flocking. *Dee*—Peterhead, Oct. 11-12, flights coming in. *Argyll and Isles*—Skerryvore, April 18, one killed at lantern; April 22, several flying round light. Tiree, March 24, very large flocks travelling N.; Sept. 17, enormous flocks; Oct. 7, 18, other rushes.

PHALAROPUS FULICARIUS (Gray Phalarope).

Argyll and Isles—Dhuheartach, Sept. 12, one. *Tay*—Tayfield, Dec. 1, one at mouth of Tay.

PHALAROPUS HYPERBOREUS (Red-necked Phalarope).

Shetland—Foula, Aug. 28, leg and wing sent.

SCOLOPAX RUSTICULA (Woodcock).

Shetland—Dunrossness, Oct. 10, one. *Orkney*—North Ronaldshay, Nov. 11, one killed at lantern; Pentland Skerries, Nov. 28, one. *Forth*—Isle of May, Nov. 24, numerous at lantern. *Outer Hebrides*—Island Ghlais, Nov. 19, one killed at light. *Argyll and Isles*—Skerryvore, Nov. 20, many wounded birds on the rock from rush last night. Dhuheartach, Oct. 20, killed at light, rush of birds; Oct. 30, one killed. Tiree, Oct. 17, several; Nov. 26, a few.

GALLINAGO MAJOR (Great Snipe).

Moray—Oct. 15, shot at Pitgaveny ("Annals," 1899, p. 51).

GALLINAGO GALLINULA (Jack Snipe).

Tay—Tayfield, Sept. 30, one. *Argyll and Isles*—Skerryvore, Oct. 22, six; Tiree, Oct. 10.

TRINGA SUBARQUATA (Curlew Sandpiper).

Argyll and Isles—Tiree, Sept. 23, one, first appearance in Tiree ("Annals," 1899, p. 46). *Clyde*—Balgray Dam, Sept. 25, Oct. 23.

TRINGA CANUTUS (Knot).

Forth—Aberlady Bay, May 26, one in red plumage; July 21, one; Aug. 30, flock of 70, mostly young. *Outer Hebrides*—Barra, Sept. 16, several.

CALIDRIS ARENARIA (Sanderling).

Forth—Dalmeny, Aug. 16. Aberlady Bay, Aug. 30, a score, mostly young; Oct. 11. *Argyll and Isles*—Tiree, Jan. 24, very numerous on ebb at Gott Bay. *Clyde*—Turnberry, Sept. 25, two.

MACHETES PUGNAX (Ruff).

Shetland—Dunrossness, Sept. 17, Reeve shot. *Clyde*—Balgray Dam, Sept. 25, Oct. 23.

TOTANUS HYPOLEUCUS (Common Sandpiper).

Dec—Peterhead, Sept. 21, only one of season seen. *Tay*—Tayfield, May 1, first seen. *Forth*—Bavelaw, April 17, first of

season. *Tweed*—Broughton, April 11, arrived. *Outer Hebrides*—Barra, April 27, one. *Argyll and Isles*—Dhuheartach, Sept. 28, two. *Clyde*—Lamlash, April 21, a pair; Uddingston, April 16, numerous; Dalbeth, Sept. 10.

Earliest, April 11, Broughton.

TOTANUS FUSCUS (Spotted Redshank).

Clyde—Balgray Dam, Oct. 16 and 30 ("Annals," 1899, pp. 51-52).

TOTANUS CANESCENS (Greenshank).

Orkney—North Ronaldshay, Sept. 13, three. *Forth*—Aberlady, July 19, one. *Tweed*—Roxburgh, Sept. 23, one. *Argyll and Isles*—Tiree, Aug. 13, several.

LIMOSA LAPPONICA (Bar-tailed Godwit).

Forth—Aberlady, July 16, a few. *Argyll and Isles*—Tiree, Jan. 28, two small flocks. *Clyde*—Bute, June 3, nineteen (three in breeding plumage); St. Ninian's Bay, Turnberry, Sept. 25, one.

NUMENIUS PHÆOPUS (Whimbrel).

Orkney—North Ronaldshay, Aug. 4, six. *Forth*—Aberlady, July 13, two; Morningside, Aug. 8, one, midnight, passing W.; Dalmeny, Aug. 5; Longniddry, Oct. 11, a ♀. *Argyll and Isles*—Tiree, April 29, plentiful; May 6, in hundreds. *Clyde*—Lendalfoot, May 1; Lamlash, Aug. 2, one.

STERNINÆ (Terns).

Orkney—Pentland Skerries, "Terns," May 13, first. *Dee*—Ratray Head, "Terns," May 1, first; Peterhead, *S. fluviatilis*, (Common Tern), May 9, numerous; Ratray Head, "Terns," Aug. 20, left. *Forth*—*S. cantiaca* (Sandwich Tern), May 7, two, Canty Bay. *S. minuta* (Lesser Tern), Aug. 14, Dalmeny. *Outer Hebrides*—Barra, *S. macrura* (Arctic Tern), May 18. *Argyll and Isles*—Skerryvore, "Terns," Sept. 16, two at lantern. Tiree, *S. fluviatilis*, May 3, arrived; *S. macrura*, May 13, arrived; *S. minuta*, May 14, arrived; "Terns," Sept. 25, have left. *Clyde*—Lamlash, "Terns," Sept. 4, last seen.

LARINÆ (Gulls).

Shetland—Dunrossness, *L. glaucus* (Glaucous Gull), Nov. 4, one. *Outer Hebrides*—Barra, *L. glaucus*, March 21, one. *Argyll and Isles*—Dhuheartach, *L. leucopterus* (Iceland Gull), Nov. 6, one. *Solway*—*Pagophila eburnea* (Ivory Gull), seen Aug. 3, and again on following morning ("Zoologist" (4), vol. ii. p. 414).

STERCORARIUS POMATORHINUS (Pomatorhine Skua).

Forth—Portobello, Oct. 19, one; Oct. 28, one picked up after gale. *Solway*—Oct. 26, one shot between Annan and Gretna; Nov. 1, another ditto ("Annals," 1899, p. 52).

PODICIPEDIDÆ (Grebes).

Shetland—Dunrossness, *P. fluviatilis* (Little Grebe), Nov. 24, one. *Tay*—Tayfield, *P. auritis* (Sclavonian Grebe), Dec. 1, at mouth of Tay. *Outer Hebrides*—Barra, *P. auritis*, April, adult ♂. *Argyll and Isles*—Tiree, *P. auritis*, Oct. 29, several.

FULMARS GLACIALIS (Fulmar).

Shetland—Noss, June 30, nesting for first time; Saxaford, July 4, in three localities, "have never seen this breeding haunt recorded"; Hermaness, July 5, in three localities, have bred here for four or five years—"ascertained that they were on Papa Stour also" (R. Godfrey).

ON THE OCCURRENCE IN SCOTLAND OF
ANDRENA RUFICRUS, NYL. (A BEE NEW
TO THE BRITISH LIST), AND OTHER RARE
ACULEATE HYMENOPTERA.

By WILLIAM EVANS, F.R.S.E.

ANDRENA RUFICRUS, Nylander, "Mon. Apum Bor.,"
p. 217 (1847).

At Aberfoyle, S.W. Perthshire, towards the end of April 1896, I noticed a small bee, belonging to the genus *Andrena*, in some numbers on dandelion flowers, and took three specimens (all males unfortunately) for identification. On submitting these to Mr. Edward Saunders, F.L.S., a few months ago, I received from him the welcome intelligence that they were referable to Nylander's *Andrena ruficrus*, a species new to the British list, though well known in Sweden and some other parts of the Continent. It appears to be one of the earliest of spring bees, and should be looked for

during the first fine weather in April. Schmiedeknecht ("Apidæ Europææ") says: "In Europa septentrionali et centrali primo vere volat sed haud frequenter." Mr. Saunders has kindly sent me, for incorporation in this note, copy of a diagnosis of the species which he has drawn up for publication in the July number of the "Entomologists' Monthly Magazine." The description of the male is taken mainly from one of the Aberfoyle specimens, and that of the female from a Continental example.

♂ black; apex of and sometimes the entire posterior tibiæ and the posterior metatarsi ferruginous; head densely clothed with long white hairs, intermixed on the sides of the face and on the vertex with black ones; antennæ with the 3rd joint slightly longer than the 4th, 4th and 5th subequal; mandibles simple at the base; head and thorax dull, with the surface rugulose and shallowly punctured, the latter and legs clothed with grayish-white hairs; propodeum finely rugose; wings almost clear, nervures testaceous; abdomen with a fine alutaceous surface, with very vague shallow scattered punctures, apices of the segments with a few white hairs more abundant laterally; apex of abdomen and segments beneath clothed with whitish hairs.

♀ black; posterior tibiæ and metatarsi bright ferruginous; face clothed with pale fulvous hairs, margined with black at the sides; 3rd joint of the antennæ rather longer than the 4th and 5th together; thorax clothed with fulvous hairs, those of the under side much paler, surface dull, finely rugulose and punctured; posterior tibiæ and tarsi clothed with bright fulvous hairs; abdomen rather shining, finely alutaceous, the bases of the segments with a fine, shallow, rather remote puncturation, the apical margins narrowly piceous, clothed with a few pale hairs at the sides; apical fimbria brownish, apices of the segments beneath fringed with pale hairs.

Length, 8-10 mm.

Mr. Saunders adds: "The ♂ looks like a small *Clarkella*, as Nylander remarks, or a *præcox*. The former may be known at a glance by the longer 3rd antennal joint, the latter by the large mandibular tooth. *Ruficrus* should follow *angustior* in our list."

OSMIA PARIETINA, *Curt.*

In September 1898, when searching for Coleoptera on a hillside near Blair Atholl, Perthshire, I discovered, at an elevation of 1000 to 1300 feet, several clusters of bee-cells or cocoons attached to the under sides of stones. One stone had about 50 on it. About half of the cocoons were open and empty, the occupants having emerged; but many were still closed, and on opening a couple I found in each, in a torpid state, a small reddish bee, which Mr. Edward Saunders has since identified for me as the rare *Osmia parietina* of Curtis, a species which has not been recorded from any part of Britain for many years. From some cocoons which I brought home with me a dozen bees of both sexes, but all dead, and two living Chrysidids—apparently *Chrysis hirsuta*, Gerst.—were extracted this spring. *O. parietina* was first taken by Curtis about seventy years ago at Ambleside, on the banks of Windermere, in Westmoreland. In November 1849, a flat stone, having on its under side 230 cocoons, was next discovered at Glen Almond, Perthshire, and sent to the British Museum. When found, about one-third of the cocoons were empty, and from the others perfect insects appeared at intervals during the spring and summer of the following year, while a few remained over till June 1852 (Smith's "Cat. Brit. Hymenoptera in Brit. Mus.," 2nd ed., 1876, p. 150). The species has also been captured at Rannoch (prior to 1855) and in Wales.

NOMADA BOREALIS, *Zett.*

On 26th April 1897 I found this species common on a bank beside a footpath near Dollar, Clackmannanshire, where there was a colony of *Andrena clarkella*, upon which it is parasitic. In England it seems to be widely distributed, though usually rare, but I am not aware of any previous record for Scotland. Mr. Saunders, who has seen one of my specimens, predicted its occurrence, however, in his recent work on the Hymenoptera Aculeata of the British Islands.

DIPTERA SCOTICA : I.—PERTHSHIRE.

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

(Continued from p. 91.)

Family TACHINIDÆ.

124. ECHINOMYIA GROSSA, *Linn.*—Methven Moss, August 1894 (M'Gregor); Methven Moss, 5th September 1896 (Wylie).
125. THRYPTOCERA BICOLOR, *Mg.*—Falls of Bruar, 10th September 1898 (Evans).
126. NEMORÆA RUDIS, *Flu.*—Glenfarg, May 1894 (M'Gregor).
127. OLIVIERIA LATERALIS, *Fab.*—Stanley, August 1896 (M'Gregor); Kinfauns Woods, 18th July 1896 (Wylie).

Family DEXIDÆ.

128. DEXIA CANINA, *Fab.*—Methven Wood, 18th July 1898 (Wylie).

Family SARCOPHAGIDÆ.

129. SARCOPHAGA CARNARIA, *Linn.*—Kinfauns Woods, 27th August 1896 (Wylie).
130. SARCOPHAGA MELANURA, *Mg.*—Kinfauns Woods, 1896 (Wylie).
131. CYNOMYIA MORTUORUM, *Linn.*—Methven Moss, April 1894 (M'Gregor); Glenfarg, May 1894 (M'Gregor).

Family MUSCIDÆ.

132. LUCILIA CORNICINA, *Fab.*—Methven Moss, April 1894 (M'Gregor); Almond Valley, August 1894 (M'Gregor); Fenderbridge, September 1898 (Evans).
133. LUCILIA CÆSAR, *Linn.*—Methven Moss and Woody Island, June 1894 (M'Gregor); Kinnoull, 8th August 1896 (Wylie).
134. CALLIPHORA GRENLANDICA, *Ztt.*—Dalguise, May 1894 (M'Gregor); Kinnoull, 1896 (Wylie); Fenderbridge, September 1898 (Evans).
135. CALLIPHORA ERYTHROCEPHALA, *Mg.*—Kinnoull, 29th August 1896 (Wylie).
136. CALLIPHORA VOMITORIA, *Linn.*—Kinnoull, 1896 (Wylie).
137. CALLIPHORA (ONESIA) SEPULCHRALIS, *Mg.*—Fenderbridge, September 1898 (Evans).

138. POLLENIA VESPILLO, *Fab.*—Dalguise, May 1894 (M'Gregor); Fenderbridge, September 1898 (Evans).
139. POLLENIA RUDIS, *Fab.*—Almond Valley and Methven Moss, April 1894 (M'Gregor); Kinfauns, April 1897 (Wylie); Fenderbridge, September 1898 (Evans).
140. PYRELLIA LASIOPHTHALMA, *Mcq.*—Kinfauns, April 1897 (Wylie).
141. MESEMBRINA MERIDIANA, *Linn.*—Dalguise and Glenfarg, May 1894 (M'Gregor); Almond Valley, August 1894 (M'Gregor); Kinnoull, 15th August 1896 (Wylie).
142. MORELLIA HORTORUM, *Fln.*—Kinnoull, 1896 (Wylie).
143. CYRTONEURA PABULORUM, *Fln.*—Kinfauns Woods, 1896 (Wylie).

Family ANTHOMYIDÆ.

144. POLIETES LARDARIA, *Fab.*—Fenderbridge, September 1898 (Evans).
145. HYETODESIA LUCORUM, *Fln.*—Kinfauns, April 1897 (Wylie).
146. HYETODESIA MARMORATA, *Ztt.*—Scone, July 1897 (Wylie).
147. HYETODESIA DISPAR, *Fln.*—Almond Valley, May 1894 (M'Gregor).
148. HYETODESIA BASALIS, *Ztt.*—Kinnoull, 1896 (Wylie); Fenderbridge, September 1898 (Evans).
149. HYDROTÆA IRRITANS, *Fln.*—Falls of Bruar, 10th September 1898 (Evans).
150. OPHYRA LEUCOSTOMA, *Wied.*—Kinnoull Hill, 9th July 1898 (Wylie).
151. DRYMEIA HAMATA, *Fln.*—Kinnoull, 1896 (Wylie).
152. HYDROPHORIA CONICA, *Wied.*—Fenderbridge, September 1898 (Evans).
153. HYLEMYIA STRIGOSA, *Fab.*—Falls of Bruar, 10th September 1898 (Evans).
154. CÆNOSIA GENUALIS, *Rond.*—A small *Cænusia*, which I take to be this rare species, was captured by Mr. Evans at Fenderbridge, September 1898.

Family CORDYLURIDÆ.

155. NORELLIA SPINIMANA, *Fln.*—Scone, July 1897 (Wylie).
156. SCATOPHAGA LUTARIA, *Fab.*—Kinnoull, 1896 (Wylie).
157. SCATOPHAGA STERCORARIA, *Linn.*—Almond Valley, April and August 1894 (M'Gregor); Methven Moss, April 1894

(M'Gregor); Dalguise, May 1894 (M'Gregor); Woody Island and Kinnoull Hill, June 1894 (M'Gregor); Kinnoull, 18th July 1896 (Wylie); Kinfauns, June 1897 (Wylie); Scone, July 1897 (Wylie).

Family HELOMYZIDÆ.

158. *TEPHROCHLAMYS RUFIVENTRIS*, *Mg.*—Fenderbridge, September 1898 (Evans).

Family SCIOMYZIDÆ.

159. *DRYOMYZA ANILIS*, *Fln.*—Kinnoull, 1st August 1896 (Wylie); Kinfauns, June 1897 (Wylie).
 160. *DRYOMYZA FLAVEOLA*, *Fab.*—Glenfarg, May 1894 (M'Gregor); Kinfauns, June 1897 (Wylie).
 161. *SCIOMYZA ALBOCOSTATA*, *Fln.*—Kinnoull Hill, June and July 1897 (Wylie).
 162. *TETANOCERA ELATA*, *Fab.*—Kinnoull Hill, June 1894 (M'Gregor); Kinnoull, 1896 (Wylie).
 163. *TETANOCERA FERRUGINEA*, *Fln.*—Kinfauns, June 1897 (Wylie).
 164. *TETANOCERA PUNCTULATA*, *Scop.*—Kinnoull Hill, June 1894 (M'Gregor); Scone, July 1897 (Wylie).
 165. *LIMNIA UNGUICORNIS*, *Scop.*—Scone, July 1897 (Wylie); Fenderbridge, September 1898 (Evans).

Family PSILIDÆ.

166. *PSILA FIMETARIA*, *Linn.*—Perthshire, 1894 (M'Gregor); Kinnoull Hill, June and July 1897 (Wylie).
 167. *PSILOSOMA LEFEBVRII*, *Ztt.*—A male and female of this rare species were taken by Mr. Wylie at Methven Moss on 28th August 1896 (see "Annals," 1897, p. 24).

Family MICROPEZIDÆ.

168. *CALOBATA PETRONELLA*, *Linn.*—Scone, July 1897 (Wylie).

Family ORTALIDÆ.

169. *PTEROPÆCTRIA FRONDESCENTIÆ*, *Linn.*—Scone, July 1897 (Wylie).

Family TRYPETIDÆ.

170. *ACIDIA COGNATA*, *Wied.*—Scone, July 1897 (Wylie).
 171. *TRYPETA ONOTROPES*, *Lw.*—Scone, July 1897 (Wylie).
 172. *TEPHRITIS MILIARIA*, *Schrk.*—Kinnoull, 8th July 1896 (Wylie).

173. *TEPHRITIS LEONTODONTIS*, *Deg.*—Methven Moss, June 1894 (M'Gregor).
174. *EUARESTA CONJUNCTA*, *Lw.*—Almond Valley, May 1894 (M'Gregor); Woody Island, May and June 1894 (M'Gregor); Perth Nurseries, 1896 (Wylie); Scone, July 1897 (Wylie); Falls of Bruar, 10th September 1898 (Evans).

Family LONCHÆIDÆ.

175. *PALLOPTERA UMBELLATARUM*, *Fab.*—Scone, July 1897 (Wylie).
176. *PALLOPTERA SALTUUM*, *Linn.*—Kinfauns and Kinnoull, June 1897 (Wylie).
177. *PALLOPTERA ARCUATA*, *Fln.*—Glenfarg, May 1894 (M'Gregor); Woody Island, May and June 1894 (M'Gregor); Kinfauns and Kinnoull, June 1897 (Wylie); Kinnoull Hill, July 1898 (Wylie).

Family SAPROMYZIDÆ.

178. *SAPROMYZA DECEMPUNCTATA*, *Fln.*—Fenderbridge, September 1898 (Evans).
179. *SAPROMYZA RORIDA*, *Fln.*—Kinnoull Hill, June 1894 (M'Gregor); Methven Moss, 28th August 1896 (Wylie).
180. *LAUXANIA ÆNEA*, *Fln.*—Woody Island, June 1894 (M'Gregor).

Family OPOMYZIDÆ.

181. *BALIOPTERA COMBINATA*, *Linn.*—Kinfauns and Kinnoull, June 1897 (Wylie).
182. *OPOMYZA GERMINATIONIS*, *Linn.*—Kinfauns and Kinnoull, June 1897 (Wylie).

Family BORBORIDÆ.

183. *BORBORUS NITIDUS*, *Mg.*—Kinfauns, June 1897 (Wylie).
184. *BORBORUS EQUINUS*, *Fln.*—Perthshire, 1894 (M'Gregor).
185. *BORBORUS GENICULATUS*, *Mcq.*—Perthshire, 1894 (M'Gregor).

Family HIPPOBOSCIDÆ.

186. *LIPOPTENA CERVI*, *Linn.*—A single male of this interesting species was taken by Mr. Evans at Aberfoyle on the 11th September 1897.

TOPOGRAPHICAL BOTANY OF SCOTLAND.

By JAMES W. H. TRAIL, A.M., M.D., F.R.S.

(Continued from p. 103.)

[Names of plants in *italics*, except as synonyms within curved brackets, denote that the plants were *certainly* introduced into Scotland by man. † after a district-number denotes introduction by man into the district; "cas." denotes casual occurrence, and "esc." evident escape or outcast from cultivation, both being due to man's agency. Square brackets enclosing the name of a plant or a district-number denote that the record was made in error. ? after a district-number denotes, at least, need of confirmation; after † it denotes doubt as to whether the plant owes its presence in the district to man.]

ARISTOLOCHIACEÆ.

Asarum europæum, L., 75†, 83†, 84†, 85†.

THYMELEACEÆ.

Daphne Mezereum, L., 74†, 75†, 83†.*D. Laureola*, L., 74†, 75†, 77†, 81†, 83†, 85†, 86†, 87†, 89†, 91†.

ELÆAGNACEÆ.

Hippophae rhamnoides, L., 72†, 73†, 74†, 75†, 82†, 83†, 84†, 85†, 90†, 91†, 92†, 97†, 98†, 101†, 102†, 106†, 108†.

LORANTHACEÆ.

Viscum album, L., 89†, 90†.

EUPHORBIACEÆ.

Euphorbia Helioscopia, L., all; usually a weed of cultivated fields.*E. amygdaloides*, L., 72†.*E. Paralias*, L., 74, 85†.*E. portlandica*, L., 74, 84†, 85†.*E. Peplus*, L., *except* 78, 101, 106, 108; usually as a garden weed, suggestive of introduction.*E. exigua*, L., 72-75, 77, 80, 81, 83, 85, 87-90, 94, 100.*E. Lathyris*, L., casual, in Perthshire.*Buxus sempervirens*, L., a casual outcast or escape.*Mercurialis perennis*, L., *except* 107, 110, 112.*M. annua*, L., 75†, 83†, 85†, 86†, 87†, 90†.

URTICACEÆ.

Ulmus montana, Stokes, *except* 80, 93, 94, 111, 112. No doubt this occurs in *all* the counties, but in at least the northern ones it has probably been planted. Its natural distribution in Scotland cannot now be determined.

U. suberosa, *Stokes*, reported from 72-77, 80, 81, 83, 86, 87, 90, 91; doubtless in most counties, but doubtfully indigenous in Scotland.

Humulus Lupulus, *L.*, 72-77, 80, 81, 83, 85-92, 95-97. There is no sufficient reason to regard the hop as indigenous anywhere in Scotland, though recorded from some districts without comment. In most habitats its introduction is evident.

Urtica dioica, *L.*, all. This certainly owes its wide diffusion, if not its introduction into Scotland, to man's indirect aid.

b. angustifolia, *A. Blytt*; occasional.

U. urens, *L.*, *except 98*. Even more suggestive than *U. Dioica* of man's assistance.

¹ *Parietaria officinalis*, *L.*, 73-79, 81-83, 85-87, 90, 91†, 92†, 93†, 94†, 95†, 96†, 99, 100†, 106†.

MYRICACEÆ.

Myrica Gale, *L.*, *except 78, 80, 81, 82, 112*.

CUPULIFERÆ.

² *Betula alba*, *agg.*, *except 110, 112*.

B. verrucosa, *Ehrh.*, 72-74, 76, 77, 85, 87-89, 91, 92, 95, 96, 100, 101, 105, 106, 108, 109.

B. pubescens, *Ehrh.*, 72-74, 76, 77, 80, 87-89, 91, 92, 96-100, 102, 104, 105, 107, 111.

B. intermedia, *Thomas*, 92, 108.

B. nana, *L.*, 77 (?), 78, 81 (?), 88-90, 92, 94, 95 (?), 96-98, 105, 106, 108.

Alnus glutinosa, *L.*, *except 110†, 111†, 112*.

Carpinus Betulus, *L.*, recorded from 72, 73, 75-78, 81, 83, 85-88, 90-92, 95, 100, 101, 103, but probably nowhere indigenous.

³ *Corylus Avellana*, *L.*, *except 112*.

⁴ *Quercus Robur*, *L.*, *except 75, 79, 109, 110†, 111, 112*.

a. pedunculata (*Ehrh.*), 72-74, 76-78, 80, 82, 83†, 84, 85†, 86-89, 91, 92, 95-99.

¹ *Parietaria officinalis*, *L.*, is restricted, at least in the north of Scotland, to old masonry. Probably the sign † should be more freely used than it has been; but only a knowledge of the habitats can determine this for each district.

² *Betula alba*, *L.*—The forms included under the aggregate are not sufficiently distinguished in local lists to permit of indicating their distribution satisfactorily.

³ *Corylus Avellana*, *L.*—The abundance of nuts in peat-bogs of the northern counties shows that the Hazel was formerly plentiful where it is now extinct or much restricted, *e.g.* in the Hebrides and Orkney.

⁴ *Quercus Robur*, *L.*—That this is native in the Highlands is shown alike by the remains in peat-bogs, and by the frequency of the Gaelic name in the names of places. Probably it has been introduced into every district in which it was not already native. In Aberdeenshire, and elsewhere in the north, the fruits seldom grow large or ripen. The varieties have not been distinguished in a good many districts in which they doubtless occur.

b. intermedia (*D. Don*), noted in "Flora of Perthshire" as "widely distributed."

c. sessiliflora (*Salisb.*), 73, 74, 76-78, 81, 85†, 86-89, 91, 92, 95-97, 99, 105, 108.

Castanea sativa, *Mill.*, not uncommon, but only where introduced, *e.g.* in 72-74, 86, 88-92.

Fagus sylvatica, *L.* Probably in almost every district, though not actually recorded from 79, 99, 105, 108, 109, 110, 111, 112. Though wide spread and abundant, and often occurring in habitats where not planted by man, H. C. Watson regards it as not indigenous anywhere in Scotland. It is, however, thoroughly established in many localities.

MONOCOTYLEDONES.

Elodea canadensis, *Michx.* (= *Anacharis Alsinastrum*, *Bab.*), in ponds and backwaters, often abundant, 74-77, 83, 84, 86-93, 99, 100, 111.

Stratiotes aloides, *L.*, introduced into ponds in 83, 84, "Perthshire," 90.

Malaxis paludosa, *Sw.*, 72-75, 85-88, 90-92, 95-100, 104-108, 110.

Corallorhiza innata, *R. Br.*, 75 (?), 81, 83, 85, 87-92, 96, 105, 106.

Neottia Nidus-avis, *Rich.*, 72, 73, 75-77, 79-92, 94, 96, 98, 99.

Listera cordata, *R. Br.*, *except* 78, 84, 103.

L. ovata, *R. Br.*, *except* 78, 112.

Goodyera repens, *R. Br.*, 75, 80, 81, 84, 88-97, 105-108.

Cephalanthera ensifolia, *Rich.*, 75, 83, 85, 88, 89, 97, 98, 100, 103, 105.

[*C. pallens*, *Rich.* = *C. grandiflora*, *S. F. Gray*, has been recorded for 88, 98, 100, in error?]

Epipactis latifolia, *All.*, 72, 73, 75-77, 80-84, 86-90, 92, 94, 95 (?), 98, 100, 103, 108.

E. violacea, *Bor.* (= *E. purpurata*, *Sm.*), 84 (?)

E. atrorubens, *Schultz.*, 89, 108.

E. palustris, *Crantz.*, 81-83, 85, 87-89, 104 (?).

Orchis pyramidalis, *L.*, 72-74, 81, 85, 102, 103.

[*O. Morio*, *L.*, has been recorded from 83 and 111, in error.]

O. mascula, *L.*, *except* 78, 107.

O. latifolia, *L.*, aggregate, all; probably this may be taken as *maialis*, which form has been recorded by name only from 72-74, 79, 82-86, 88-90, 96, 97, 106-109.

O. incarnata, *L.*, 72, 74, 79, 80, 82, 84, 86-93, 96-98, 102-106, 108-111.

Orchis maculata, *L.*, *except* 80, where it doubtless occurs.

Habenaria conopsea, *Benth.* (= *Gymnadenia conopsea*, *R. Br.*), *except* 78, 82, 110.

- H. albida*, *R. Br.*, except 78, 79, 80, 81, 82, 83, 84, 103, 110.
H. viridis, *R. Br.*, except 78, 80.
H. bifolia, *R. Br.*, aggregate, except 78, 701, 111, 112.
H. bifolia, *R. Br.*, segregate, except 78, 79, 93, 101, 111, 112.
H. chloroleuca, *Ridley* (= *H. chlorantha*, *Bab.*), except 78, 93, 94, 95, 96, 107, 109, 111, 112.
Iris foetidissima, *L.*, as an introduction in 73-75, 87.
I. pseudacorus, *L.*, all.
Crocus vernus, *All.*, "alien," in 75.
C. nudiflorus, *Sm.*, escape, in 72.
Narcissus pseudo-narcissus, *L.*, not native in Scotland, but recorded as more or less fully naturalised, or as an escape, in 72, 74-77, 81, 83, 85, 86, Perthshire, 90-93, 95, 98, 99.
(*N. poeticus*, *L.*, an occasional escape or casual.)
Galanthus nivalis, *L.*, like *N. pseudo-narcissus*, occurring in 73, 75, 76, 86, Perthshire, 92, 99, 102.
Ruscus aculeatus, *L.*, not indigenous in Scotland apparently, 72, 73, 75-77, 83, 85, 95, 99, 102.
Asparagus officinalis, *L.*, naturalised or escape on sea-shore, 73, 82.
Polygonatum verticillatum, *All.*, doubtful if anywhere indigenous in Scotland, very local, 72, 88, 89, 90.
P. multiflorum, *All.*, doubtfully indigenous anywhere in Scotland, often an evident escape, 72, 75-77, 82, 83, 85-88, 90-92, 95.
P. officinale, *All.*, very doubtful as indigenous in Scotland, 89 (?), 102.
Convallaria maialis, *L.*, often an escape or introduction, and usually recorded as such, but believed by *Dr. White* to be indigenous in 87-89, and by *Dr. Gordon* to be so in 96; also recorded for 90 from "one native locality." Other records are 73†, 75, 76, 77, 82†, 83†, 85†, 86†, 94†, 95†, 99, 109†.
Allium Scorodoprasum, *L.*, 73, 74, 77†, 81, 85, 88†, 89†, [90], 96†.
A. vineale, *L.*, 72-75, 77, 79, 81, 83-86, 88-93, 99, 100, 102.
A. oleraceum, *L.*, 72, 81, 85, 88-91, 95, 105 (?).
A. carinatum, *L.*, an escape or introduction in 73, 88, 89.
A. Schœnoprasum, *L.*, casual or introduced in 77, 81, 83, 85, [98].
A. ursinum, *L.*, except 78, 95, 111, 112.
Scilla verna, *Huds.*, 73-75, 81, 93-95, 101-104, 108-112.
S. festalis, *Salisb.* (= *S. nutans*, *Sm.*), all; but introduced into 110, 111, 112.
Ornithogalum umbellatum, *L.*, more or less naturalised in 72, 74, 75, 83, 85, 86, 92, 102.
Lilium pyrenaicum, *Gouan* } "aliens" in 75.
L. Martagon, *L.* }
Fritillaria Meleagris, *L.*, in 75†, *fide* "Top. Bot.," ed. 2.
Tulipa sylvestris, *L.*, rare introductions in 83, 84, 85, *fide* *Sonntag*.

- Gagea fascicularis*, *Salisb.* (= *G. lutea*, Ker), 73, 77 (?), 80, 83, 84, 85 (? extinct), 88, 89, 90 (?), 92, 95, 96.
- Colchicum autumnale*, L., casual, or error; reported from 83, 87.
- Narthecium ossifragum*, L., *except* 78, 82.
- Tofieldia palustris*, *Huds.*, 72 (?), 86-90, 92, 94, 95 (?), 96-99, 104, 105, 108, 109.
- Paris quadrifolia*, L., 72, 73 (escape in both, *fide* Scott-Elliott, but in 8 localities), 75-77, 83, 85-92, 94, 96, 109.
- Veratrum nigrum*, L., "alien" in 75.
- Juncus bufonius*, L., all.
var. β fasciculatus, Koch, common in Perthshire, also in 98, 105.
- J. trifidus*, L., 72, 86-90, 92, 94, 96-100, 104-108, 111 (?), 112.
- J. squarrosus*, L., all.
- J. compressus*, Jacq., 75 (probably needs confirmation), 80 (?), 89 (?), 99, 105 (?).
- J. Gerardi*, *Loisel.*, *except* 78, 79, 80.
- J. tenuis*, *Willd.*, 73, 76, 86, 92 *cas.*, 97, 99. There is some doubt as to whether this rush has not been introduced from America.
- J. balticus*, *Willd.*, 73 (?), 85, 90-96, 106, 108-110.
- J. filiformis*, L., 91, 99.
- J. glaucus*, *Leers.*, *except* 84, 92, 94, 95, 96, 98, 99, 101, 102, 103, 104, 105, 106, 107, 109, 110, 111 (?), 112.
- J. effusus*, L., all.
- J. effusus* × *glaucus*, 77, [85], 87, [91], 101, 105.
- J. conglomeratus*, L., all.
- J. maritimus*, *Lam.*, 72-77, 84, 85 (?), 86, 91, 95-97, 99-102.
- [*J. acutus*, L., has been recorded from 73, probably in error.]
- J. supinus*, *Mench.*, *except* 79, 80.
var. Kochii, *Bab.*, has been recorded from Perthshire, 97, 103-105, 107.
var. fluitans, *Fr.*, recorded from 72 (?), 74 (?), Perthshire, 105.
- J. obtusiflorus*, *Ehrh.*, 73-76, 77 (?), 82, 83 (?), 84 (?), 90 (?).
- J. lampocarpus*, *Ehrh.*, *except* 80.
var. nigrifellus, *Don*, has been recorded from 105.
- J. alpinus*, *Vill.*, 88, 89, 96, 98, 102, 108.
- J. acutiflorus*, *Ehrh.*, *except* 80.
- J. castaneus*, *Sm.*, 72 (?), 87, 88, 90, 92, 97-99.
- J. biglumis*, L., 87, 88, 98, 104, [recorded, in error, also from 86, 89, 90, 92, 94, 97, 100].
- J. triglumis*, L., 72 (?), 86-90, 92, 94, 96-101, 104, 105, 108, 111, 112.
- Luzula Forsteri*, *DC.*, 75, 90 (?), [109].
- L. vernalis*, *DC.*, *except* 78, 79, 104.

- L. maxima*, DC., except 78.
var. gracilis, Rostrup., 112.
- L. albidata*, DC., recorded as an escape or introduction in 72, 88, 89.
- L. arcuata*, Sw., 89 (? in "Top. Bot.," not known to Dr. White), 90 (?), 92, 94, 96, 108.
- L. spicata*, DC., 86-90, 92, 94, 96-98, 104-110, 112.
- L. campestris*, DC., except 79.
- L. erecta*, Desv. (= *L. multiflora*, Lej.), except 93, 106, 108; no doubt occurs in these also.
var. congesta, Koch, 72-77, 86-92, 97-101, 103-105, 108, 109, 111.
var. sudetica, Reichb., reported from Perthshire (but not known as native by Dr. White), 98, 111.
- Typha latifolia*, L., may be indigenous in some localities, but noted as introduced in other districts; 72-77, 79† (?), 80-84, 85† (?), 86-89, 90† (?), 92†, 93†, 100† (?), 106, 109, 111† (?). Probably should oftener be queried as native.
var. media, Syme, recorded from 75 (Kilmaurs) in Smith's "Botany of Ayrshire."
- T. angustifolia*, L., 72, 73, 75, 77, 83, 85, 86, 106.
- Sparganium ramosum*, Huds., except 101.
var. microcarpum, Neuman, 88, 103, 110.
- S. neglectum*, Beeby, 98.
- S. simplex*, Huds., except 78, 82, 84, 97, 104, 107, 110.
- S. affina*, Schnizl., except 76, 77, 78, 90, 103, 107.
- S. minimum*, Fr., except 78, 80, 81, 82, 84, 85, 93, 94, 95, 106, 110, 111.
- Arum maculatum*, L., 72-77, 79-81, 83, 84, 85†, 86, 87†, 88†, 90†, 92†, 94†, 95†, 99, 100, 102, 109†. Probably a good many more vice-counties should have †.
- Acorus Calamus*, L., an introduction in 72, 73, 75, 76, 77, 86.
- Lemna trisulca*, L., 75, 77†, 80, 81, 82 (?), 83, 85, 86, 88† (?), 90, 91, 94.
- L. minor*, L., except 78, 107, 108, 112.
- L. gibba*, L., 75, 77†, 83-86, 109.
- L. polyrrhiza*, L., 77, 83, 84.
- Alisma Plantago-aquatica*, L., except 78, 97, 104, 105, 107, 108, 109, 110, 111, 112.
- A. ranunculoides*, L., except 78, 79, 82, 84, 86, 91, 94, 97, 98, 101, 105, 107, 108, 109, 111, 112.
- Elisma natans*, Buchenau, 74 (in "Top. Bot."), 75.
- Sagittaria sagittifolia*, L., introduced into 76, 77, 86.
- Butomus umbellatus*, L., 73, 83, 84, 88, 89. Regarded by Dr. White as native in Perthshire.
- Triglochin palustre*, L., all.
- T. maritimum*, L., except 78, 79, 80.

Scheuchzeria palustris, *L.*, 88 (apparently now extinct).

Potamogeton natans, *L.*, all.

var. *lanceolatus*, *Fieber*, 109, 111.

P. polygonifolius, *Pour.*, all.

var. *angustifolius*, *Fr.*, 109, 112 (approaching this var.)

P. coloratus, *Hornem.* (= *P. plantagineus*, *Du Croz*), 72, 79-82, 100, 112 (?), [98 and 109 have been also recorded for this, but probably erroneously].

P. alpinus, *Balb.* (= *P. rufescens*, *Schrad.*), except 79, 80, 91, 95, 96, 98, 104, 105, 107, 108, 110, 111, 112.

[*P. lanceolatus*, *Sm.*, has been recorded from 72 and 73, but in error, the plant being *P. nitens*.]

P. heterophyllus, *Schreb.*, except 80, 82, 84, 97, 99, 107.

var. *c. graminifolius*, *Fr.*, 109.

P. nitens, *Web.*, 72, 73, 80, 85, 86, 88-90, 92, 93, 95, 96, 98, 100, 102, 103, 105 (?), 106, 108, 109, 111, 112.

P. lucens, *L.*, 72, 75, 79-81, 83, 85-94, 98, 104, 108 (?), 110 (?), 111 [112, ? error].

P. decipiens, *Nolte*, 80, 81, 86, 88, 90, 102.

P. angustifolius, *Presl.* (= *P. Zizii*, *Roth.*), 72-74, 77, 79-81, 86-90, 99, 106.

P. praelongus, *Wulf.*, 73, 74, 75 (?), 80, 81, 83 (?), 85, 86, 88-90, 92, 95 (?), 96-98, 102-104, 106, 108, 109, 112.

P. perfoliatus, *L.*, except 78, 82, 101, 105.

var. *b. lanceolatus*, *Blytt*, 86, Sutherland, 112.

P. crispus, *L.*, except 87 (?), 96, 97, 98, 103, 104, 105, 107, 108, 112 (?).

var. *b. serratus*, *Huds.*, is reported in "Fl. Perth," p. 311, as "in several places in Perthshire."

P. densus, *L.*, 77, 80, 82, 83.

P. zosteræfolius, *Schum.*, 85 (?), 86, 89 (?), 90.

P. Bennettii, *Fryer*, 86.

P. obtusifolius, *Mert.* and *Koch*, 72, 73, 75, 77, 79-81, [83], 85-92, 96, [111].

var. *b. fluvialis*, *Lange* and *Mort.*, is the "common form in Perthshire."

P. Friesii, *Rupr.* (= *P. compressus*, *Sm.*), 73, 75, 77, 79 (?), 85, 86, 90, 99, 110, 111.

P. pusillus, *L.*, except 78, 104, 105, 107, 108.

var. *b. tenuissimus*, *Koch*, 88, 109.

var. *c. rigidus*, *Ar. Benn.*, 111, 112.

P. Sturrockii, *Ar. Benn.*, 86, 89.

P. pectinatus, *L.*, except 76, 77, 78, 79, 82, 88, 89, 91, 94, 97, 98, 99, 100, 101, 104, 105, 107.

P. interruptus, *Kit.* (= *P. flabellatus*, *Bab.*), 75, 80, 81, 83, 95, 99,

- P. filiformis*, *Nolte*, 75, 81, 83, 85, 88, 90, 96, 102, 103, 106, 108-112.
- Ruppia maritima*, *L.* (including the forms of *Ruppia* in Britain), has been recorded without precise indication of the form as below: 73-75, 82, 90, 91, 94-97, 101, 102, 109-112. In most it probably is *rostellata*.
- R. spiralis*, *Hartm.*, 73, 74 (?), 111, 112.
- R. rostellata*, *Koch*, 73, 75, 82, 91, 94-97, 99, 101-103, 105, 108, 110-112.
- var. *b. nana*, *Boswell*, 105, 106, 111.
- Zannichellia palustris*, *L.*, 75-77, 79-83, 85-88, 106, 111.
- Z. pedunculata*, *Reichb.*, 87 (?), 90, 110.
- Z. polycarpa*, *Nolte*, 111, 112.
- var. *b. tenuissima*, *Fr.*, 111.
- Zostera marina*, *L.*, 73-76, 82, 83, 85, 90, 91, 95-107, 109-111, 112 (not type).
- var. *b. angustifolia*, *Fr.*, 111, 112 (only form seen by W. H. Beeby).
- Z. nana*, *Roth.*, 73, 75, 90, 96, 98-100, 106, 107, [111].
- Naias flexilis*, *Rosk.* and *Schmidt*, 88, 89.
- Eriocaulon septangulare*, *With.*, 103, 104.

(To be continued.)

FURTHER NOTES ON SCOTTISH ROSES.

By WILLIAM BARCLAY.

IN the "Notes on Scottish Roses" which appeared in the "Annals" for April and July 1896 there will be found in the July part, pages 174-176, some remarks regarding a rose which M. Crépin calls "a very curious regional variety, which does not seem to be represented on the Continent," and which he hesitated to class under any known species. This rose, acting on a suggestion of M. Crépin, I shall in the sequel speak of by the name of *Rosa sub-coriifolia*.

In the season of 1896 I gathered specimens in flower, in most cases from bushes of which I had previously sent specimens in fruit. M. Crépin's report on these was as follows:—"The rose of which you have this year sent me numerous specimens in flowers or in fruits, and which you have already sent in 1894 and 1895, I have as yet been unable to determine, but it is extremely interesting.

“What is it in reality? After having examined it thoroughly, my opinion is that it is very near to *R. coriifolia*, Fr. If its sepals erected themselves on the fruits, I think I should not hesitate to identify it with *R. coriifolia*. Its general facies, its leaves, its wood are similar. Moreover, and this is a very important point, it appears to ripen quite as early as a *R. coriifolia* or *R. glauca*. If I were a Déséglise, I should not hesitate to make a new species of it ; but, according to the principles which guide me, it is not possible for me to see in this form—certainly a remarkable one—a veritable species. But, you will say, what do you make of it? Must one join it to *R. coriifolia* as a variety? That is perhaps the wisest thing to do until further light be cast upon it.

“The reflexion of the sepals certainly makes it difficult for us to identify it with *R. coriifolia*, to which we must add also the less important fact of the different colour of the petals.

“If you describe it as a new secondary species, do so with reserves, and make reserves also if you describe it as a variety of *R. coriifolia*. What appears to me certain is that it is not a variety of *R. canina*, L., or of *R. tomentella*, Lem. On the other hand, it is not any of the forms which Mr. Baker has described under the name of *R. arvatica*.

“As I have already said, I do not find on the Continent anything similar to it.

“It varies a little, whilst preserving its chief characters. Sometimes the sub-foliar glands are abundant, with the sepals profusely glandular on the edges, or scarcely at all glandular. Sometimes the sub-foliar glands are wanting or nearly so, or with only a few glands on the midrib. In two cases, the sepals are not only glandular on the edges, but also on the back, whilst one specimen has the pedicels also thinly glandular.

“In *R. coriifolia*, Fr., the fruits are usually rounded ; but in *R. sub-coriifolia* they are long and pyriform.

“In all your specimens the teeth are composite-glandular, both edges of the teeth having glandular toothlets.

“In fine, I repeat, this is an extremely interesting form, and one which deserves to be made the subject of a special

notice. In doing so, be careful to impress the fact that this is not the case of a single bush, but that the form occurs in different localities more or less distant from each other. When you write, tell me if it grows mixed with *R. coriifolia*. Do its bushes resemble those of this last species, or can one distinguish the one from the other at a distance?

“One might ask if *R. sub-coriifolia* may not be a hybrid; but I do not see what crossing could have produced it.”

It will be seen from the above that M. Crépin does not know very well what to make of *R. sub-coriifolia*. There is nothing about it which would lead me to consider it as a hybrid, apart from the difficulty of conceiving what the two species could be that produced it. In general appearance its bushes resemble those of *R. coriifolia*, except that, as a rule, its flowering branches are more elongate and drooping, and with much fewer prickles. It sometimes grows beside *R. coriifolia*, but sometimes also in company with other species. In 1897 M. Crépin sent me some further remarks on this form, but the substance of them is the same as that of the report given above. I may quote one or two sentences: “I have re-examined the fine collection which you sent me in 1895 and 1896 of this singular form, which has already so greatly embarrassed us. The new examination which I have made leaves me still perplexed as to the real nature of this rose.” “This strange form is known to me only by your gatherings. Had it already been observed before you? That is what I cannot tell.”

With regard to this last question, there are in the Herbarium of the Perthshire Society of Natural Science about a dozen specimens which have been named var. *arvatica*, Baker. About half of these are *R. sub-coriifolia*. The others, so far as I can make out from the specimens, some of which are very poor, belong to *R. coriifolia*, Fr. I believe that I have seen specimens with Mr. Kidston, gathered in Stirlingshire, and also named *R. arvatica*, Baker, which likewise belong to *R. sub-coriifolia*. I believe that all the specimens from Perthshire which have been named var. *arvatica*, Baker, belong either to *R. coriifolia* or to *R. sub-coriifolia*. Anxious, if possible, to obtain more light as to *R. sub-coriifolia*, I sent to Mr. Baker at Kew a series

of specimens with flowers and fruit, and asked him to give his opinion regarding them. He very kindly examined them and wrote me saying that in his opinion they belonged to a little-known form, his variety *incana*, which is the same as *R. tomentosa*, Sm., var. *incana*, Woods, and *R. cæsia*, Sm., var. *incana*, Borrer. In confirmation of his opinion, he referred me to Borrer's description in the "British Flora," ed. iii. p. 242, and also to the type specimen in Woods' numbered collection, deposited in the Herbarium of the Linnean Society in authentication of his monograph.

Borrer's description of the var. *incana* does not agree in several points with the characters of *R. sub-coriifolia*. As regards the reflexion of the sepals, he says of var. *incana*: "The sepals spread widely, or even become recurved after flowering." In *R. sub-coriifolia*, the sepals become closely reflexed (appressed to the fruit) after flowering. Some of them spread a little just as the fruit is ripening, and rarely one or two may become erect; but on the whole they continue closely reflexed till they drop off. Then as regards the fruit, he describes that of var. *incana* as almost equally large at both ends. The fruit of *R. sub-coriifolia* is almost always thickest above the middle, and narrowed below. Knowing, however, the difficulty of judging critical forms from even the most accurate description, I was desirous to see the type specimen in Woods' collection. A few months ago, a short visit to London enabled me, through the kindness of the officials of the Linnean Society, to gratify this desire.

The specimen No. 59 of Woods' collection, named by him var. *incana* of *R. tomentosa*, Sm., is rather a poor one on which to found even a variety. It contains only one very immature fruit. In the manuscript notes which are deposited along with the collection Woods says: "Sent from Mr. G. Don to Mr. Sabine. I have not only seen no other plant, but this is the only specimen of the fruit which has come under my notice."

After a careful examination of the specimen, such as it is, I am unable to coincide with Mr. Baker's opinion that var. *incana* and *R. sub-coriifolia* are the same. Woods' plant appears to me to be certainly a form of *R. coriifolia*, Fr., belonging to the same group as var. *Watsoni*, Baker. Borrer was, I

think, perfectly right in making it a variety of *R. cæsia*, Sm., in regard to which I shall have something to say further on.

Without attempting in the meantime to define the exact position of *R. sub-coriifolia* further than to say that there can be no doubt that it is more nearly allied to *R. coriifolia*, Fr., than to any other species or sub-species, I submit the following description of it, drawn from the study of a considerable series of specimens from different and pretty widely separated localities in Perthshire.

R. sub-coriifolia.—Bush varying from four or five to seven or eight feet in height, usually having the flowering branches more elongated and less erect than in *R. coriifolia*.

Prickles rather thinly scattered, uncinatè with lengthened base, often nearly wanting on the flowering branches.

Leaves usually very glaucous in hue. Leaflets five or seven, the lower smaller, and all set close together; the terminal varying in shape and breadth, usually ovate or oval, acute or somewhat obtuse at the point, at the other end rounded or wedge-shaped, upper surface glabrous or glabrescent, lower hairy, chiefly on the ribs. Serratures copiously compound and beset with glands. Petioles downy and more or less glandular.

Stipules broad, with lengthened acute divaricate points, more or less downy on the back, the edges fringed with glands, which sometimes are spread more or less thickly over the dorsal surface.

Bracts large, twice the length of the peduncle, similar in clothing to the stipules but more rarely glandular.

Peduncles short, about $\frac{3}{10}$ of an inch long, less than half the length of the fruit, glabrous.

Flowers solitary, or up to four in a cluster, very pale pink.

Fruit fully $\frac{3}{4}$ of an inch long, less than half an inch at its broadest part, which is above the middle, narrowed below, obovate or pyriform. Styles hairy, forming a rounded mass.

Sepals rather longer than the fruit, the main ones pinnate with usually rather slender pinnæ, downy on the back, the edges more or less fringed with glands, which sometimes extend to the dorsal surface, *closely reflexed after flowering*, disarticulating as the fruit reddens, which occurs about *the last week of August or the first week of September*.

Differs from *R. coriifolia* by the flowering branches more elongate and with fewer prickles, by the shape of the fruit, and especially by the sepals not becoming erect.

It is to be noted that there is a certain amount of variation amongst the different specimens. The leaflets may be more or less glandular on the under surface, or eglandular; the petioles, backs of the stipules, and backs of the sepals may also be with or without glands, and in one case the peduncles also are glandular. Though the flowers are wonderfully uniform in colour,—a very pale pink,—in one case they are as deeply coloured as they commonly are in *R. coriifolia*. The amount of villosity also varies, both as regards the under surface of the leaflets and the backs of the stipules.

In the "Revision des Rosa de l'herbier Babington," which appeared in the Journal of Botany for 1896, M. Crépin says that though he had not seen authentic specimens, he had reason to believe that *R. cæsia*, Sm., is a variety of *R. coriifolia*, Fr. The specimen in Woods' collection, No. 78, which bears on the label "*R. cæsia*, Sm., Taynult, Mr. Borrer," is undoubtedly a form of *R. coriifolia*, Fr., with slightly compound glandular tothing, and with the pedicels and backs of the sepals eglandular. In the Herbarium of the Natural History Department at South Kensington I found a specimen similar in all respects, also labelled "*R. cæsia*, Sm., Taynult, W. Borrer, June 1810?"

In the same collection may be seen another specimen named *R. cæsia*, Sm., and with the following interesting note pasted on the sheet: "*Rosa (cæsia, if new)*.—Highland valleys of Perthshire and Argyllshire. Bush compact, not so tall as *R. canina*, covered in July with a profusion of flowers, which are usually solitary, sometimes in pairs, generally of an uniform but very beautiful carnation hue (like that of *R. collina* in English Botany) occasionally white. Calyx sometimes sprinkled with glands, sometimes not. Young twigs and germen remarkably cæsious."

This note is not signed, but underneath is written in pencil "W. Borrer."

Below are the words: "From Sowerby's Herbarium. Recd. 1859."

This specimen, which is in flower, is also incontestably

a form of *R. coriifolia*, Fr., but differs from the two previously mentioned in having the pedicels and backs of the sepals thinly glandular. In the Kew Herbarium is a similar specimen labelled "Taynuilt—H. C. D. Turner."

Besides these type specimens, there were both at Kew and at South Kensington other specimens gathered in various parts of England by various collectors, and named *R. cæsia*, Sm. In most cases these were, I think, forms of *R. coriifolia*, Fr., but several of them were, in my judgment, forms of *R. tomentosa*, Sm.

In the "Revision des Rosa de l'herbier Babington," M. Crépin says that *R. pruinosa*, Baker, is also probably a variety of *R. coriifolia*, Fr. Mr. Baker, in his paper, identifies with his var. *pruinosa* those forms of *R. cæsia*, Sm., which have the pedicels eglandular, for he quotes *R. cæsia*, Borrer, "Brit. Flora," edit. 3, page 242 (*ex parte*). If so, then the two type specimens of *R. cæsia*, Sm., which I have mentioned first, would be classed as var. *pruinosa*; and, as I have said, these are, in my opinion, forms of *R. coriifolia*. At Kew I did not see any specimens named var. *pruinosa*. At South Kensington there were two bearing that name, both gathered in 1884 by E. F. Linton: one in Braemar, the other in Glen Shee. The first is *R. coriifolia*, with composite-glandular tothing and leaflets glandular below; the other is similar, but without glands on the under surface of the leaflets.

It would appear then that M. Crépin is right in saying that var. *pruinosa*, Baker, is a variety of *R. coriifolia*, Fr. I may add that No. 77 of Woods' collection, gathered near Edinburgh by Mr. Borrer and described in the "British Flora" as *R. Borreri*, Woods, var. β , appears to me to be likewise a form of *R. coriifolia*, Fr., with composite-glandular tothing and leaflets glandular below.

The uncertainty which has so long prevailed regarding *R. cæsia*, Sm., and its variety *incana*, Woods, has undoubtedly resulted from the fact that the specimens on which they were founded exist only in flowers or in immature fruit. Had authentic specimens existed showing the mature fruit, the identity of these with *R. coriifolia*, Fr., must have been long ago perceived. *R. coriifolia* is very abundant in Scotland, and its variations are manifold. These have been grouped

by M. Crépin under six heads in the "Revision des Rosa de l'herbier Babington," and also in the "Notes on Scottish Roses" which appeared in this journal in 1896. Many of these variations, gathered in Scotland, generally in immature condition, have been wrongly named. The following, for example, which I saw in the Herbarium at South Kensington, are all forms of *R. coriifolia*: *R. arvatica*, Baker, near Kincaig, Inverness, A. Somerville; *R. tomentella*, Lem., near Kincaig, and another from West Kincaig, A. Somerville; *R. obtusifolia*, Desv., Braemar by Clunie side, E. F. Linton.

OBSTACLES TO THE PROTECTION OF BIRDS' EGGS IN SCOTLAND.

FOR several years past letters similar to the ones reproduced below, and emanating from the same source, have been received by ornithologists resident in Scotland, and also by Scottish lighthouse-keepers. It will be observed that the desiderata include *several clutches* of *all* the species which it is most important should be (and in most counties are) protected, as well as eggs which are covered by the game laws.

[Copy]

SUFFOLK, 15th June 1898.

DEAR SIR—Are you collecting birds' eggs or Lepidoptera? If so, do you care to consider an exchange of duplicates with me? I can offer, taken in Great Britain and Ireland, Kestrel, Sparrow Hawk, Dipper, Nightingale, Redstart, Whinchat, Chiffchaff, Great Tit, Ray's Wagtail, Titlark, Tree Pipit (*in great variety*), Skylark, Tree Sparrow, Redpole, Linnet, Bullfinch, Chough (*many*), Carrion Crow, Rook, Cuckoo (*with Pied Wagtail, Sedge Warbler, Redbreast*), Kingfisher, Stock Dove, Turtle Dove, Pheasant, Red Grouse, Partridge, Lapwing, Sandpiper, Snipe, Heron, Landrail, Razorbill, Guillemot, Gannet (*many*), Terns (Common and Lesser), Gulls (Black-headed, Herring, and Great Black-backed), Manx Shearwater, Storm Petrel, and *nearly all* our commoner species. Also (but not British taken) Bee-eater, Glossy Ibis, various Herons, Dwarf Shag, Crab Plover, etc. etc. Of local Macro-Lepidoptera I have many to spare, besides large numbers of *nearly all* the common species. Also Colonella (now emerging in numbers from my humble-bees' nests) and Sticticalis. Also (Coleoptera) one hundred or more Chrysomela distinguenda *not* pinned. On the next page I give what I want, full separate clutches taken only in Great Britain, Ireland, or Faroe, with satisfactory data,

every egg absolutely perfect, even as to edges of drilled hole. Eagles (both), Osprey, Hobby, Merlin, Kite, Honey Buzzard, Harriers (all three), Owls (except Tawny), Pied Flycatcher, Redwing, Fieldfare, Ring Ousel, Stonechat, Warblers (Marsh, Grasshopper, Dartford, Wood), Tits (Marsh and Crested), Rock Pipit, Woodlark, Buntings (Snow and Cirl), Brambling, Goldfinch, Siskin, Twite, Crossbill, Raven, Lesser Spotted Woodpecker, Swift, Rock Dove, Capercaillie, Black Grouse, Ptarmigan, Quail, Golden Plover, Dotterel, Kentish Plover, Greenshank, Ruff, Dunlin, Woodcock, Whimbrel, Spotted Crake, Gadwall, Shoveller, Wigeon, Teal, Garganey, Scoter, Divers (all three), Black Guillemot, Roseate Tern, Great Skua, Leach's Petrel. Two or more clutches of any of these, and one good clutch of each of Cormorant and Great Crested Grebe. No small clutches wanted (*e.g.*, *not* three Woodcock, three Dunlin). I fear I have named some that are hardly obtainable even if you have them to spare, unless you want several clutches of Chough.—
Yours truly, [Signed] F. NORGATE.

[Copy]

SUFFOLK, 23rd March 1899.

DEAR SIR,—Do you collect birds' eggs? If so, do you care to consider an exchange of duplicate *clutches* with British, Irish, or Faroe data with me? I can spare many good clutches of Chough (Irish), Sparrow Hawk, Kestrel, Kingfisher, Nightingale, Redstart, Linnet, Corncrake, Heron, Red-legged Partridge, Snipe; Great Black-backed, Herring, and Black-headed Gulls; Tern, Gannet, Manx Shearwater, Storm Petrel, and nearly *all* our commoner species with British data. Also most of the rarer (foreign taken) species in the British list, and several exotic species. If you collect you may be able to supply me with several species of local North British birds that I still want, and I would send you a full list of all I can spare and of all I want, if you desire it.—Yours truly,

[Signed] F. NORGATE.

P.S.—If you think there is a chance of an exchange, I may say at once that I want a clutch or two, of not less than four eggs each, of Crossbill, fresh taken, *not* blown. I do not object to three or four days' incubation, but they must not be near hatching, and must be offered *this* month (not later). I would send a specially padded box filled with felt, with one hole for each egg. I mention this want only because March is nearly over and I do not want them to be taken later. [Signed] F. N.

PROSECUTION UNDER THE WILD BIRDS PROTECTION ACTS.—In May last, a woman named Brown was fined, in Aberdeen Sheriff Court, £1, or seven days' imprisonment, for inciting boys to collect Lapwings' eggs (for which she paid them a penny apiece) after 15th April. It came out at the trial that her husband was a regular

dealer in eggs, and had this year alone dispatched upwards of two tons of *Lapwings'* eggs to London.

DESTRUCTION OF OSPREYS.—We regret to learn that Ospreys have been destroyed during the present season in the counties of Argyll and Aberdeen. It is satisfactory to know, however, that both cases are being investigated with a view to the prosecution of the offenders.

ZOOLOGICAL NOTES.

Pied Flycatcher in S.E. Scotland.—We are informed that the Pied Flycatcher (*Muscicapa atricapilla*) has been unusually abundant as a bird of passage this season. Unfortunately, the details are not forthcoming in some instances. It was first reported from Ravelston, near Edinburgh, on 10th May, where a male was seen by Mr. A. O. Curle. A male was observed at Tynninghame on the 12th, where, on the 14th, no less than eleven were noticed in different places by Mr. Christopher C. Tunnard. In the "Scotsman" for 23rd May, it is stated that three of these birds were observed "the other day" between Ayton and St. Abb's. Lastly, an adult male was picked up dead towards the middle of June in the remote island of Foula, Shetland, and sent for identification by Mrs. Traill of Edinburgh and Foula.—EDS.

The Pied Flycatcher in East Lothian, etc.—Pied Flycatchers (*Muscicapa atricapilla*) seem to have been unusually plentiful on our east coast this year during the period of the spring migration. From Dunbar I heard of them from several sources. According to my information, they were first observed on 10th May, and for a few days were, comparatively speaking, quite common in the neighbourhood. Mr. D. Bruce wrote me on the 13th saying, that in the course of that and the two previous days he had seen no less than fifteen or sixteen pairs. On the 11th, two were seen by Mr. R. R. Sutter at East Barns; and in a stable there, a fine male, which Mr. Sutter kindly forwarded to me, was found dead on the 16th. About the same time, three were seen near St. Abb's; and when on the Isle of May recently I learned that they had also been common there. Almost every year a few Pied Flycatchers are observed on the east coast of Scotland, but, according to my notes, we must go back to May 1885 for a visitation at all approaching the present one. Continuous cold, easterly winds characterised both occasions.—WILLIAM EVANS, Edinburgh.

Golden Oriole in Clackmannanshire.—On the 19th of May, a Golden Oriole (*Oriolus galbula*) was picked up dead on the lawn of Montague Cottage, Menstrie, and brought to me for identification. On the previous day, I had a hasty glimpse of what appeared to be

a large yellow bird flitting about with a number of Thrushes. This may have been the bird found dead on the following day, or its mate. The bird has been presented to the Museum of the Smith Institute, Stirling.—JAMES COWPER, Minister of Menstrie.

Golden Oriole in the "Solway" Area.—The Golden Oriole (*Oriolus galbula*) is a very rare visitant to Scotland generally, and it is equally rare in our area of "Solway." Leaving one very doubtful record out of account, only one authentic instance of its occurrence here has hitherto been known to me. This was an individual shot in the spring of 1872 betwixt Kirkconnel and Sanquhar. It is now in Dr. Grierson's museum at Thornhill, but the last time I saw it there the specimen was in a very dilapidated condition. A Golden Oriole was shot near to Newton-Stewart at the end of April this year, and is now being preserved. This makes only the second bird of the species procured here, and it is rather singular that this should be so, because farther south the bird is a well-known spring migrant.—R. SERVICE, Maxwelltown.

White-fronted Geese in Fife.—During the last fifteen years or so, the only gray geese that I have met with in the north-east of Fife have been Pink-footed Geese and occasionally a few Graylags; while the sixty or so that I have secured from time to time have been Pinkfoots without exception. In April of this year, however, I secured one of three White-fronted Geese (*A. albifrons*) which were feeding on new-sown barley in a field within my district. A large number of geese were on the field, all the others apparently of the ordinary species; but the three White-fronted Geese kept by themselves, some little distance apart from the main body. After a long and tedious stalk, I was able to get to within twenty yards of them, and from that distance observed them closely for a few minutes. The three were identical in appearance and plumage (that of a bird of last year), the white frontal band being narrow, and the black patches on the breast only represented by a few scattered dark feathers; but the darker colour of the back, and the orange bill and white nail, were very noticeable. The birds were also distinctly less wary than Pink-footed Geese always are.

I have, on one occasion, killed a Pink-footed Goose (♂), with a white "nail," and the same bird not infrequently has white round the base of its bill; and it was only on closer inspection that I could determine this—to me—new species. The specimen is now in the Edinburgh Museum.—WILLIAM BERRY, Tayfield, Newport, Fife.

[We are informed of the bare fact that two other specimens of this species were obtained in the lower Tay district during the past winter.—EDS.]

Pochard in the "Clyde" Area. A Correction.—The small flock of Pochards (*Fuligula ferina*) were observed near Wishaw Station

on the 21st of February, *not* on the 21st of July as stated in the "Annals" for April (p. 109).—EDS.

King Eider in the Shetlands.—Referring to the editorial note on this subject (p. 112), I may state that I examined both the birds sent to London by Mr. Bankart on the day they arrived, and while they were yet unskinned. The male, as already announced, was a King Eider (*Somateria spectabilis*); the female was undoubtedly a Common Eider (*Somateria mollissima*). The measurements and weights were as follows:—*King Eider*, wing from carpus, 11 ins.; tarsus, 2 ins.; middle toe, $2\frac{1}{2}$ ins.; weight, 3 lbs. 14 oz. *Common Eider*, wing $10\frac{1}{2}$ ins.; tarsus, 2 ins.; middle toe, 3 ins.; weight, 3 lbs. 15 oz. The colours of the soft parts have been already described in my communication to "The Field" of 4th March last.—J. E. HARTING.

Little Auk in Barra in April.—On the 8th of April last, a cat brought in a Little Auk which it had evidently just captured and killed. The bird was in excellent condition, and had partially assumed its summer plumage. I sent it to the Edinburgh Museum of Science and Art.—WM. L. MACGILLIVRAY, Eoligary, Barra.

Carabus glabratus, Payk., in Clyde.—Mr. A. Adie Dalglish has shown me a specimen of *Carabus glabratus* taken by him at Glenmallon, Argyllshire, in 1897, at an elevation of about 600 feet. Mr. G. W. Ord has kindly given me another specimen of this species, collected at Craigmaddie, Dumbartonshire, at an elevation of 500 feet. *Carabus glabratus* has not, so far as I am aware, been recorded for "Clyde." Both specimens were sent to Mr. G. C. Champion, F.Z.S., for verification.—ANDERSON FERGUSON, Glasgow.

Huntemannia jadensis, S. A. Poppe—Extension of Distribution.—This Copepod was added to the British fauna in 1895, from specimens taken at the head of West Loch Tarbert, Cantyre. More recently it was obtained in the Cromarty Firth, and is recorded from there in the "Seventeenth Annual Report of the Fishery Board for Scotland," part iii. A further extension of the distribution of this species is indicated in the following remarks. I happened, during May last, to make a few hours' visit to two places on the Clyde, viz. Millport and Inverkip, and embraced the opportunity to examine some brackish-water pools at both the places named. *Huntemannia* was captured at each of these localities, and I am enabled now to give this interesting species a place amongst the Copepod fauna of the Clyde. The known distribution of *Huntemannia* in Britain seems to be restricted to the four places mentioned above; but the species will probably be found in other localities where the conditions are suitable. One of the Inverkip specimens—a female—carried two ovisacs like a *Cyclops*. This is the first time I have seen *Huntemannia* carrying eggs.—T. SCOTT, Aberdeen.

Leptopsyllus minor, T. and A. Scott, in the Clyde District.—This slender and minute Copepod was obtained in the same localities as the *Huntemannia*. The species was first taken between tide-marks at Musselburgh, Firth of Forth, and described and figured in the "Annals of Scottish Natural History" for January 1895. It has not been observed anywhere else since that time, except the two places on the Clyde now referred to. The genus is distinguished by the peculiar form of the fifth thoracic feet of the female. Three species have been recognised, viz. *Leptopsyllus robertsoni*, *L. intermedius*, and the one now added to the Clyde fauna—*L. minor*. *Leptopsyllus minor* measures scarcely the $\frac{1}{80}$ th of an inch in length, and is so slender as to appear, at first sight, like a minute fragment of fibre. The female carries several (at least 3 or 4) large eggs arranged in a line, end to end.—T. SCOTT, Aberdeen.

The Humming-bird Hawk-moth in the Edinburgh District.—The Humming-bird Hawk-moth (*Macroglossa stellatarum*) has been more abundant in this neighbourhood this summer than I have ever seen it before. The first I heard of was taken in Peeblesshire on 1st June, and on the 3rd my friend Mr. P. H. Grimshaw captured one at wild garlic (*Allium ursinum*) in Roslin Glen. On the 10th I observed quite a number—certainly not less than fifteen to twenty—on the Fife coast between Burntisland and Kinghorn. Two which I netted were hovering over flowering patches of *Lotus corniculatus* on a sunny bank, but most of them were flying about the cliffs and rocky places where they could not readily be reached. Several times three, and once four, were in view at the same moment. After 4 P.M. they gradually disappeared, the last being seen shortly after 6 o'clock. The only flowers besides the *Lotus* that I saw them visit were *Astragalus hypoglottis* and *Salvia verbenaca*. The next example I saw was on the Isle of May on the 15th. On the 16th I again met with the insect, this time between Longniddry and Aberlady. They were flying about the high roadside wall at intervals for a distance of two miles; and at one place I caught six without moving more than 100 yards. Altogether, I must have seen quite thirty on this occasion. The same day one was seen at Craiglockhart. In the forenoon of the 19th I noticed three, if not four, on Blackford Hill, and in the afternoon I found numbers careering about the rocks on Arthur's Seat. A similar outburst of this species occurred here thirty years ago (1868-1870).—WILLIAM EVANS, Edinburgh.

Humming-bird Hawk-moth in the Upper Clyde.—This season, since the beginning of June, the Humming-bird Hawk-moth (*Macroglossa stellatarum*) has been much in evidence. Individuals of this species were attracted in large numbers to a Rhododendron when in full bloom, in front of the Manse, where their characteristic movements were, for over a week, an interesting and attractive sight.—J. D. W. GIBSON, Carmichael Manse, Thankerton.

BOTANICAL NOTES AND NEWS.

Hierochloe borealis, *Roem. and Schult.*, in Kirkeudbrightshire.

—This grass has been found this season on the Solway coast, thus extending its known range of occurrence very greatly. We hope to include an article upon its distribution from Mr. Bennett in our next issue.

Wigtownshire Plants.—It may be worth while mentioning that *Raphanus maritimus*, Sm. ("E. B.," t. 1643), is represented by a type specimen in Sir James Smith's Herbarium, in the Linnean Society's possession. It was sent to Smith in 1800 by Mr. J. Mackay from the Mull of Galloway, and is referred to in "English Botany," under t. 1643 (1806), and the "English Flora," vol. iii. p. 227 (1825). The earliest record cited in the "Flora of Dumfriesshire" is that of Dr. Balfour in 1835. In the same collection there is a specimen of *Scirpus Tabernæmontani*, Gmel., labelled *S. glaucus*, from the side of a salt marsh on the west of Arbigland in Galloway, by Mr. J. Mackay, 1800. This is also referred to in "E. B.," t. 2321 (1811), and in the "English Flora," i. p. 57 (1824). The only record in the "Flora of Dumfriesshire" is Kirkeudbright, reported by J. M'Andrew, 1882; and Arbigland is given as a locality, but it does not appear to be quite clear whether this locality yields *S. lacustris* or *S. Tabernæmontani*. In any case, Mackay's record is the earliest for the county. *Vicia hirsuta*, Koch, var. *angustifolia* (*Ervum hirsutum*), var. *angustifolium*, Fries, "Novit Fl. Suec.," p. 231 (1828), occurs on the shingle at Stranraer with a reddish-purple-flowered form of *Vicia Cracca*, which, although probably an introduced plant, is worth further study. Among the *Euphrasiae* which I gathered in the county are *E. brevifolia*, *E. Rostkoviana*, and *E. gracilis*.—G. CLARIDGE DRUCE.

Cratægus Oxyacantha, *Linnaeus*.—It is much to be desired that Scottish botanists would examine the forms of this variable species. The prevailing form in Scotland is that known as *Cratægus monogyna*, Jacquin ("Fl. Austr.," iii. 50, t. 292); but this in itself is subject to considerable variation. In the midland counties *C. oxyacanthoides*, Thuill. ("Fl. Par.," ed. ii. p. 245), is also frequent. This latter plant is usually differentiated by having two or three styles, two- or three-stoned fruit, and glabrous calyx tube; the leaves are also more glossy, and Syme says that it flowers earlier than *monogyna*, which has one style (as the name suggests), one-stoned fruit, and downy calyx tube. I have collected a considerable number of specimens, many of which, however, do not answer to the characters assigned to either form; and, having recently had the opportunity of submitting them to Herr Freyn, of Prague, who for the past twenty years has been studying the forms of this

species, I thought his views would be interesting to British botanists. He writes: "The English *Cratægi* which you have sent me show how inconstant is the number of the styles in the White-thorn. We cannot, in my opinion, make use, with any result, either of the number of the styles or of the stones for distinguishing *C. Oxyacantha* and *C. monogyna*. The only tolerably certain character is given in the nervation of the leaves, as was pointed out by Boreau in 'Flore des Centre de la France,' vol. ii. p. 234 (1857), and specially clearly by Willkomm in 'Forstliche Flora,' pp. 611, 612. *C. Oxyacantha* (*oxyacanthoides*, Thuill.) has the lower leaf-nerves curved inwards. *C. monogyna* has them curved outwards. *C. monogyna*, besides, has generally, but not always, and especially in the south of Europe, strongly divided leaves." Some of my specimens from Oxfordshire, Berkshire, Surrey, Hampshire, and Northamptonshire, which had the incurved veins characteristic of true (Boreau's) *C. Oxyacantha*, had hairy calyx tubes. 'These Herr Freyn has named "*C. Oxyacantha*, L., var. *ericalyx*, Freyn, inedit., a typo calyce dense villosa, pedicellis plus minus villosulis differt.'" According to our British definitions, these plants, from their hairy calyx tube, would have probably been grouped under *C. monogyna*, but in some specimens collected by me the flowers on the same branch varied with one or two styles. I think the definition given by Herr Freyn will assist us in grouping the forms of the White-thorn in a more satisfactory manner than has hitherto been the case. In some examples from the Midlands, I find that the vegetative shoots on a branch bearing leaves with convergent nerves have also leaves with somewhat divergent nerves. This may be a hybrid plant, or it may show that the character based upon the nerves is not so precise as one is led to suppose. On this point further information is required; but, without knowing the character given above, I had marked this identical specimen "*C. Oxyacantha* approaching *monogyna*." A specimen collected by my friend Miss C. E. Palmer, and distributed, through the Bot. Exch. Club, from Warwickshire, Herr Freyn also names var. *ericalyx*. All my Scottish specimens belong to *C. monogyna*. There appears to be good ground for believing that this is a distinct species from *C. Oxyacantha*, and I should not be surprised if it may eventually be shown that the *C. Oxyacantha* in the Linnean Herbarium is also *monogyna*, as this appears to be the more frequent form in the north of Europe.—G. CLARIDGE DRUCE.

An Early Scottish Locality for *Sparganium affine*, Schizl. (S. natans, Linn.).—Mr. Clarke, in his interesting "First Records of British Flowering Plants," mentions as the earliest printed reference for the above species the third edition of Babington's "Manual" of 1851. The following letter to Sir James Smith will show that it had attracted attention in Scotland some time previously, and,

like many other Scottish plants, was recognised as distinct by George Don the elder. It may, however, be urged, with some reason, that the letter does not conclusively prove that *S. affine* was differentiated from *S. minimum*, Fries, but I think it extremely probable that Don knew both plants. The date of the communication is 1814, and is as follows: "I am satisfied that it is of frequent occurrence in the lakes of Scotland. It is probably referred to by Mr. Neill in his 'Tour to Orkney and Shetland' (1806), see p. 46.¹ When I exhibited the plant to George Don, who paid me a visit a short time since, he instantly recognised the foliage, but stated he had never seen it in flower. He had observed it in the Isle of Skye, on Ben Lawers, and at the head of Mar Forest. Should no better name occur, the trivial name *longifolium* will not be improper.—J. Fleming, F.R.S.E." Curiously enough, Smith does not refer to the plant mentioned in the above letter in either edition of the "English Flora." In "Topographical Botany" Mr. Watson gives, under *S. affine*, "Shetland, Dr. Fleming possibly." On the evidence afforded by this letter, *S. affine* is not recorded for Ben Lawers in the "Flora of Perthshire" although it is found in the county, and I have seen it from Skye and South Aberdeenshire.—G. CLARIDGE DRUCE.

Carex curta, Good, var. *dubia*, Bailey (sub. *canescens*).—The determination by Pfarrer Kükenthal of this as a British plant is of interest, as it is rare in America. As it is difficult sometimes for others to consult the descriptions of these new forms, I give Professor Bailey's notes, etc., on the var. :—

"*Carex canescens*, L., var. *dubia*, n. var.—Culm stiff, 1 foot high, longer than the long pointed leaves; spikes 3-6, all approximate, oblong, 10-20 flowered, light tawny; perigynium gradually narrowed into a beak half or more as long as the body, minutely rough on the angles alone, nerved, about the length of or a little longer than the scale. *C. helvola*, Blytt? '*Carex* Cat,' Bear River Cañon, Utah (No. 1231a, King's 'Survey'); perhaps also the No. 1018 of Wheeler's 'Survey,' from Tuin Lakes, Colorado.

"The variety differs from *C. canescens* in its stiffer culm, mostly shorter leaves, oblong and approximate spikes, and in the characters of the perigynium, much resembling the European *C. helvola* (itself a doubtful species), but differing in its narrower scales, and its nerved and rough-angled perigynium."—L. H. Bailey in "Botanical Gazette," No. 8, p. 119 (1884).

"¹ The following is Neill's account of the occurrence of the *Sparganium*: "In the Loch of Knitching, which occupies a hollow near the top of the high hill of Knitching in the vicinity of the Manse, I observed an aquatic plant, apparently a *Sparganium*; but although the plant is abundant, I could not find it in flower. Its leaves float on the surface of the water, in the manner of *Poa fluitans*. It differs from *Sparganium natans* in having narrower, coarser, and longer leaves. Any naturalist who may happen to visit Rousay at a different season of the year may find it worth while to examine the plant."

"*C. canescens*, var. *dubia*, Bailey.

"*C. elongata*, Olney, Bot. King's Report, p. 365, U.S., not Linn.; Bailey's 'Coulter's Manual,' p. 394, excluding description. Uintah Mts., Utah, Watson; and Alta, Wahsatch Mts., Jones."—Bailey in "Syn. North Amer. Carices"; "Proc. Am. Acad. Arts and Sciences," 1886, p. 143.

Kihlman, in "Meddel. Soc. Fauna et Flora Fenn.," xvi. 1888-91, pp. 69-75, discusses *Carex helvola*, Blytt, and considers it *C. canescens* × *lagopina*; while Blytt's *C. pseudohelvola* he referred to *C. canescens* × *norvegica*. The British specimens I have seen of *C. helvola* are poor compared with the beautiful specimens for Norway (Blytt) and Finland (Kihlman). From one locality in Finland *C. helvola* was named "*C. lagopina*" by the finder.—ARTHUR BENNETT.

Seed-production in *Dianthus deltoides*, L.—As a contribution to the records of the rate of reproduction in a plant that can scarcely be regarded as among the most prolific, I give the results ascertained on two plants in my garden in Old Aberdeen, where they grew on soil not naturally rich, and scarcely manured. The first plant was brought by me, in 1892, in its first year, from sandy links at St. Cyrus in S.E. Kincardineshire. Next year it produced 1811 flowers. A descendant of this plant, in 1898, bore 2675 flowers of full size and 109 small buds of flowers. Of seven capsules taken from it at random, I counted the seeds, which varied in number from 63 to 104 in the capsules, the average being 78. Of these, some were shrivelled; but not fewer than 50 per capsule appeared fully formed. Thus, even without the mere flower-buds, one plant, had it not been gathered, might have produced upwards of 130,000 seeds capable of germination.—JAMES W. H. TRAIL.

CURRENT LITERATURE.

The Titles and Purport of Papers and Notes relating to Scottish Natural History which have appeared during the Quarter—April-June 1899.

[The Editors desire assistance to enable them to make this Section as complete as possible. Contributions on the lines indicated will be most acceptable and will bear the initials of the Contributor. The Editors will have access to the sources of information undermentioned.]

ZOOLOGY.

ORNITHOLOGICAL NOTES FROM ABERDEEN. W. Wilson. *Zoologist* (4), vol. iii. pp. 271-272 (June 1899).

ABNORMAL OCCURRENCE OF THE PIED WAGTAIL (*MOTACILLA LUGUBRIS*) THROUGH THE WINTER IN ABERDEENSHIRE. W. Wilson. *Zoologist* (4), vol. iii. p. 268 (June 1899).

A FORTNIGHT IN THE HIGHLANDS. By G. T. Porritt, F.L.S., F.E.S. *Entomologist*, vol. xxxii. pp. 86-91 (April 1899).—An interesting account of a fortnight's insect-collecting in the neighbourhood of Rannoch in the month of June 1898.

EUPLEXIA LUCIPARA IN FEBRUARY. R. S. Gordon, F.E.S. *Ent. Record*, vol. xi. p. 111 (April 1899).—A specimen captured on 16th February at Corsemalzie, Whauphill, Wigtownshire.

NOTES ON THE ADDITIONS TO THE BRITISH LIST OF COLEOPTERA SINCE CANON FOWLER'S "COLEOPTERA OF THE BRITISH ISLES" (*continued*). *Ent. Record*, vol. xi. pp. 159-161 (June 1899).—In this instalment mention is made of the capture of *Bembidium virens*, Gyll., on the shores of Loch Maree, Ross-shire.

PSEUDO-NEUROPTERA, PLANIPENNIA, AND TRICHOPTERA, COLLECTED AT RANNOCH IN JUNE 1898. By James J. F. X. King, F.E.S. *Ent. Mo. Mag.* (2), vol. x. pp. 80-83 (April 1899).—Twenty-seven species of Pseudo-Neuroptera, eleven of Planipennia, and twenty of Trichoptera are recorded.

NOTES ON CERTAIN PALÆARCTIC SPECIES OF THE GENUS HEMEROBIUS. NO. 1. INTRODUCTORY REMARKS AND THE GROUP OF *H. NERVOSUS*. By Robert M'Lachlan, F.R.S. *Ent. Mo. Mag.* (2), vol. x. pp. 77-80 (April 1899).—A new species (*H. mortoni*) is described, the types of which were taken by Mr. Morton at Rannoch in June 1898.

NOTES ON CERTAIN PALÆARCTIC SPECIES OF THE GENUS HEMEROBIUS. NO. 2. *H. MARGINATUS*, *H. LUTESCENS*, *H. HUMULI*, AND *H. OROTYPUS*. By Robert M'Lachlan, F.R.S. *Ent. Mo. Mag.* (2), vol. x. pp. 127-133 (June 1899).—*H. orotypus* recorded from Aberdeenshire, Strathglass, Fortingal, Inch, Killin, the Clyde District, and Rothiemurchus.

BRITISH DIPTERA UNRECORDED OR UNDESCRIBED BY ENGLISH AUTHORS. By R. H. Meade, F.R.C.S. *Ent. Mo. Mag.* (2), vol. x. pp. 100-103 (April and May 1899).—*Tephrochlamys magnicornis*, Lw., recorded from Pitlochry; *Thelida oculata*, Fln., from Inveran; and *Phytomyza zetterstedtii*, Schiner, from Dalkeith.

BRITISH ISOPODA CHELIFERA. By the Rev. Canon A. M. Norman, M.A., D.C.L., LL.D., F.R.S. *Ann. and Mag. Nat. Hist.* (7), vol. iii. pp. 317-341 (April 1899).—The synonymy and geographical distribution of twenty-three species are given in this paper, with Scottish localities for most of them.

BOTANY.

REPORTS ON EXCURSIONS (of Glasgow Natural History Society, from 11th September 1897 till 27th August 1898, in *Trans. Nat. Hist. Soc. Glasg.*, 1897-98, v. pp. 274-286) contain the following:—

List of Fungi observed, 11th September, in Lennox Castle grounds, by Mr. Wm. Stewart; plants observed, 11th April, in Glen Spean; 23rd April, at Bothwell Castle; 7th May, at Cadzow Castle and Chatelherault; 28th May, at Kelburne Castle, Fairlie; 6th August, at Auchincruive; 13th August, at Stonebyres; and 27th August, at Rossdhu.

PROCEEDINGS OF THE NATURAL HISTORY SOCIETY OF GLASGOW, Session 1897-98, v. pp. 287-303.—Numerous botanical notes: Fungi observed near Kilmarnock during Meeting of Scottish Cryptogamic Society in 1897; Flowering Plants from Renfrewshire, Ayrshire, and Stirlingshire; Hepatics from Moidart.

METEOROLOGICAL NOTES, AND REMARKS UPON THE WEATHER DURING THE YEAR 1897, WITH ITS GENERAL EFFECTS UPON VEGETATION. By James Whitton. *Trans. Nat. Hist. Soc. Glasg.*, 1897-98, v. pp. 163-178.—Based on observations made about Glasgow, chiefly in the city parks.

SCOTTISH RUBI. By C. H. Waddell. *Journ. Bot.*, 1899, p. 225.—Enumerates several brambles collected near Coatbridge, and determined by Rev. W. M. Rogers. They include *R. fissus*, Lindl., *R. hirtifolius*, Muell. and Writz., var. *danicus*, Focke, and *R. corylifolius*, Sm., var. *sublustris*, Lees, all from Lanarkshire (v.c. 77), and *R. Rogersii*, Linton, from the King's Park, Stirling (v.c. 86).

NOTE ON RASPBERRY ROOTS (spirals and curved conditions). By G. F. Scott Elliott, M.A., etc., and Mrs. Fingland. *Trans. Nat. Hist. Soc. Glasg.*, 1897-98, v. pp. 205-207.

LIMITS TO THE RANGE OF PLANT-SPECIES. By G. F. Scott Elliott. *Trans. Nat. Hist. Soc. Glasg.*, 1897-98, v. pp. 208-216.

THE MOSSES OF CAMPSIE GLEN. By James Murray and R. D. Wilkie. *Trans. Nat. Hist. Soc. Glasg.*, 1897-98, v. pp. 217-219.—Enumerates 115 species and two varieties.

NEW AND RARE SCOTTISH HEPATICÆ. By W. H. Pearson. *Journ. Bot.*, 1899, pp. 274-275.—Among species sent by Mr. S. M. Macvicar from West Inverness, enumerates three (*Lejeunea calcarea*, Lib., *Kantia arguta* (Mart.), and *Scapania aspera*, Mull. and Bern.) as new to Scotland, and twelve others as new to West Inverness.

MICROFUNGI OBSERVED NEAR KILMARNOCK, AYRSHIRE. By D. A. Boyd. *Trans. Nat. Hist. Soc. Glasg.*, 1897-98, v. pp. 159-160.

ADDITIONAL NOTES ON THE PERONOSPORAÆ AND USTILAGINEÆ OF NORTH AYRSHIRE. By D. A. Boyd. *Trans. Nat. Hist. Soc. Glasg.*, v. pp. 161-162.—Contains new records for Ayrshire of two fungi and several food-plants.

NOTES ON MYCETOZOA. By Arthur Lister, F.R.S. *Journ. Bot.*, 1899, pp. 145-152, pl. 398.—The following are named as sent from

West Aberdeenshire by Mr. Cran:—*Physarum citrinum*, Schum., from Den of Craig; *Lamproderma physaroides*, Rost., var. β *sessile*, from Rhynie; *Cribraria violacea*, Rex, from Rhynie; *Dianema corticatum*, Lister, from Rhynie.

REPORT OF A VISIT TO SANDA AND GLUNIMORE. By John Paterson and John Renwick. *Trans. Nat. Hist. Soc. Glasg.*, 1897-98, v. pp. 197-204.—On pp. 203-204 is a list of plants gathered on these unfrequented islands (near the south end of Cantyre).

REVIEWS.

A NATURAL HISTORY OF THE BRITISH LEPIDOPTERA. By J. W. Tutt, F.E.S. (London: Swan Sonnenschein and Co., 1899.)

This is a closely printed octavo book of 560 pages, in which the author shows himself to be, at least, a master in the arts of compilation and condensation. It is divided into two parts, the first of which, devoted to introductory matter, occupies 112 pages, and contains nine chapters. These deal with the origin of the Lepidoptera, the ovum, embryology, parthenogenesis or agamogenesis, external and internal structure of the larva, variation in the imagines, protective coloration and defensive structures of lepidopterous larvæ, and, lastly, the classification of Lepidoptera. Upon all these subjects, we find a great mass of information, collected from every conceivable source, and presented in such a concise manner as to save the student a vast amount of time and trouble in searching for any particular fact. Chapter IX., dealing with classification, contains much debatable matter, and whether the author's ideas will be accepted generally only time can show. The system adopted in the book appears to us somewhat revolutionary, and the characters presented by the imago kept too much in the background.

The second part of the volume, containing (exclusive of index) 434 pages, deals with 80 species belonging to the "super-families" Micropterygides, Nepticulides, Cochlidides, and Anthrocerides, so that, on the average, nearly $5\frac{1}{2}$ pages are devoted to each. On this basis, we estimate that the complete work will occupy twenty-four or twenty-five volumes the size of the first. Truly the preparation of these will be a herculean task! Each species is treated of under the following plan: first, a full list of synonyms and bibliographical references, then an exact copy of the original description, this last a good idea, and an extremely useful feature of the book. Following this comes a description of the imago, then particulars as to variation, egg-laying, description of egg, habits of larva, descriptions of larva, pupa and cocoon, method of dehiscence, food-plants, parasites, etc. Extremely full details are given as to

localities, time of appearance, and distribution outside the British Isles, and the trouble expended in the preparation of this portion of the work must have been enormous. It strikes us, indeed, that there cannot surely be much omitted from this important work for the future investigator to turn his attention to, so fully does the author enter into the subject. We cordially congratulate Mr. Tutt upon the successful issue of this first volume, and trust that he will be encouraged to proceed rapidly with the succeeding parts. If to the mere collector it may appear at first sight the *driest* work on British Lepidoptera that has yet appeared, it must on the other hand prove to the serious worker an invaluable companion.

A LIST OF EUROPEAN BIRDS, INCLUDING ALL THOSE FOUND IN THE WESTERN PALÆARCTIC AREA, WITH A SUPPLEMENT. By Heatley Noble, F.Z.S. (London: R. H. Porter, 1898.)

This is an old and valued friend in a new guise, namely Dresser's List altered in form, and brought down to date. To this Mr. Noble has added a supplement containing the species which are *said* to have occurred in the region covered, but which, for various reasons, are considered inadmissible. Mr. Noble has bestowed considerable care on the revision, and in its new small-octavo form and neat cloth binding it is both a handy book of reference and useful in a variety of ways.

THE NATURALIST'S DIRECTORY, 1899. (London: L. Upcott Gill.) Price One Shilling.

We note a great advance, in the shape of general improvement, in the current issue of this useful little book. Its weakest point now is to be found in the Foreign Section. We quite fail to realise why this important part of the work should be confined to those persons who desire to exchange specimens, which means the exclusion from its pages of the majority of the leading foreign naturalists! Why should there be a section devoted to Microscopy? Surely the students classed under such a heading must be either Zoologists, Botanists, or Geologists. We trust to see further improvements in next year's volume.

The Annals

of

Scottish Natural History

No. 32]

1899

[OCTOBER

IN MEMORIAM—GEORGE WALKER ORD.

GEORGE WALKER ORD, whose untimely end Scottish naturalists must deplore, was the son of a farm-servant, and was born in the parish of King Edward in Aberdeenshire. His early life was spent in Macduff. His school-days over, he went to Glasgow, entering the service of the Corporation as a boy in Kelvingrove Museum. In this service he remained till the end. He died from an attack of peritonitis after three days' illness, at his residence, 6 Craignestock Place, Glasgow, on the 9th of August, aged 28 years, and was interred in Sighthill Cemetery.

Ord received an elementary education at Murray's School and the Public School, Macduff, and early distinguished himself. From the Science and Art Department he obtained an *honours* certificate with a high place in the order of merit in Principles of Agriculture, when he was *fourteen* years of age. He supplemented his schooling when he came to Glasgow, and between 1892 and the year of his death he attended classes in the Glasgow and West of Scotland Technical College, the Athenæum, and the University of Glasgow. At the Athenæum examinations in French and Spanish, in two years, he gained £8 in money prizes. He took the first prize in Chemistry (Second

Inorganic Course) at the Technical College, and fifth place at the Zoology class in the University. He also held first class advanced stage certificates from the Science and Art Department in Botany, Geology, and Chemistry.

As a servant of the Corporation of Glasgow, he began his duties in November, 1886. He was chiefly employed in the ordinary routine work of Kelvingrove Museum, where he was associated, as an assistant, with Mr. J. M'Naught Campbell, F.Z.S., who tells me that his heart was chiefly in the Zoological work which fell to him. He was appointed Curator of the People's Palace, in Glasgow Green, which was formally opened by Lord Rosebery in January, 1898. This institution is simply a Museum, Art Gallery, and Winter Garden. Mr. James Paton, F.L.S., his chief in this Department, formed the highest opinion of Ord's character and abilities. According to Mr. Paton, his energy was such as to cause some solicitude as to his work. He had a remarkable faculty for rapidly acquiring an intelligent and comprehensive view of a new department of work, which made him invaluable as an assistant. He was entirely responsible for the arrangement of the "Glen" collection, acquired from the Trustees of the late D. Corse Glen, F.G.S., which consisted of 12,350 objects, chiefly geological. His loss, Mr. Paton declares, is one not only to the Corporation, but to the community also.

As a naturalist, he was widely and favourably known in Glasgow. He was the last Secretary of the Clydesdale Naturalists' Society. He joined the Andersonian Naturalists' Society in 1890, and, throughout the period of his connection with it, was one of its most active members. He acted as Convener of the Entomological Section of this Society continuously from 1893 till his death. He joined the Natural History Society of Glasgow in 1896, and was elected a Member of Council in the following year.

He began his natural history studies in the Glasgow district as a botanist and lepidopterist, and the relations of plants and insects were from first to last matters of great interest and careful investigation to him. Geology claimed his attention in the field for a time, but for several years he had been occupied chiefly with the Tipulidæ, and

had only recently begun to investigate the Aphidæ of "Clyde."

To this journal he contributed an article on "Entomologising in Ayrshire" (1892, pp. 238-240); botanical notes to "The Scottish Journal of Natural History" (1890); a paper on "Chemistry in Museums," read to the Museums Association, Glasgow meeting, 1896, and published in the Report of Proceedings of that body (1896), pp. 113-124; a series of eight articles in the "Glasgow Weekly Echo" (9th June to 4th August 1894), on the collections in Kelvingrove Museum; to the "Transactions of the Natural History Society of Glasgow," vol. v. (N.S.), pp. 85-88, a paper on 'The Constancy of the Bee'; and to the same volume of these "Transactions," pp. 190-196, 'Notes on the Tipulidæ of the Glasgow District.' To this Society he also read a paper, in March 1899, on "Lepidoptera in relation to Flowers." To the Andersonian Naturalists' Society, his annual report as Convener of the Entomological Section was a valuable local contribution; but his chief work submitted to this Society was his "List of the Lepidoptera of the Glasgow District" (1896), which brought to a point his investigations and those of his colleagues in the Entomological Section of the Society. This last is unpublished, and will be superseded by the projected list to be published in 1901. At his death, he was engaged (in connection with the "Fauna of the Clyde Area," to be published on the occasion of the meeting of the British Association in Glasgow in 1901) on a list of the Macro-Lepidoptera of "Clyde" in collaboration with Mr. A. Adie Dalgleish, and on lists of the Tipulidæ and Aphidæ with Mr. Robert Henderson. It is a matter for congratulation that, owing to his association with the gentlemen named, his work in these lists will not be lost. He threw himself into this work with characteristic energy. In the last letter (10th July) the writer received from him, he tells of his success in a short holiday in the neighbourhood of the city, in which he had added about "fifteen species to our list of Tipulidæ, bringing the total number of satisfactorily determined species up to more than 80—half the British List." The last time I saw him, in the end of July, I placed in his hands Saunders's "Hemiptera-

Heteroptera of the British Isles," which he had been anxious to secure. He was eagerly helping those who were preparing lists of other groups.

Of Ord, the man, it is not possible for one who knew him well to write without enthusiasm. He had been sickly in his youth, but he grew stronger with his years after coming to Glasgow, and developed into a robust-looking man. His face was striking, expressing when at rest great concentration, with a dash of scorn in the region of the mouth. He had a good voice, spoke readily and well, was a trenchant debater, and when he became animated his Aberdonian accent was pronounced, adding a touch of piquancy to his speech in our Western ears. His information covered a wide field; he was well read in literature and history, and for a time mixed in local politics, his sympathies being advanced. His natural ability was above the common order. In the field he was the most cheerful of companions. Under such circumstances "joyousness" seemed to be the dominant note of his life. His nature was singularly noble and self-sacrificing. Prone to debate, he was, by those who had not the privilege of his acquaintance, misjudged on this account, as he also was from his sometimes oracular manner; but no one, however well he knew him, could ever discover in his lofty nature any of the dross of passion. His love for nature rested on an æsthetic, as well as a scientific basis. He was opposed to "collecting" on general grounds, set a good example to others in this respect, and favoured all reasonable measures for protection. A thorough democrat, he was no respecter of persons; but he had in large measure that "reverence for life," the absence of which in naturalists Mr. Ruskin has deplored. His end came with a suddenness almost tragic, and those great hopes which we had built on the foundation of his character and capacity are irretrievably wrecked. He was *our* "marvellous boy," and all who knew him well will cherish the memory of a bright and disinterested spirit.—
JOHN PATERSON.

ON THE OCCURRENCE OF RISSO'S GRAMPUS
(*GRAMPUS GRISEUS*, CUV.) ON THE EAST
COAST OF SCOTLAND.

By R. H. TRAQUAIR, M.D., LL.D., F.R.S.

ON the 22nd August last Mr. C. Muirhead presented to the Museum of Science and Art, Edinburgh, the skull of a small whale which had been taken up by the trawl some miles to the east of the Isle of May. On examining it and comparing it with other Cetacean crania in the Museum collection, I found that it belonged to the rare British species *Grampus griseus*, commonly known as Risso's Grampus or Dolphin.

So far as Scotland is concerned, the record of its occurrence is small. Six examples were captured at Hillswick, Shetland, in 1889, of which the crania of four and the entire skeletons of two individuals were secured by Sir William Turner for the Anatomical Museum of the University.¹ Again, in 1893, two specimens were recorded by Mr. Service from the Solway Firth,² and the skeleton of one of these was procured by that gentleman for the Museum of Science and Art, in which it is now exhibited.³ I have heard of no other instances of its having been found on or off the Scottish coasts, and this seems also to be the first record of its occurrence along the eastern shores of Great Britain.

The entire length of the skull is eighteen inches, its greatest breadth being twelve and three-quarters; the lower jaw and ear bones are, of course, wanting. The cervical vertebræ, anchylosed as usual into one piece, were immovably fixed to the occiput, and on forcibly separating them an abnormal condition of the condylar region was disclosed, which must have quite prevented the animal, when alive, from moving its head on the vertebral column. More than that, the cervical vertebræ, when readjusted, are seen to have got a twist to the right side, so that the left

¹ "Proc. Roy. Phys. Soc. Edin.," 1891 (1892), vol. xi. pp. 192-197.

² "Ann. Scot. Nat. Hist.," 1893, p. 1.

³ R. H. Traquair, *ib.* 1894, p. 1.

pedicle of the arch of the last cervical vertebra is opposite the centre of the foramen magnum, the spinal canal consequently passing into the skull in an oblique direction.

INCREASE AND DECREASE OF CERTAIN SPECIES OF BIRDS IN THE TAY AREA.¹

By Col. JOHN CAMPBELL, M.B.O.U.

THE distribution of birds, and the influences which affect their increase or decrease in different parts of the country, have always had a special interest for ornithologists.

Although climatic conditions, and consequent scarcity or abundance of food, play an important part in those changes, more especially when we inquire into the decrease of certain species, it is difficult to account for the appearance of birds in districts where they had been previously unknown, and for their settling down in those districts and making them their permanent home.

The question is whence they came, and what induced them to come? Numerous theories have been propounded to account for this phenomenon, which I myself shall not attempt to elucidate further than by suggesting that overpopulation may have driven these birds from the districts where they were bred, and caused them to seek new ground where food was more abundant and the conditions of climate and surroundings as favourable as the districts from which they came. Any how, it is a case of *J'y suis, j'y reste*—at least, let us hope so. Apart from the question of natural conditions, however, comes that of protection as a means of increasing our bird population, and persecution as a means of diminishing it.

With regard to the *increase* of birds, in the following paper I propose to give five typical examples of certain birds breeding in the Perthshire district—birds which twenty years ago had either not been recorded, or, if recorded, only as occasionally breeding or as winter visitors.

¹ We would be glad to see such subjects taken up and amplified for every *Natural Area* in Scotland.—EDITORS.

The birds I shall enumerate are the Tufted Duck, the Pochard, the Shoveller, the Wigeon, and the Stock Dove.

THE TUFTED DUCK (*Fuligula cristata*).—Mr. Harvie-Brown has already furnished the readers of the "Annals" with most interesting information on the expansion of the breeding area of this species, and given an exhaustive account of its gradually spreading from Europe, which appears to have been its original home, through Finland and North Norway, to Scotland. What I wish to show in this paper is the marvellous rapidity with which it has become acclimatised and spread throughout the comparatively small district of Perthshire. Writing in the "Transactions of the Perthshire Society of Natural Science" (vol. i. p. 97, 1888-89), Colonel Drummond-Hay, than whom there was never a more observant naturalist, reports the presentation of a nest and eggs of a Tufted Duck to the Museum, and speaks of it as "the first authentic instance that I have got of the nest having been got in Perthshire." This nest came from Methven, and was presented by Colonel D. M. Smythe. Mr. Marshall, Stanley, in the same year, reports it as "a rare duck with us."

The above, however, was not the first record of its breeding in Perthshire. In the month of May 1884 I was fishing on Dupplin Loch, when I saw some birds which I at once recognised as Tufted Ducks. At that time, though this species was a well-known winter visitor to the Tay and Earn, I had never heard of its breeding in the county; but on asking Irvine, the head keeper, he told me that for the last few years one or two pairs had nested there. On my mentioning the circumstance to Colonel Irby, he scouted the idea; but when I sent him a nest and eggs—which I got through the kindness of the late Lord Kinnoull—he was convinced. Since then it has multiplied to a wonderful extent, and may now be found on almost all the lochs which are contained in the basins of the Tay and Earn.

THE POCHARD (*Nyroca ferina*) has followed suit. In the "Transactions of the Perthshire Society of Natural Science" (vol. i. p. 97, 1888-89), Colonel Drummond-Hay reports the nest of the Pochard as having been found at

Methven, and presented to the Museum by Colonel D. M. Smythe. He describes it as "another nest which was only very lately known to be found in Perthshire." The same year I found it breeding on Dupplin Loch, and though it is not yet quite so common as the Tufted Duck, its numbers are, I am glad to say, increasing, and it may now be considered one of our regular breeding ducks.

THE WIGEON (*Mareca penelope*).—Writing in 1878-79, Colonel Drummond-Hay mentions the Wigeon as being "pretty frequent every winter and autumn," and in his synopsis of the Perthshire Birds he includes it among the "Birds of Passage (Winter)." The first record of its nesting in Perthshire is in the Perthshire Society of Natural Science report for 1888-89 (vol. i. p. 97). Colonel Drummond-Hay states: "The nest of another rare Perthshire-breeding duck, that of the Wigeon (with eggs), was presented by Sir Robert Menzies. . . . Its nesting places, previous to that, had, in Scotland, only been noticed in the Western Islands, Orkney, parts of Aberdeenshire, and the extreme Northern Counties." I visited the Black Mount in May 1895, and on one small loch I counted eight males, the ducks being at that time on their nests, which I did not attempt to disturb.¹ M'Intyre, the head keeper, told me it was equally abundant on other lochs in that district, where it regularly breeds now.²

¹ Wigeons were quite common on Loch Eagh and along the reedier margins of the River Gower in the autumn of 1874, and were known to breed there even prior to that season, as well as on other lochs in the district. This may be taken as the earliest *recorded* date, so far as I know; but notice of earlier dates for this and other localities of the same district would be acceptable.—J. A. HARVIE-BROWN.

² Localities of nesting distribution of the Wigeon in Scotland did not include, as far as our records teach us, the Outer Hebrides or Aberdeenshire prior to the date of 1888-89. Rather should the earlier general distribution of the species, as a breeding bird, be described as follows—*i.e.* prior to 1888. In Orkney, only amongst the southern islands for some years prior to 1888. On the mainland, in the Northern and North-Eastern districts—*i.e.* Caithness and Northern and Central Sutherlandshire, always east of the watershed. Later they came southward, through North and North-East Ross-shire, rarely, if ever, being found breeding west of the great dividing chain of mountains, and thence through North Inverness-shire, and reaching North-West Perthshire some time previous to 1874, where they bred commonly—if not abundantly—on the Moor of Rannoch and along the Gower River and Loch Eagh. There were no records, to our knowledge, of nesting birds in Aberdeenshire prior to that of Geo. Sim; nor are we aware of any records of sufficient authenticity anywhere in the

THE SHOVELLER¹ (*Spatula clypeata*).—In 1879-80 Colonel Drummond-Hay states: "There are a few instances of the Shoveller being shot in the spring at long intervals." ("Scottish Naturalist," vol. v. p. 339). Mr. Marshall, Stanley (p. 261 of the same vol.), reports that a specimen was shot at Ballathie, and says it is "a very rare duck with us." The first nest and eggs recorded were presented to the Museum of the Perthshire Society of Natural Science by Sir John Millais in 1890. They came from Murthly, where this species is comparatively common now. I was not aware till this year that its range had extended to the Black Mount, from which place I had specimens sent me; and as it has evidently got a foothold, it will doubtless spread, as the other species have done, over the whole district, that is to say, if allowed to.

The last species which I shall mention, the STOCK DOVE (*Columba oenas*), made its first recorded appearance, I believe, at Blairhoyle, near Callander, in 1878;² then at Cardean, near Dunkeld, in 1879; in the neighbourhood of Alyth, 1885; Blackpark, Moneydie, 1889. In 1892 a nest and eggs were presented to the Museum of the Perthshire Society of Natural Science by Lord Stormont.³ They came from Lynedoch. It also breeds at Craighall-Ratray, near Blairgowrie.

In 'Notes on the Birds of the Tay and its Tributaries,' by Colonel Drummond-Hay ("Scottish Naturalist," vol. v.

Outer Hebrides, nor of any on the west side of the main watershed of Scotland, though they approach the latter closely on the east side. We do not here speak of the extension *since these earlier dates*.—J. A. HARVIE-BROWN.

¹ I have considerable material relating to the increase of this species in Scotland, but as yet not arranged, nor easily available. I fancy it would, at this time, be rather difficult to say decidedly that its principal nesting area lies between Forth and Tay, or farther north, or in the Moray basin—so rapid has the increase been of late years. It is desirable to record the earliest appearances at as many localities as possible now, although it can scarcely be classed among our *rarer* Scottish birds.—J. A. HARVIE-BROWN.

² This locality is within the watershed of "Forth."—J. A. HARVIE-BROWN.

³ Further data as regards the spread of this species will be found in an article 'On the Stock Dove' in the "Roy. Phys. Soc. Trans.," read 21st February 1883; and later accounts as regards their appearance and increase in the east and north-east counties may be gathered from the account of the species in the Faunal Series by Buckley and Harvie-Brown, and in the "Annals of Scottish Natural History"; and Mr. Evans of Edinburgh, and other naturalists, can give details and earlier records for the south-east and south of Scotland.—J. A. HARVIE-BROWN.

p. 295, 1880), writing of the Stock Dove, he says : " Though exceedingly rare, may perhaps be justly included among the birds of the district, it having been found breeding in the vicinity of Dunkeld." Although it has been claimed as a Perthshire bird for the last twenty years, its distribution seems to be somewhat erratic. Having heard that it had been found breeding in the Crieff district, and knowing also that it nested at Lynedoch, I thought its range might extend through the woods of Methven, Balgowan, and Abercairney to Crieff; but though I have made numerous inquiries, such is not the case. What appears to me to be extraordinary, is that this species should have, during the last twenty years, established itself in the above-named somewhat circumscribed localities, but that—though, like all the pigeons, a prolific breeder—the breeding area beyond these places has apparently not extended—at least to any appreciable extent. We know, however, that since it was first recorded, several small colonies have been established where they were unknown before.

Since writing the above notes, I have heard from Sir James Clerk-Rattray, of Craighall-Rattray, who gives me some most interesting information on the subject, and " has known the Stock Dove there as long as he can remember." " This year there is a nest (at least I conclude so, from seeing the old birds flying out and in) in the precipice under the drawing-room balcony; and my keeper, who has been here about ten years, says he is confident they are increasing in numbers, as he knows of several nests this year in the banks above the river." It is most extraordinary that this small colony should have existed so long without extending their borders, which, apparently, do not go beyond the cliffs and banks of the Ericht, at Craighall-Rattray. (See article on Stock Dove, Roy. Phys. Soc. Edin., read 21st February 1883, by J. A. Harvie-Brown.)

Having given the above instances of the appearance and increase of certain birds, I propose to devote the second part of this paper to the *decrease* of certain species, and what I believe to be the causes which lead to it.

Whilst I am glad to say that several birds, thanks to protection, show signs of increasing, there are three species

which we should specially endeavour to protect. These are the Goldfinch, the Dotterel, and the Great Spotted Woodpecker. None of these birds do any damage, and consequently there can be no object in destroying them or their eggs, except the selfish one of acquisition.

THE GOLDFINCH (*Carduelis elegans*) is almost extinct. I have myself only once seen it in Scotland, but there can be no doubt, if the few pairs which are annually known to breed were not trapped or killed and their nests taken, this beautiful bird would again become established.

THE DOTTEREL (*Eudromias morinellus*) is one of our rarest birds now, and I only know of two places in the Perthshire district where it breeds. It is, I suppose, almost extinct on the Cumberland hills, and unless the taking of its eggs is put a stop to, it will, before many years, become extinct also in Perthshire.¹

THE GREAT SPOTTED WOODPECKER (*Picus major*).—Though I have only once seen it myself, I have been credibly informed that this bird breeds regularly on an estate in Perthshire, where it is carefully preserved, so I suppose the notices which we occasionally see in the newspapers of its occurrence in neighbouring counties may possibly refer to individuals which have been bred in, and strayed from this district.²

It is useless, I suppose, to attempt to say a good word for any of the RAPTORES.

Thanks to Lord Breadalbane, the Golden Eagle (*Aquila chrysaetos*) is still to be found in the Black Mount, but the Hen Harrier (*Circus cyaneus*), the Common Buzzard (*Buteo vulgaris*), the Kite (*Milvus ictinus*), the Honey Buzzard (*Pernis apivorus*), and the Osprey (*Pandion haliaetus*), though still included in the lists of Perthshire birds, are—with the exception of one species—practically extinct, although one hears at rare intervals of an occasional specimen being

¹ But consult "A Vertebrate Fauna of Lakeland, including Cumberland, etc.," by Rev. H. A. Macpherson, 1892, p. 348; and on our latest authority we find that "its numbers have undoubtedly decreased of late years" (Howard Saunders's "Manual," 1899, p. 535); but we have still to learn of its actual extinction having taken place.—J. A. HARVIE-BROWN.

² Further evidence of their having bred at this locality, which dates previous to the year 1897, has been placed in our hands, but not for publication.—J. A. HARVIE-BROWN.

trapped or shot. The popular idea is that all hawks are mischievous, and that, therefore, they should be extirpated. The Peregrine and the Sparrow Hawk certainly do mischief; but most, if not all, of those enumerated above are comparatively harmless, so far as game is concerned. The Osprey is exclusively a fish eater, and the others feed principally on insects, voles, small birds, mice, and other vermin. A story is told of a venerable Highland laird who, when spoken to about the protection of "hawks," said "the name 'hen harrier,' was quite enough for him"! Truly, if one gives a dog a bad name, you may as well hang him!
Verb. sap.

The causes which lead to the decrease and final extinction of certain species of birds are, in my opinion, climatic conditions, with the scarcity or abundance of food resulting therefrom, and persecution. The exceptionally cold winter of 1894-95 is an example of the effects of climate on bird life. As is well known, those birds which could not escape from its severity were decimated, and thousands of Song Thrushes, Blackbirds, Redwings, and Starlings, besides innumerable small birds, were found frozen during that long-continued storm. For a time it looked as if several species would be completely wiped out. Since then, a succession of comparatively mild winters and favourable summers has had a wonderfully recuperative effect, and this year the numbers of our song birds, generally, are as great as they were previous to the winter above referred to.

With regard to the other cause of decrease—persecution—there is only one remedy, and that is strict and effective protection. When it has become the misfortune for a bird—it matters not what species—to arrive at a certain degree of rarity, it also attains considerable notoriety, and one would imagine there was the greater necessity for protecting it. Instead of this being the case, however, it is hunted down and shot as soon as it makes its appearance. If it has the temerity to breed with us, and manages to do so before being discovered and killed, there is a grand competition for the honour of taking the nest and eggs, the old birds are shot for the purpose of identification (!), and, with the exception of the obituary flourish in the "Scotsman," there is the end of it!

The Order for the Protection of Wild Birds in Scotland issued last year by Lord Balfour of Burleigh as Secretary for Scotland will, I hope, do good; but having got the power, it is the duty of all who are interested in birds to do their utmost to see that the orders for the preservation of our birds are carried out.

Last year the Perthshire Society of Natural Science issued a letter to most of the proprietors and others in the county, asking them to use their best endeavours to carry out the Order, and to see that the birds named in it were protected. I trust this letter may have a good effect.

I believe, indeed I know, there are instances where scheduled birds have been shot through pure ignorance. I have been told of a Great Spotted Woodpecker having been mistaken for a Jay (which, by the way, in the county in which it was killed, is also a scheduled bird!). I am confident this was a mistake; but farmers, gamekeepers, gardeners, and others may thus kill an unknown bird and unconsciously be the means of preventing a rare species from remaining and breeding in the country. I have no doubt, however, that had they recognised it, and known that it was amongst those scheduled, they would have spared it—at least, let us hope so.

Whilst harm may thus be unwittingly done, the most serious damage is caused by amateur collectors and professional egg-stealers. These folk are animated with the mania of acquisition—they boast of the number of “clutches” of eggs of such or such a species they possess, or they simply, as the poacher does, earn their living by taking what does not belong to them. They have no scruples as to corrupting a gamekeeper or gillie and inducing him to shoot a scheduled bird or collect a nest of forbidden eggs. This underhand trafficking in rare birds and their eggs is what will, in the long run, exterminate some of our most interesting species if a stop is not put to it.

We saw last spring that an Osprey had been shot, and the delinquent fined £1. It would be interesting to know how much he made out of the transaction.¹ All who are

¹ The specimen, we understand, was returned by the police to the proprietor of the estate where it was shot, and a purely fictitious value has most unfortunately been placed upon it by evidence given before the House of Commons.—
J. A. HARVIE-BROWN.

interested, and more especially proprietors, should do their utmost to put a stop to these nefarious practices, which, since the issuing of the Orders, constitute a breach of the law, and consequently can and ought to be adequately punished.

There is another, and I think a most important way of putting a stop to this illegal destruction, and that is by preventing bird-stuffers from preserving scheduled birds or selling their eggs. As an instance:—The Kingfisher is now one of the birds scheduled throughout Scotland. Any Kingfisher killed in Scotland must have been illegally killed. Why should a bird-stuffer be allowed to condone the offence by preserving the bird? Nothing would sooner put a stop to the killing of scheduled birds than by forbidding them to be stuffed. But I suppose this would require another Act of Parliament, and by the time such an Act could be passed, some at least of the birds which would be benefited by it would probably also have “passed.”¹

OBSERVATIONS ON THE BIRDS OF THE ISLANDS OF TIREE AND COLL.

By Lieut.-Col. L. H. IRBY, F.L.S., F.Z.S., etc.

THE “Annals of Scottish Natural History,” July 1898, pp. 153-163, contains a list of birds observed in Tiree by Peter Anderson, gamekeeper on that island.

This list I would supplement by giving a notice of the birds observed on the adjacent island of Coll, where I passed some time during two springs, and in early and late autumn. In Tiree, as a joint shooting tenant, I had good opportunities for observation, and noticed the arrival of Sand Grouse in June 1888.

To Anderson’s Tiree list may be added Common Linnet (*Linota cannabina*), seen by both Capt. Savile Reid and

¹ Another plan would be to prevent the sale or purchase of such birds in the flesh as are scheduled, or the skins or eggs of such as bear a British locality; but, of course, great difficulties would promptly arise at the mere suggestion of such a drastic act, as also would many others in carrying it out if passed.—J. A. HARVIE-BROWN.

myself among the only furze bushes on the island. Of course the avifauna of the two islands is so nearly identical that it is only necessary to mention the slight differences, and needless to repeat a full list. Probably, as regards Coll, except with the Passerine birds, the differences are the result of want of continuous observation.

The islands are only two and a half miles apart, with the islet of Gunna intervening, Coll being favoured with much broken and undulating ground; in many situations bracken, furze, heather, etc., grow luxuriantly, especially the ling in the peaty districts.

The flora is, therefore, richer. A most conspicuous plant is *Geranium sanguineum*, which grows in splendid masses near Breachacha. An introduced plant, *Spirea salicifolia*, is found also near Breachacha. In bare, wind-swept Tiree there is little or no covert: all plants are so stunted by the wind that even the ling is rarely more than two inches long, and seldom flowers. As regards bird-life, the island is further handicapped by the greatly congested population: the too numerous crofters and cotters mostly keep semi-wild dogs and a cat or two, while their half-starved cattle eat all the scanty vegetation quite bare, even the flags of the yellow iris.

The people are also systematic egg-hunters: scarcely an egg of any size can escape them, unless on an inaccessible island or rock; and "the men of the wild Tiree" also harry eggs on the coasts of Coll and other islands, much to the detriment of the Eider Ducks, whose nests are usually close to the sea.

In addition to the differences given below, are one or two others easily accounted for, e.g. the Bernicle Goose (*Bernicla leucopsis*) is so abundant at times in Coll as to cause serious damage to the rich pastures; whilst in Tiree, from comparative absence of food, this goose is seldom seen. On the other hand, the White-fronted Goose (*Anser albifrons*) is much more numerous in Tiree than in Coll, because of the greater quantity of shoreweed (*Littorella lacustris*), water-cress, and other aquatic plants, on which they chiefly feed. The Cuckoo is not often seen in Tiree, but in Coll this bird is apparently more numerous than in any country I have

visited. The obvious cause of this is the extreme abundance of hairy caterpillars, particularly those of some of the Bombycidæ, which in Tiree are scarce or absent, owing to want of food-plants. I may add that I have noticed young Cuckoos in Coll during the last week in August.

There is apparently a regular passage across both islands of the White Wagtail (*Motacilla alba*) both in spring and autumn; and I think further observation will prove the same, but not in any numbers, with the Black-tailed Godwit (*Limosa belgica*), as this bird passes by the east coast of Ireland and Solway Firth in spring, probably *en route* to Iceland.

I.—BIRDS BREEDING BOTH IN COLL AND TIREE.

1. WHEATEAR, *Saxicola ænanthe*.
2. STARLING, *Sturnus vulgaris*.
3. RAVEN, *Corvus corax*.
4. HOODED CROW, *C. cornix*.
5. TWITE, *Linota flavirostris*.
6. TREE SPARROW, *Passer montanus*.
7. HOUSE SPARROW, *P. domesticus*.
8. CORN BUNTING, *Emberiza miliaria*.
9. MEADOW PIPIT, *Anthus pratensis*.
10. ROCK PIPIT, *A. obscurus*.
11. SKYLARK, *Alauda arvensis*.
12. PEREGRINE FALCON, *F. peregrinus*.
13. MERLIN, *Falco æsalon*.
14. KESTREL, *F. tinnunculus*.
15. SHELDRAKE, *Tadorna cornuta*.
16. WILD DUCK, *Anas boschas*.
17. TEAL, *Querquedula crecca*.
18. RED-BREASTED MERGANSER, *Mergus serrator*.
19. ROCK DOVE, *Columba livia*.
20. CORN CRAKE, *Crex pratensis*.
21. WATER HEN, *Gallinula chloropus*.
22. COOT, *Fulica atra*.
23. RINGED PLOVER, *Ægialitis hiaticula*.
24. PEEWIT, *Vanellus vulgaris*.
25. OYSTER-CATCHER, *Hæmatopus ostralegus*.
26. SNIPE, *Gallinula cœlestis*.
27. DUNLIN, *Tringa alpina*.—Hundreds in Tiree; very few in Coll.
28. COMMON SANDPIPER, *Totanus hypoleucus*.—More in Coll.
29. ARCTIC TERN, *Sterna macrura*.
30. COMMON TERN, *S. fluviatilis*.

31. BROWN-HEADED GULL, *Larus ridibundus*.—Occasionally.
32. COMMON GULL, *L. canus*.
33. HERRING GULL, *L. argentatus*.
34. LESSER BLACK-BACKED GULL, *L. fuscus*.
35. RICHARDSON'S SKUA, *Stercorarius crepidatus*.
36. BLACK GUILLEMOT, *Uria grylle*.

II.—BIRDS BREEDING IN COLL NOT YET NOTICED AS NESTING
IN TIREE.

1. SONG THRUSH, *Turdus musicus*.—Many.
2. BLACKBIRD, *T. merula*.
3. WHITETHROAT, *Sylvia cinerea*.—One pair in 1891; not seen following spring.
4. WHINCHAT, *Pratincola rubetra*.—Many.
5. STONECHAT, *P. rubicola*.—Many.
6. WREN, *Troglodytes parvulus*.—Doubtless also in Tiree.
7. COMMON LINNET, *Linota cannabina*.—Many.
8. REED BUNTING, *Emberiza schoeniclus*.—Commonly.
9. HOUSE MARTIN, *Chelidon urbica*.—Some nests at Arinagour, 1898.
10. COMMON HERON, *Ardea cinerea*.—Used to nest on low bushes on island in loch near Arinagour.
11. WIGEON, *Mareca penelope*.—One nest noticed 1892.
12. RED GROUSE, *Lagopus scoticus*.
13. PARTRIDGE, *Perdix cinerea*.
14. GOLDEN PLOVER, *Charadrius plumbealis*.—A few pair.
15. REDSHANK, *Totanus calidris*.—Has nested near Arinagour.
16. CURLEW, *Numenius arquata*.—Occasionally.
17. BLACK-THROATED DIVER, *Colymbus arcticus*.
18. RED-THROATED DIVER, *C. septentrionalis*.

III.—BIRDS RECORDED AS BREEDING IN TIREE, BUT NOT IN COLL.

1. GREENSHANK, *Totanus canescens*.
 2. SHOVELLER, *Spatula clypeata*.
 3. POCHARD, *Fuligula ferina*.
 4. TUFTED DUCK, *F. cristata*.
 5. SCOTER, *Ædemia nigra*.
 6. LITTLE TERN, *Sterna minuta*.
 7. KITTIWAKE, *Rissa tridactyla*.
 8. RAZORBILL, *Alca torda*.
 9. COMMON GUILLEMOT, *Uria troile*.
- } At Kenvara.

IV.—BIRDS RECORDED FROM TIREE, NOT FROM COLL.

1. GOLD-CRESTED WREN, *Regulus cristatus*.
2. SWIFT, *Cypselus apus*.

3. MUTE SWAN, *Cygnus olor*.—Probably an escape.
4. QUAIL, *Coturnix communis*.
5. GRAY PHALAROPE, *Phalaropus fulicarius*.
6. LITTLE STINT, *Tringa minuta*.
7. CURLEW SANDPIPER, *Tringa subarquata*.
8. RUFF, *T. pugnax*.
9. BLACK-TAILED GODWIT, *Limosa belgica*.
10. SANDWICH TERN, *Sterna cantiaea*.
11. LITTLE TERN, *S. minuta*.
12. GREAT SHEARWATER, *Puffinus gravis*.
13. FORK-TAILED PETREL, *Procellaria leucorrhœa*.

V.—BIRDS OBSERVED IN COLL, BUT NOT IN TIRRE.

1. WHITETHROAT, *Sylvia cinerea*.
2. REED BUNTING, *Emberiza schœniclus*.
3. BULLFINCH, *Pyrrhula europœa*.—Once seen.
4. HOUSE MARTIN, *Chelidon urbica*.
5. NIGHT-JAR, *Caprimulgus europœus*.—A straggler.
6. SNOWY OWL, *Nyctea scandiaca*.—Winter of 1891-92.
7. HEN HARRIER, *Circus cyaneus*.—A straggler.
8. COMMON BUZZARD, *Buteo vulgaris*.—A straggler.
9. RED GROUSE, *Lagopus scoticus*.

An "Eagle" was seen in Coll in 1897.

Dr. Smith, when waiting for ducks, 14th October 1898, observed "the largest Owl he ever saw." Peter Gray, shepherd, about that date "saw an Owl as big as an Eagle." "Said Owl dropped a Land Rail it was carrying." Could this have been an Eagle Owl? or more probably a Snowy Owl?

NOTES ON THE LESSER WHITETHROAT
(*SYLVIA CURRUCA*, LINN.) AS A CLYDE
SPECIES.

By JOHN PATERSON.

THE question of the Lesser Whitethroat as a Scottish species in the past and at present, is a curious and puzzling one. These notes relate to the records which refer to the "Clyde" area.

One of the earliest references to this species in Clyde is that of the Rev. William Patrick, in the "New Statistical

Account" of the Parish of Hamilton, in 1838. He says: "This bird, supposed to be confined to England, is common here. The nest is sometimes in a hedge, but more frequently among long dry grass, by the side of a wood, four or five inches from the ground, and generally overshadowed by a tiny bramble or some other shrub. The nest is more compact than that of the larger Whitethroat, which, in addition to its numerous names, is here called 'Beardy' and 'Blethering Tam.' The song of the *Sylviella* is sweeter and more perfect than that of the common sort, and its eggs are also very different." Patrick was a good naturalist, best known nowadays through his "Popular Description of the Indigenous Plants of Lanarkshire" (1831), and much of the natural history in the accounts of Lanarkshire and, in a less degree, of Renfrewshire parishes in the "New Statistical Account" is from his pen.

About the same time a statement of its occurrence appears in the "New Statistical Account" of Paisley Parish (p. 163), which contains a long account of the natural history, supplied, as a footnote informs us, by Dr. A. R. Young, "formerly of this town [Paisley], but now resident at Dunoon." Dr. Young's statement is: "The following summer birds are occasionally seen: *Curruca sylvia*, *sylviella*, *locustella*, *hortensis*, *sibilatrix*, *atricapilla*, and *Regulus trochilus*." There is another old statement by James Rennie, author of "Bird Architecture," "Bird Miscellanies," etc., but I have been unable at date to get at the original. [It appeared in Rennie's edition of "Montagu's Orn. Dict.," p. 17¹ (1831), EDS.] So far, I only know from Macgillivray that Rennie mentions it as occurring in Ayrshire.

Mr. A. G. More's 'Distribution of Birds in Great Britain during the Nesting Season,' which appeared in the "Ibis," 1865, gives no new light on "Clyde," except the following:—"Mr. R. Gray believes it breeds near Loch Lomond, and he has also obtained the bird from Argyleshire." In the year before this statement appeared, Mr. Gray had contributed an article on the 'Quadrupeds, Birds, and Fishes of Loch Lomond,' etc., to a "Tourist's Guide Book to the Trossachs, Loch Lomond," etc., and he says there that this

¹ "I am confident I have seen it in Ayrshire," *loc. cit.*

species is "not common, but less obtrusive than the preceding, frequenting places not so much exposed." We may dispose of the Loch Lomond records appearing in Mr. James Lumsden's sketch paper of the birds of that region in the "Proc. Nat. Hist. Soc. Glas." (iii. p. 63), and in his "Guide to the Natural History of Loch Lomond," by quoting a letter which I received from him recently. He says (29th May 1899): "I included it in my list of Loch Lomond birds as the late Mr. Gray, author of "The Birds of the West of Scotland," told me he had seen it here. I cannot be *certain* of having seen it myself." With regard to Gray's statement, above quoted, to More, that he had obtained the bird from Argyleshire, it may be said that the catalogue of Gray's birds, which are now in the Museum of Science and Art, Edinburgh, contains no reference to the Lesser Whitethroat; but Mr. William Evans has a skin and eggs of this species which he got from Mrs. Gray, and these he believes Gray got in the west. Unfortunately, there are no data with either, so that we cannot identify the skin (which I have seen) with that obtained by Gray in Argyleshire. It is, however, Mr. Evans says, done up exactly as the skins prepared by Gray usually were. In Gray and Anderson's 'Birds of Ayrshire and Wigtownshire' ("Proc. Nat. Hist. Soc. Glas., i. p. 283) it is stated to be "sparingly met with," and to have been "well known as an Ayrshire bird thirty years ago." I am unable to say where Gray gets this information as to Ayrshire "thirty years ago," unless it be from Rennie. "The Birds of the West of Scotland," etc. (1871), does not help us much, as there are no particulars of occurrences, but only a generalisation that "it is sparingly met with in some parts of Ayrshire, Renfrewshire, and Dumbarton, and extends to the middle of Argyleshire." In Bryce's "Geology of Arran," etc. (1872), Mr. Gray states in his article on Birds that he had not succeeded in getting this species there, but does not doubt that it is there for the finding. According to the same writer, in his article 'On the Birds of Glasgow and its Vicinity' in the "Notes on the Fauna and Flora of the West of Scotland" (1876), it is "a regular summer visitant," but it is not included in Mr. H. C. Young's 'List of Birds which Breed in the Vicinity of

Glasgow' in the same publication, although he acknowledges "very valuable assistance" from Messrs. Gray and Dixon for "making corrections and additions to the list." The article on the 'Birds of the Clyde Valley' in Pollock's "Dictionary of the Clyde" is purely a compilation, so that no notice need be taken of it here. The Rev. J. D. W. Gibson believes he has observed it at Glenapp, South Ayrshire, and what he took to be a pair of this species frequented the hedgerows of the glebe of his manse at Carmichael, Lanarkshire, during the early summer of 1896 ("Ann. Scot. Nat. Hist.," 1897, p. 204). I have seen eggs, stated to have been taken by Mr. James Hood from a nest near South Dean Farm, Kilmarnock, twenty years ago. The eggs had remained unidentified until about two years since, when they were submitted to Messrs. J. Craig and M. Barr of Beith, by whom they were sent on to me. There can be little doubt, I think, about these being Lesser Whitethroat's eggs. Unfortunately, however, their story is a very old one.

As Mr. Robert H. Read knows the Lesser Whitethroat very well, and as he spent three years in the Glasgow district, I thought it would be interesting to know if he had met it here, as he spent much time birds'-nesting in this district. He writes in reply to my inquiries (30th May 1899): "During my three years' residence near Glasgow, I have never met with the Lesser Whitethroat in the flesh. There is a mounted specimen in the Paisley Museum, which the Curator [the late Morris Young] told me was the only one he had met with. He obtained it near Paisley, I believe (I have locality, and, I believe, date, in my note-book), and he was rather proud of the specimen." "It is true," writes Mr. J. M. B. Taylor, the present Curator of the Paisley Free Museum, "that there is a mounted specimen of the Lesser Whitethroat [in the Museum], and that it was presented by the late Mr. Young. As usual with Mr. Young, he neither gives date nor locality. I know, however, that it was killed in the decade 70."

The list of Renfrewshire birds in the possession of the Paisley Naturalists' Society states that the Lesser White-throat is "not common, has bred near Port-Glasgow."

Mr. J. M. B. Taylor tells me that he took a Lesser Whitethroat to Mr. Kirk, taxidermist, Glasgow, but it was too far gone to set up as a specimen. "This one was shot among willows on the east side of Glasgow. It was shot by Mr. James Waterston, Edinburgh."

Two years ago, in May (1897), Messrs. Barr and Craig, of Beith, visited Ailsa Craig. At that time, according to Mr. Tulloch, one of the lightkeepers, there were several Lesser Whitethroats on the Craig. Two of them were seen at a few yards distance, and the gentlemen named thought they were Lesser Whitethroats. About the same time Mr. W. Eagle Clarke visited Ailsa Craig, and he told me shortly thereafter that birds pointed out to him by the lightkeeper as Lesser Whitethroats were Common Whitethroats.

Mr. Charles Kirk, taxidermist, Glasgow, tells me that he is *quite sure* that he once met with the Lesser White-throat in the "Clyde" area. This was in July 1898, in a small glen behind Shandon on the Gareloch. The bird seen was carrying food, and he had it under observation for a considerable time, as he spent half an hour in a fruitless search for its nest.

It is a remarkable fact that though in the case of some of the warblers, regarding the distribution of which the details are very meagre in Gray's "Birds of the West of Scotland," etc. (for instance, the Garden and Grasshopper Warblers, and the Chiffchaff and Wood Wren), our knowledge has been greatly extended in the last ten years, to our knowledge of the Lesser Whitethroat there has been in the same period no substantial addition. In all the above detailed information there is very little indeed that is thoroughly satisfactory and unimpeachable. Nothing would give me greater pleasure than to see this interesting warbler occupying a more uncertain place in the avifauna of "Clyde." At present, most of the evidence I have been able to bring together is very inconclusive, and some of it is open to suspicion. The status of the Lesser Whitethroat, indeed, remains with us more a matter of opinion than of actual knowledge.

SCAUP-DUCK NESTING IN SCOTLAND.

By J. A. HARVIE-BROWN.

I HAVE received apparently a very authentic account of the Scaup breeding in the north of Scotland, which I reproduce as follows. Mr. H. Noble, writing to me under date of 22nd June 1899, says: "It may interest you to know that I found an undoubted nest of Scaup (*Fuligula marila*) in Sutherlandshire this month. I was staying on Speyside and received a wire from my friend, Captain S——, as follows: 'Do Scaup breed in Scotland?' I answered that there was no authentic case. He then wrote me that he had been watching a pair on a loch for ten days, and thought they must be nesting. I thought there must be some mistake, and went to see for myself. Great was my joy on seeing a grand old male Scaup and a female. They were not very wild, and, after a short stalk, I got within 20 yards of them, and sat watching them with a glass for some time. The male was certainly the finest bird I ever saw, and the female had a beautiful white face. We hunted the edge of the loch most carefully, but saw no sign of any nest except a Merganser's. I then waded across to a small island, and found a duck's nest with three eggs well covered up and in rushes about 5 feet from the water's edge. I saw at once that the eggs were not Merganser's, Mallard's, or Widgeon's, and that they were very like Scaup's eggs I had received from Iceland. We left the loch for a week, and on our return I visited the nest again. I got within 10 feet of the duck, and lay in the rushes watching her for some time close to the nest. I was now nearly certain we were on the right track, but still I had not *actually seen* her leave the nest, so we retired for another day. She had now commenced to sit, and I had the pleasure of seeing her *swim off the nest*, quite close to me. She swam fully 20 yards very low in the water before she took wing. There was now no possibility of a doubt that we had found the right nest. There were nine eggs. The nest was deep, cup-shaped, and better made than most ducks' nests that I have

found (and I have seen nests of all the ducks that breed in these islands, with the exception of the doubtful Golden-eye)."

It may be within the memory of those who have read an early record of my own of Scaups seen frequenting a certain loch in Sutherland—dating as far back as 1868—that on that occasion the male was shot, and from the habits of the bird, as observed at the time, there seemed to be scarcely any doubt that the female was not far distant; and I wrote: "I shall not be surprised to hear of the young and eggs of the Scaup being found in either one or other of four different localities." In the same article¹ I referred to a previous tentative record by Mr. Selby, who tells us: "A single female was shot by Sir William Jardine on a small loch between Lochs Hope and Eriboll. She was attended by a young one, which unfortunately escaped among the reeds"; and Sir William Jardine kindly informed me that "the old bird certainly had a young one with it, but whether a young Scaup or not it would be difficult to say."

I think there is no reason whatever to doubt Mr. H. Noble's record, and we may accept it as completely trustworthy and accurate. The letters and correspondence of Jardine-Selby and Selby-Jardine are now carefully preserved, and perhaps the possessor of the former may be able to throw some additional light upon Jardine and Selby's tour in Sutherlandshire, which, at this stage, would prove of interest to Scottish and British naturalists.

SOME NOTES ON THE FRESH-WATER ENTOMOSTRACA OF ABERDEENSHIRE.

By THOMAS SCOTT, F.L.S.,

Naturalist to the Fishery Board for Scotland.

THE fresh-water lochs of Aberdeenshire, though comparatively few in number, appear to contain as rich an entomostreacan fauna as those of any other county in Scotland. In a gather-

¹ 'On the Birds found breeding in Sutherlandshire,' "Proc. Nat. Hist. Soc. Glasgow," 1875, p. 69.

ing from one loch recently visited (Loch of Park), as many as forty-four species were obtained, while thirty-nine, thirty, and twenty-seven species respectively have been obtained in gatherings from other lochs.

I propose, in the following notes, to mention a few of the rarer or more interesting species that have been observed; and those that belong to the Cladocera will be referred to first, and afterwards those belonging to the Ostracoda and the Copepoda.

THE CLADOCERA.

The Cladocera obtained in gatherings recently collected, though perhaps not more numerous individually than the Ostracoda or the Copepoda, are represented by a greater number of species. All the families of the Cladocera, except the *Holopedidae* and *Leptodoridae*, are represented, and both *Holopedium* and *Leptodora* may yet be found in some of the hill lochs, but as these are pelagic forms, a boat and tow-net may be required to capture them; the gatherings referred to in these notes are all shore gatherings.

The SIDADÆ are represented in recent gatherings by *Sida crystallina* (O. F. Müller) and *Daphnella brachyura* (Lievin), (or *Diaphanosoma brachyurum* as it is now called); the first is common in the Loch of Skene, and the other is equally common in Loch of Park. *Latona setifera*, another member of the same family, and much rarer than either of the two species just referred to, was also obtained in Loch of Park, as well as in a gathering from Corby Loch, but only one or two specimens of *Latona* were obtained in each of these gatherings.

The DAPHNIDÆ observed in recent gatherings include several interesting species, but I can only at present record three of them, viz. *Ceriodaphnia laticaudata*, P. E. Müller, *Ceriodaphnia megalops*, G. O. Sars, and *Scapholeberis mucronata* (O. F. Müller). The first, which has a comparatively broad and angulated post-abdomen, was obtained in Corby Loch. The second, which is the largest of the British species of *Ceriodaphnia*, and which occurred in a gathering from Loch of Park, has not previously been observed in Scotland; in this species the shell is distinctly but somewhat irregularly striate, after the manner of a *Simocephalus*—only females have been observed so far. The third (*Scapholeberis*) has been obtained in Loch of Skene, Loch of Park, and Corby Loch, and also in one of the ponds in Duthie Park. Amongst the specimens collected, some have the head rounded and without a tooth, others possess a vertex tooth which varies in length in different individuals, and the length of the posterior spines also varies more or less.

The BOSMINIDÆ. This family contains only one genus—*Bosmina*; specimens of the common *B. longirostris* (O. F. Müller) have been collected in ponds in the Duthie Park and in Loch Callater.

The LYNCODAPHNIDÆ are represented in the gatherings recently collected by, at least, three species, viz. *Drepanothrix dentata* (Euren), *Acantholeberis curvirostris* (O. F. Müller), and *Ilyocryptus sordidus* (Lievin). *Drepanothrix* was obtained in Bishop Loch and in Loch of Park: it is readily distinguished from its near allies by the hook-like process on the dorsal margin of the shell. The distribution of this species appears to be co-extensive with the British Islands. *Acantholeberis* was obtained for the first time in Aberdeenshire in a gathering of Entomostraca from Loch Callater, which Mrs. T. Wemyss Fulton kindly presented to me. Loch Callater, which is situated a few miles to the south of Braemar and near the road leading over the hills to Glen Dole and Glen Clova, has an elevation of considerably over a thousand feet above sea-level, and this adds very much to the interest of the gathering. The *Acantholeberis* was one of the most common of the species observed in the Loch Callater gathering, and many of the specimens were of large size and carried pseudova; the species has, more recently, been observed also in Bishop Loch near Parkhill. *Ilyocryptus*,—the third Lyncodaphnid referred to,—though not previously recorded from Aberdeenshire, probably occurs in most of the lochs of Scotland; its shell is usually more or less coated with mud, which prevents it from being readily noticed; it has been observed in Loch of Skene, in Corby Loch, and Bishop Loch.

The LYNCEIDÆ obtained in the Aberdeenshire lochs recently examined comprise several comparatively rare forms, and a few of these will now be referred to. *Alona tenuicaudis*, G. O. Sars, which is considered to be a rare species in Scotland, was obtained in a gathering from Loch of Park; in this species the post-abdomen is narrow and moderately elongate, the upper and lower margins are nearly parallel, and the marginal setæ are comparatively small except at the posterior angle at the base of the claw, where there are a few moderately long setæ. *Alona rustica*, T. Scott, was obtained in Bishop Loch. *Alona intermedia*, G. O. Sars, was also observed in this loch as well as in Corby Loch (this species is described in some of my previous papers as *Alona neglecta*, T. Scott).¹ The very small, but pretty, *Alonella nana* (Baird) and *Alonella exigua* (Lilljeborg)² were both obtained in Corby Loch and Bishop Loch, while the second was observed also in Loch of Skene. *Pleuroxus uncinatus*, Baird, *Pleuroxus lewis*, G. O. Sars, and *Pleuroxus trigonellus* (Müller) were obtained in a gathering from Loch of

¹ See remarks on this species in the "Seventeenth Annual Report of the Fishery Board for Scotland," part iii. p. 200 (1899).

² See also remarks on this species, *op. cit.* p. 201.

Park; *P. uncinatus* was also observed in Corby Loch. *Chydorus barbatus* (Brady) occurred in Loch of Skene, Bishop Loch, and Loch of Park.

The POLYPHEMIDÆ are represented by only one species—*Polyphemus pediculus* (Lin.), which occurred in all the lochs examined except Corby Loch. *Bythotrephix longimanus*, Leydig, another of the Polyphemidæ so common in some of the Lochs of Scotland, has not been observed in any of the Aberdeenshire lochs hitherto examined.

THE OSTRACODA.

Only eight species of Ostracoda have been observed in the gatherings of fresh-water Entomostraca recently collected, all of which are moderately common. *Cypris exculpta*, Fischer, occurred in Loch of Skene, Loch of Park, and Corby Loch; *Herpetocypris reptans* (Baird) and *Cypridopsis villosa* (Jurine) were frequent in Loch of Park, while *Limnocythere inopinata* (Baird) was obtained in Corby Loch. In September 1890 I examined ten species of Ostracoda there; but, with the exception of *Cypridopsis aculeata* (Lillj.) and *Ilyocypris biplicata* (Koch), they are all similar to those recently observed. Only one species of *Candona* (*Candona candida*) has been observed in the lochs of Aberdeenshire hitherto examined.

THE COPEPODA.

The Copepoda obtained in the Aberdeenshire lochs recently examined comprise even a greater number of rare forms than those that have been found amongst the Cladocera, but these rare forms belong partly to the *Cyclopidae* and partly to the *Harpacticidæ*; the only *Diaptomus* observed hitherto is the common *Diaptomus gracilis*, G. O. Sars, which was moderately abundant in Loch of Skene, and was also obtained in Corby Loch and Bishop Loch. Amongst the *Cyclopidae*, *Cyclops dybowskii*, Lande, was moderately frequent in a gathering from Loch of Park; this species requires careful examination to distinguish it from *Cyclops oithonoides*, G. O. Sars. Loch Lomond is the only other loch in Scotland where I have obtained this species; it occurred there in a shore gathering collected to the south of Balmaha. *Cyclops languidus*, G. O. Sars, another rare species, was obtained in a gathering from Corby Loch; this *Cyclops*, which has the antennules sixteen-jointed, has only hitherto been observed in Scotland in Loch Doon in Ayrshire. *Cyclops fuscus* (Jurine) was obtained in a gathering from Loch of Park, so also were *Cyclops macrurus*, G. O. Sars, and *Cyclops affinis*, G. O. Sars;

¹ See "Ninth Annual Report of the Fishery Board for Scotland," part iii. p. 282 (1891).

these three species of *Cyclops*, and especially the last two, are rare in the lochs of Scotland, and have not previously been recorded from Aberdeenshire. *Cyclops varicans*, G. O. Sars, which also appears to be a rare species in Scotland, has been observed in two of the gatherings collected recently, viz. in one from Loch of Skene and in another from Loch of Park. *Cyclops phaleratus* (Koch) was obtained in Loch of Skene and in Loch of Park; this species was also obtained many years ago, in a canal at Peterhead, by the late Dr. Robertson of Millport.

The following species belonging to the *Harpacticidæ* may now be mentioned. *Canthocamptus minutus*, Claus, occurred in gatherings from Loch of Skene, Corby Loch, and Bishop Loch. It is readily distinguished by the peculiar form of the caudal furca, and by the bifid spines that fringe the anal operculum; the species, though added to the British fauna only within recent years,¹ seems to be widely distributed. *Canthocamptus inornatus*, T. Scott, was obtained in a gathering from Bishop Loch, in which it did not appear to be very rare; the species was described a few years ago from specimens gathered in Rescobie Loch, Forfarshire. *Moraria anderson-smithi*, T. and A. Scott, was also obtained in Bishop Loch; this species, though not previously recorded from Aberdeenshire, is widely distributed in Scotland and England. *Marænobiotus vej dovskii*, Mrazek, which occurred in the gathering from Loch of Park, a locality that has also yielded not a few rare species of *Cyclops*, is, like most of the other Harpacticids, a shore dweller. It was first observed in Scotland in a gathering collected on the north shore of Loch Vennachar,² and afterwards in a shore gathering from Loch Doon, Ayrshire. This is now the third Scottish Loch in which the species has been observed. Mrazek obtained the species in Bohemia, and Mr. Bruce (of the Jackson-Harmsworth Expedition) collected it in fresh-water ponds in Franz Josef Land;³ this seems to indicate that the species may have even a wider distribution than that now known to us.

The total number of entomostracan species obtained in the Aberdeenshire lochs recently examined reaches to over sixty; and, from the favourable appearance of the lochs already visited, there can be little doubt that this number will be largely increased. What at present appears somewhat noteworthy is the small number of the Ostracoda that have yet been observed. No species of *Cypris* (I use

¹ "Ann. Scot. Nat. Hist.," July 1895, p. 173, and Oct. 1895, p. 236, Pl. IV. Figs. 14-20.

² "Ann. and Mag. Nat. Hist." (6), vol. xviii, p. 3, Pl. I. Figs. 13-21, Pl. II. Fig. 23 (1896).

³ "Journ. Lin. Soc." (Zoology), vol. xxvii, p. 99, Pl. VI. Figs. 12-17 (1899).

this name in its recent restricted application) has been noticed, while *Herpetocypris* and *Candona* are represented by only one species each. As is well known, the distribution of the Ostracoda is even more erratic than that of the Copepoda or Cladocera; and therefore, though apparently scarce at one time, at another they may be more or less common. This uncertainty in the distribution of these organisms, though at times somewhat disappointing, has one advantage: it tends to keep alive the interest in their study, as there is always the possibility that the results of the next gathering may be better than the last one.

FLORULA OF A PIECE OF WASTE GROUND AT ABERDEEN.

By JAMES W. H. TRAIL, A.M., M.D., F.R.S.

REPORT FOR 1898.

IN continuation of former reports¹ on the species detected and the changes observed in the vegetation on a portion of the filled-up bed of the river Dee, inclosed near the chief railway station in Aberdeen, I submit a statement on the observations made during the summer of 1898. The chief census was made on 15th July; but it was supplemented by notes made during visits both earlier and subsequently.

There are now five sidings laid out on the ground, connected at the west end with the lines for ordinary traffic. At the east end the sidings spread out to allow room for the approach of carts for loading the trucks; and the surrounding ground has been a good deal encroached upon with heaps of pipes, tiles, and other materials ready for transport.

The area covered with cinders has been somewhat increased during the past year. There is still a considerable part of the original surface free from this encumbrance, chiefly along the northern side near the station. To the

¹ "Annals of Scottish Natural History," v., 1896, pp. 231-245; vi., 1897, pp. 24-31, 237-245.

south of the cinder area, near the mills, the original surface is encroached on, as stated above, at its east end. On this follows a patch of the original surface, the vegetation on which usually shows a coating of dust from the meal and flour of the mills. Only a very narrow border remains uncovered by cinders along a good part of this edge in its western half; but this border widens near the extreme western end, and becomes a strip of several yards in width. On this strip occur several of the more local plants noted below. Conspicuous amongst these are *Volulus sepium*, *Scutellaria galericulata*, and *Mentha viridis*, the former extending long shoots over the other vegetation, and the latter each forming a vigorous and healthy patch bearing flowers.

As in 1897, the coarse vegetation was so dense that in many places it seemed likely to extirpate all less sturdy growth; the seedlings of thistles, hemlock, and other coarse plants covering the opener spots not yet tenanted by the parent plants or by large grasses. Indeed, during June, it appeared as if there could be no passage amidst the thickets of plants, some of which exceeded five feet in height. At that time there appeared but little trace of the less common plants, these being concealed among the dense vegetation. About the middle of July the thistles and other coarse plants were cut down, preventing further diffusion by seed, and the lower plants became more conspicuous. The surface of the cinders was also cleared largely of the vegetation that had grown up irregularly on it, the denser patches (docks, thistles, etc.) being cut, while the sparser growth remained stunted through lack of moisture, and was largely destroyed by traffic on the loose soil near the sidings.

Thus, while the general tendency has been, as in former years, towards the extirpation of the smaller by the ranker species, and to the impoverishment of the flora in this way, this tendency has been checked to a certain extent, and such plants as *Medicago falcata* have become more vigorous and prominent than before. It is curious that other species (e.g. *Hesperis matronalis*), of which only a few plants have appeared on this ground, have held their place without evident gain or loss from year to year.

In the subjoined list all species observed this season have

been enumerated. Where the remarks of last year still apply, the plants are merely named. Where the difference is only in the frequency of occurrence the name is followed by + to denote increase, or by - to denote decrease. Species admitted as indigenous in British floras but not so in the district around Aberdeen are indicated by an asterisk. The names of those not regarded as indigenous anywhere in Britain are printed in italics.

Ranunculus acris, L.—A few plants in a limited area.

R. repens, L.

**Papaver Rhœas*, L.—Two plants on the cinders. The absence from this ground of *P. dubium*, the common cornfield weed near Aberdeen, seems noteworthy.

Cochlearia Armoracia, L.—The same two plants as were noted last year are still growing, but have not flowered. Last autumn the leaves were a good deal eaten by the larvæ of the moth *Pionea forficalis*.

Hesperis matronalis, L.

Sisymbrium pannonicum, Jacq.—Two or three young plants seen in August near where the only one was observed last year.

Brassica Napus, L. -

B. Sinapistrum, Boiss. -

Capsella Bursa-pastoris, Web.

Lepidium Draba, L.—Several flowering stems reappeared on the spot where I found it 1895, probably from buds on roots of the plant removed by me in 1895. The flowers on these stems showed fewer irregularities of floral structure than on the original flowering stems. The plant continues to thrive in my garden.

Viola tricolor, L., and *V. arvensis*, Murr.—Of each a few weakly plants occurred on the cinders.

Silene Cucubalus, Wibel.—One pretty large plant in flower and fruit.

Lychnis alba, Mill.

Cerastium triviale, Link.

Stellaria media, Cyr.—As before, though less abundant near the mills.

Spergula arvensis, L., *b. sativa*, Bann.

Ulex europæus, L.

Cytisus scoparius, Link. }

Mostly killed out by traffic near sidings.

Medicago sativa, L.—Slightly increased.

- **M. falcata*, *L.*—Considerably increased, and flowering very freely.
- **Melilotus officinalis*, *Lam.*—One small plant on cinders.
- Trifolium pratense*, *L.*
- T. hybridum*, *L.*
- T. repens*, *L.*—Slightly increased.
- Lotus corniculatus*, *L.*—One plant, near west end of ground.
- L. uliginosus*, *Schkuhr.*—One fair-sized plant.
- Vicia Cracca*, *L.*
- V. sepium*, *L.*
- Rubus idæus*, *L.*—The larger plants have been cut down with the coarse herbage.
- Potentilla anserina*, *L.* + locally.
- **Pyrus Malus*, *L.*
- Ribes Grossularia*, *L.* -
- **R. nigrum*, *L.*
- **Lythrum Salicaria*, *L.*
- Conium maculatum*, *L.* +
- **Apium graveolens*, *L.* -
- Ægopodium Podagraria*, *L.*—Increasing, but slowly, around the single patch.
- Anthriscus sylvestris*, *Hoffm.*
- Peucedanum sativum*, *Benth. and Hooker.*—One large plant, in fruit.
- Galium Aparine*, *L.*—Considerably increased locally.
- Bellis perennis*, *L.*
- Achillea Millefolium*, *L.* +
- A. Ptarmica*, *L.*—Less common, owing to changes on south side of ground.
- **Anthemis arvensis*, *L.*—Only one or two plants observed.
- Chrysanthemum segetum*, *L.*—Two weak plants.
- C. Leucanthemum*, *L.*
- Matricaria inodora*, *L.*
- Artemisia vulgaris*, *L.*
- Tussilago Farfara*, *L.* +
- Senecio vulgaris*, *L.*
- Arctium minus*, *Bernh.*
- **A. intermedium*, *Lange.*—One pretty large plant showed the characteristic features in July, but it shared the fate of all the larger vegetation. It had not been found here before.

Cnicus lanceolatus, *Willd.* +

C. arvensis, *Hoffm.* +

Centaurea nigra, *L.*

**Cichorium Intybus*, *L.*—One plant observed.

Lapsana communis, *L.*—Not increasing.

Crepis virens, *L.*—Has remained much as last year.

Taraxacum officinale, *Weber.*—Has gained ground in some places.

Sonchus oleraceus, *L.* -

Myosotis arvensis, *Lam.*

**Volvulus sepium*, *Junger* +

Convolvulus arvensis, *L.*—Spreading considerably, and flowering freely.

Solanum tuberosum, *L.*

Mentha viridis, *L.*—Spreading slightly.

Scutellaria galericulata, *L.*—Both patches are spreading a little.

Galeopsis Tetrahit, *L.*—Diminished, by changes along south side of ground.

Plantago major, *L.*

P. lanceolata, *L.*

Chenopodium album, *L.* -

Atriplex patula, *L.* -

Polygonum Convolvulus, *L.* -

P. aviculare, *L.*

P. Persicaria, *L.* -

P. lapathifolium, *L.*—Rather more frequent.

P. cuspidatum.—Three stems observed near the west end of the ground.

Rumex obtusifolius, *L.*, is the commonest dock, occurring in quantities on the cinders.

Urtica dioica, *L.* +

Populus (nigra, L.?)—A single plant has sprung up at the west end of the ground, and has now reached a height of three or four feet. It has, of course, been growing for some time, though not referred to in previous reports.

Alopecurus geniculatus, *L.*

Phleum pratense, *L.* +

Agrostis palustris, *Huds.*, *b. stolonifera*, *Linn.* +

A. vulgaris, *With.* +

Deschampsia cæspitosa, Beauv.

Holcus lanatus, L.

Avena.—As in 1897.

Arrhenatherum avenaceum, Beauv.

Dactylis glomerata, L.

Poa annua, L. —

P. nemoralis, L.—More common.

P. pratensis, L. +

P. trivialis, L.

Glyceria distans, Wahlenb. +

Festuca elatior, L., and *c. pratensis*, Huds.

Bromus sterilis, L.—One plant.

B. mollis, L.

Lolium perenne, L.—Rather more abundant.

e. italicum (Braun).—Several examples.

Agropyron repens, Beauv.—Still increasing, the varieties in proportions as before.

Triticum vulgare, Vill. —

Secale cereale, L. — ; *Hordeum distichum*, L. ; *H. hexastichum*, L.

Equisetum arvense, L.—A fair-sized patch of barren stems was observed in July—for the first time on this ground.

A comparison of the above list with those for previous years confirms the general conclusions stated in them as to the inability of most of the introduced plants to hold their ground against the encroachments of the native weeds, especially of the larger forms, and of those that grow socially, such as *Conium* and the grasses.

The absence of a very large number of the commonest weeds of waste places is still very noteworthy, as is also the continued scarcity of some that have occurred on the ground year after year, and that one might have anticipated would soon become abundant after they had gained a footing. As a whole, the vegetation is year by year becoming more stable in its character, the changes constantly diminishing ; though a few tend to drop out and casuals may not reappear, while others appear for the first time or recur after an interval of a year or more.

Comparing the list of this year with that of 1897 we

find that *Geranium molle*, *G. dissectum*, *Lotus tenuis*, *Potentilla recta*, *Epilobium montanum*, *Carum Petroselinum*, *Scandix Pecten-Veneris*, *Caucalis latifolia*, *Chrysanthemum Parthenium*, *Helianthus tuberosus*, *Lycopsis arvensis*, *Mimulus luteus*, *Laniam purpureum*, and *Carex ovalis* have not been observed in 1898. Of these, several were mere casuals, represented only by one or two examples, while none were at all common. Several species were noted as diminishing in frequency.

On the other hand, some were evidently more abundant. A few observed in the earlier years, but not in 1897, were again found in 1898. These may have been due to casual reintroduction by seed from the mills or brought in the cinders, or some may have been undetected last year. The species that recurred were: *Lepidium Draba*, *Viola arvensis*, *Silene Cucubalus*, *Lotus uliginosus*, *Peucedanum sativum*, *Chrysanthemum segetum*, *Cichorium Intybus*, *Glyceria distans* (almost certainly present in 1897).

The following were observed for the first time: *Lotus corniculatus*, *Arctium intermedium*, *Polygonum cuspidatum* (all single plants), and *Equisetum arvense*. The single example of *Populus*, though not mentioned previously, has been some years on the ground.

REPORT FOR 1899.

THE foregoing report, written in September 1898, has remained unpublished owing to want of room in this journal during the past year; but it appears better to allow it to stand unchanged, and to confine the report for 1899 to those features only of the locality and flora that show conditions changed as compared with those of the previous year.

The railway lines have been increased in number; and both they and the cart tracks to (and in some parts between) them now occupy much of the surface covered with cinders. The latter area has also been extended in some places; and some of the plants previously observed and recorded have been destroyed during the year. In two or three places small rubbish-heaps have been deposited, on

which some plants not previously obtained have been found, while others believed to have disappeared have been again found, probably the result of seeds casually introduced with the rubbish.

The most careful examination made this year was on 22nd June; but several visits were made to the ground both before and afterwards. On that day the coarser grasses and other large weeds, such as thistles and hemlock, were found newly cut down rather closely. They did not regain their former size, or flower and seed as in former years. Thus the lower plants were enabled to grow more vigorously than for some time previously.

The report for 1898 is taken as the basis of the following notes. All species named in that report but not referred to here were observed in 1899 in practically the same quantities as in 1898. All changes of any kind are noted below. The same abbreviations and signs are used as before.

Ranunculus acris, *L.* +

**Papaver Rhœas*, *L.*—Not seen.

Barbarea vulgaris, *R. Br.*—One plant, in flower.

Cochlearia Armoracia, *L.*—One plant much injured by larvæ, the other flowering.

Sisymbrium pannonicum, *Jacq.*—Two or three seedlings were noticed a little distance from its former habitat, but none flowered.

Viola arvensis, *Murray.*—None seen.

Saponaria Vaccaria, *L.*—Several, in flower, on rubbish; last noticed in 1896.

Cytisus scoparius, *Link.*—Seems destroyed.

Malva parviflora, *L.*—Several on rubbish, flowering; last noticed in 1895.

Geranium molle, *L.*—Two flowering plants; last noticed in 1896.

**Medicago falcata*, *L.*—Flowering and fruiting very freely.

**Melilotus officinalis*, *Lam.*—Not seen.

Lotus corniculatus, *L.*—Spreading a little.

L. uliginosus, *Schkuhr.*—Not observed, probably covered up.

Vicia sepium, *L.* +

Potentilla anserina, *L.* +

**Pyrus Malus*, *L.* +

**Lythrum Salicaria*, *L.*—Quite covered with cinders and destroyed.
Conium maculatum, *L.*—Checked by being cut down in June.
Scandix Pecten-Veneris, *L.*—Several plants on rubbish; last seen in 1897.

Peucedanum sativum, *B. and H.*—Not observed, perhaps destroyed.
Caucalis latifolia, *L.*, one; found previously in 1897.

**Sambucus nigra*, *L.*—One young plant on the levelled-up ground near lines.

**Galium tricornis*, *Stokes.*—Several plants in fruit on a rubbish-heap.

Bellis perennis, *L.*—Increasing slightly in opener places.

Anthemis Cotula, *L.*—A good many small plants on a rubbish-heap.

Chrysanthemum segetum, *L.*—Not observed.

Artemisia vulgaris, *L.*—Not observed.

Arctium.—A few plants of this genus were seen, but as they were cut down with the other coarse herbage it was impossible to determine the form with certainty, except one *A. minus*.

Cnicus.—The species were a good deal checked in their luxuriance by being cut down in June.

Centaurea nigra, *L.* +

C. Cyanus, *L.*—A few plants near the mills; last seen in 1896.

Cichorium Intybus, *L.*—Not observed, perhaps covered with cinders.

Sonchus oleraceus, *L.*—Not observed.

S. asper, *L.*—One young plant; last seen in 1895.

Echinosperrum Lappula, *Lehm.*—A few small plants in flower and fruit on rubbish. It had not been previously observed on this ground, though several times found as a casual near Aberdeen.

**Scutellaria galericulata*, *L.*—Both patches covered up and destroyed.

Phalaris arundinacea, *L.*—One patch in flower; last seen in 1896.

Festuca rubra, *L., Thuill.*—A few plants in flower; not previously seen since 1896.

Bromus sterilis, *L.*—Not observed.

An examination of the above notes will show considerable changes when contrasted with those for 1898. Several species have dropped out, viz. *Papaver Rhæas*, *Cytisus scoparius*, *Melilotus officinalis*, *Lotus uliginosus*, *Lythrum Salicaria*, *Peucedanum sativum*, *Chrysanthemum segetum*,

Artemisia vulgaris, *Cichorium Intybus*, *Sonchus oleraceus*, *Scutellaria galericulata*, *Bromus sterilis*. Almost all of these were present in 1898 in only small numbers, except where they grew in clumps that were destroyed by the extension of the area covered with cinders.

The following species observed in former years, but not in 1898, recurred in 1899, chiefly on rubbish-heaps:—*Saponaria Vaccaria*, *Malva parviflora*, *Geranium molle*, *Scandix Pecten-Veneris*, *Caucalis latifolia*, *Centaurea Cyanus*, *Sonchus asper*, *Phalaris arundinacea*, *Festuca rubra*.

The following, also chiefly on rubbish-heaps, had not been previously observed on this ground:—*Barbarea vulgaris*, *Sambucus nigra*, *Galium tricornis*, *Anthemis Cotula*, *Echinopspermum Lappula*.

ON *HIEROCHLOA BOREALIS*, R. & S.,¹ AS A SCOTTISH SPECIES.

By ARTHUR BENNETT, F.L.S.

THE discovery of this species by Miss Mittelbach on the shore of Kirkcudbrightshire makes it perhaps possible that it may be found in other localities; but it must be searched for early, since from the first week in May to the first week in June seems the time in Scotland when this grass is in its best condition. In cultivation of the plant, however, from the Thurso station, I found it begins to flower as early as 13th April, but is at its maximum about the middle of May. It flowers profusely when grown in a pot, but very sparsely in the ground, among *Carex tomentosa*, *Sisyrinchium*, etc.

In this note I propose to give an outline of its history as a Scottish species (with extracts from various sources, letters, etc.), its distribution in Europe, etc.

The first notice of it as a British plant seems to be in Hooker's "Flora Scotica," p. 28, 1821, where it is recorded as "in a narrow mountain valley called Kella, Angus. G. Don. A valuable discovery of the late acute Mr. G. Don; called *Hierochloë* by Gmelin, because in some parts of the

¹ Gmelin, "Fl. Sib.," i. p. 101 (1747), wrote "*Hierochloë*."

Prussian dominions it is dedicated to the Virgin Mary, and strewed before the doors of the churches on festival days. It has, like others of the genus, an agreeable scent, resembling that of *Anthoxanthum odoratum*." Linnæus tells us "it is a soporific, and sold in the towns in Sweden to be suspended over the beds, and induce sleep" (Hooker, *l.c.*, 10th April 1821). In the same year, in the 'Additions and Corrections' to Gray's "Nat. Arr. of British Plants," p. 731, the plant is described under the same name, except that the genus is spelt *Hierochloa*, instead of *Hierochloë* as in Hooker.

In 1828 Sir J. E. Smith ("British Flora," vol. i. p. 110) uses the same name as Hooker, and remarks that he has not examined British specimens. In "English Botany Supplement," t. 2641 (1830), it was figured, and the note added that it was discovered by Mr. G. Don in 1812. In 1847, in the second edition of his "Manual," Professor Babington (p. 378) amplifies the station to "in a narrow mountain valley called Glen Kella (or Cally, near the Spital of Glen Shee)."

In 1848 Gardiner's "Flora of Forfarshire" appeared, and he remarks that the head of the glen had been carefully searched in 1843; and Arnott ("British Flora") says "'minute search' had been made"; but Mr. Druce notes that "one of the searchers afterwards stated that although he had made a careful search, from what he had since learned from Mr. Dick about the flowering of the plant, *i.e.* that it flowers in Caithness early in May, after which it withers, and becomes impossible to find, and considering that his search was made *much later* in the year, he withdraws his previous statement." Gardiner says: "The upper part of Glen Cally has been searched; but it is more likely to occur in the lower portion of the glen, by the stream, than among the rocks at the head" ("Scottish Naturalist," 1884, pp. 268-269).

In the "Annals of Natural History," October 1854, the Thurso station is recorded. The account quoted below was contained in a communication made by Mr. R. Dick to the Botanical Society of Edinburgh in July of the same year. "About ten minutes walk from the town of Thurso there is, by the river side, a farmhouse known by the name of the Bleachfield, opposite to which, on the eastern bank of the

river, there is a precipitous section of boulder clay. Opposite to the clay cliff, and fringing the edge of the stream, any botanist can, in the last week of the month of May, or in the first or second weeks in June, gather fifty or a hundred specimens of *Hierochloë borealis*. Passing upwards along the river bank, and at no great distance, there is another clay cliff, where a few hundreds of *Hierochloë* may be got. It also fringes the edge of the river. But the plant must be looked for at the time indicated; for by the third week of June the beauty of *Hierochloë* has passed away, and by the first of July the herbage has become so rank that the Holy Grass, now ripe, and turned of a silky brown, is completely hidden from view. Further up, between Giese and a section of boulder clay a little below Todholes, the plant may likewise be picked in hundreds. *Hierochloë* has never failed to appear in these localities during the last twenty years."

In the "Phytologist," 1855, p. 117, Mr. J. T. Syme, in some notes on specimens distributed by the Exchange Club, remarks: "But the plant which will be most prized is the long lost *Hierochloë borealis*: for which the Society is indebted to Mr. Notcutt, who received the species from Mr. Dick, its discoverer, near Thurso. Mr. Dick has known the plant in this station for twenty years, but was not aware it had been lost in the original station found by Mr. G. Don. Flowering early in the year, it was no wonder it was passed unnoticed by botanists, who make excursions in autumn, when nothing but the leaves of the plant are visible. It may be expected to occur in other places, if looked for in the end of May or beginning of June."

In the same year (1855) Mr. Gourlie of Edinburgh sent specimens (gathered by Mr. R. Dick) to the Linnean Society.

In 1859 Mr. H. C. Watson, in his "Cybele Britannica," vol. iv. (April 1859), strange to say, does not notice the discovery, either in the Summary of Distribution, p. 221, or in the Census of Species, p. 270. It was not until 1860, in his "Supplement to Cybele Britannica," p. 106, that the Caithness record appears in his books; yet Babington in his fourth edition, p. 390 (1856), and Bentham in his first edition (1858), both duly record it.

In 1861, in Sowerby's "British Grasses," p. 57, Mr.

Johnson states: "It has since been met with in two or three other places in Scotland." I have failed to find on what authority this is based; and Miss Charlotte Gower, who probably could have given some explanation, I do not know where to address, if living?

The plant had now become a recognised Scottish species, and was gathered by Mr. Backhouse, among many others.

For some time before 1880 it had disappeared, or was not found, and on 16th December 1880 Mr. J. Grant wrote: "No one has found the Holy Grass since Dick's time. Thurso river has been searched for [it] again and again, but without success."

In some 'Caithness Botanical Notes' in the "Northern Ensign," 31st January, 1884, Mr. J. Grant remarks: "Of the causes here mentioned (of the disappearance of plants), none will probably account for the disappearance of the Holy Grass from the banks of the Thurso River; and as the reasons for its removal may perchance never be known, we can but designate that mysterious cause the 10th."

In 1885, in 'Botanical Notes of a Tour in Caithness and Sutherland, July 1885,' in the "Journal of Botany," p. 333, Messrs. Fox and Hanbury write: "An evening stroll along the banks of the Thurso River did not yield us the *Hierochloe*, which grows almost opposite the spot where the Caithness Naturalist lies buried. The plant is at all times difficult to be found, and has probably suffered at the hands of collectors; its season, too, was long passed. A single head, however, was gathered about three weeks before our arrival by Mr. A. H. Bremner of Thurso, which he kindly gave us."

On the 11th of June 1888 Mr. J. Grant wrote: "You will be interested to hear that I came on the Holy Grass at last. It was growing below the Cemetery where Dick is buried, and not above it, as Smiles makes out. There were only a few heads, so I did not take any. There is just one left at the place mentioned by Smiles; but Mr. Lindsay informs me there are at least 500 heads of *Hierochloe* on a moist bank several miles up the river."

On the 7th of July this year Mr. Lindsay writes: "The Northern Holy Grass is spreading on the banks of the Thurso River. I have pulled specimens within a hundred

yards of Thurso Bridge, and up four or five miles, this year, and for a number of years back."

This brings the history of the grass to the present summer. I now give the principal references to it, and figures of it in British works:—

- SINCLAIR, "Hort. Gram. Wob.," p. 167 (plate 14), 1825.
 "ENG. BOT. SUPPL." tab. 2641, May 1, 1830.
 BAXTER, "Brit. Phan. Pl.," vol. ii. p. 148, tab. 148, 1835.
 MURRAY, A., "The Northern Flora," p. 57, 1836.
 PARNELL, "Grasses of Scotland," tab. 31, p. 72, 1842.
 "PHYTOLOGIST," 1842, pp. 426, 462; 1843, p. 491; 1855, p. 117;
 1857, p. 36.
 GARDINER, "Flora of Forfarshire," p. 199, 1848.
 WATSON, H. C., "Cyb. Brit.," iii. p. 153, 1852.
 LINNEAN SOCIETY'S "PROC.," 1855, ii. p. 374.
 LOWE, "Nat. Hist. Brit. Grasses," p. 91, tab. 29a, 1858.
 IRVINE, A., "Ill. Handb. Brit. Pl.," p. 197, 1858.
 SOWERBY, "Grasses of Great Britain," p. 57, tab. 48, 1861.
 BENTHAM, "Handb.," illust. ed., p. 949, f. 1148, 1865.
 SYME, "Eng. Bot.," ed. 3, vol. xi. p. 16, tab. 1695, 1872.
 "SCIENCE GOSSIP," 1873, p. 139; 1875, p. 177, with figs. 232, 262;
 1876, pp. 42, 162, 278; 1877, p. 44.
 SMILES, "Life of Robert Dick," pp. 73, 255, 344, 1878.
 DRUCE, "Scot. Nat.," 1884, p. 268.
 BENNETT, A., in "Scot. Nat.," 1888, p. 89.
 "ANN. SCOT. NAT. HIST.," July 1899, p. 185.
 "JOURN. BOT.," 1899, p. 328.

Among others, the following names are given under the species by Richter in "Pl. Europ.," p. 31, 1890:—

- Holcus odoratus*, L., "Sp. Pl.," ed. 1, p. 1048, 1753.
Poa nitens, Weber, "Fl. Holst." supp., n. 6, 1787.
Avena odorata, Persoon, "Syn.," i. p. 100, 1805.
Holcus borealis, Schrad., "Fl. Germ.," i. p. 252, 1806.
Hierochloa repens, Pal. Beauv., "Agrost.," p. 62, 1812.
Hierochloa borealis, R. et S., "Syst.," ii. p. 513, 1817.
Hierochloa odorata, Wahlb., "Fl. Ups.," p. 32, 1820.

Hartmann, "Hand. Sk. Fl.," ed. 11, p. 529, 1879, gives one subspecies and two varieties:—

- β *microstachya*, *l.c.* ed. 5, p. 308, 1849.
 γ *firma*, F. Nyl., "Sp. Fl. Fenn.," ii. p. 1, 1844; and
H. fragrans, R. et S. "Syst.," ii. p. 513, 1817.

Anderson, "Gram. Scand.," p. 110, 1852, gives as a subspecies **setifolia*, Hartm., "Bot. Not.," 1846, and "Sk. Fl.," ed. 5, p. 308, 1849, gathered by A. Luhr in 1846; while he places *fragrans* as a variety. Of these, *firma* is stated by Hjelt, "Fl. Fennica," p. 343, 1895 (on the authority of Hackel), to be merely a form of the species.

Bluff and Fingerhuth, "Consp. Fl. Germ.," ed. 2, i. p. 112, 1846, have a

"*β pedicellis infra spiculum hispidis*, 'Fl. Sil.,' p. 53."

Our plant seems to be fairly typical.

The name comes from the Greek *hieros*, "sacred," and *chloe*, "grass"; hence it signifies "holy grass."

In Iceland it was used for "scenting apartments and clothes" (Hooker).

According to Mrs. Lankester, in English Botany it is also called "Vanilla Grass."

Distribution, principally in Europe:—

Iceland, North and South Norway. Sweden, in 12 provinces.

Finland, generally distributed to 68° 30' (Blom, *ex* Wainio). On the coast it occurs, in South Finland—Aland Isles, Borgio, Lovisa; West Finland—Raumo, Vasa, Neplot, Remi; North Finland—Ponjoj, Svjätöj-noss.

Coast of Pomerania, Prussia.

Coast of Schleswig-Holstein.

East Friesian Islands.

In four of the North Sea Islands.

Holland, Bavaria, Moravia, Bohemia, Hungary, Transylvania, Russia, France (rare), Tyrol (formerly), Switzerland, North America to 62° N. Lat. (Dawson), New Zealand.

Its place is taken in the extreme north, in Nova Zembla, Spitsbergen, etc., by *H. alpina*, R. et S., and *H. pauciflora*, R. Br.

Memorial to the late Rev. Dr. Gordon, Birnie.—We have received the following circular, and desire to bring it before our readers:—BIRNIE, *August* 1899.—At a recent meeting of the Kirk Session of Birnie it was resolved to take steps to raise a Fund to defray the Expenses of Erecting a suitable Memorial in the Church to the memory of the late Rev. Doctor Gordon, who for upwards of fifty years was Minister of the Parish. The Session being aware that Dr. Gordon had many friends and admirers outside the Congregation of Birnie Parish Church, agreed to open the Subscription List to all

such who may wish to contribute towards the object in view. Any contribution you may kindly send will be gratefully acknowledged by—Your obedient servants,

WILLIAM MORRISON, *Treasurer.*

ALEX. MURRAY, *Session Clerk.*

ZOOLOGICAL NOTES.

Lesser Rorqual (*Balenoptera rostrata* (Fabricius)) **in the Firth of Clyde.**—On 7th August 1897 the small steam whaler "Thrasher," belonging to the Cape Fisheries Company, Ltd., while on her trials on the Firth of Clyde, harpooned and killed a whale off Largs. The carcase was towed to Messrs. Caird and Co.'s shipbuilding yard, Greenock, and in an advertisement offering it for sale at £5 it was said to be thirty (30) ft. long. The lips found their way to Paisley Museum, where I recently saw them, and Mr. J. M. B. Taylor, the curator, kindly gave me a photograph of them. From the illustrations accompanying Professor Sir Wm. Turner's article 'On the Lesser Rorqual (*Balenoptera rostrata*) in the Scottish Seas' ("Proc. Roy. Soc. Edin.," 1893, vol. xix. pp. 36-75), I formed the opinion that this was the species of the Largs whale, and on submitting the photograph to Mr. Oldfield Thomas of the British Museum (Natural History), he has favoured me with the following reply: "The whale appears to be the Lesser Pike Whale (*Balenoptera acuto-rostrata*), commonly known simply as *B. rostrata*, though the above is its correct name." (As regards the name, see Mr. Thomas's article in the "Zoologist," March 1898; and also Mr. F. W. True, 'On the Nomenclature of the Whalebone Whales of the 10th edition of Linnæus's *Systema Naturæ*,' in the "Proceedings of the U.S. National Museum, 1898, vol. xxi. pp. 617-635, where a conclusion independently arrived at, but similar to that of Mr. Thomas, is expressed.) So far as I am aware, this is an addition to the known fauna of the Clyde waters, although it is not improbable that whales which we occasionally hear of in the Firth as "finners" may belong to this species.

I would take this opportunity of saying that I shall be glad to receive definite information, with details, regarding Clyde cetaceans and seals, and particularly news of any recent occurrences, as I am endeavouring to ascertain the present *status* of the marine mammalia of our waters.—HUGH BOYD WATT, 101 St. Vincent Street, Glasgow.

The Bottle-nosed Whale in the Clyde.—Judging from the extreme paucity of records of the occurrence of the Common Bottle-nosed Whale (*Hyperoödon rostratus*, Müll.), one might be led to consider it as a rare species in Clyde; but, while little known

to naturalists in this area, it is so frequently seen by yachtsmen as to receive little attention from them. I recorded one in the "Annals," which I saw on exhibition in Greenock in July 1896. One was stranded at a later date on the Argyll side of the Firth, and I have reason to believe that it was correctly assigned to the species above named. On the 8th of June, when steaming up Loch Fyne in Mr. Andrew Bain's ss. "Romany," one was several times seen by our party; and on the following day, in the evening, I watched one, about 20 feet long, for fully half an hour, in Kilchattan Bay, Bute.—JOHN PATERSON, Glasgow.

Bottle-nose Whale (*Hyperöodon rostratus* (Müll.)) at Ayr.—Reports of "Bottle-noses" in the Firth of Clyde are far from infrequent; thus this summer I have heard of them from Loch Fyne, Kilchattan Bay, Fairlie Roads, and Corrie (Arran). Definite records, however, are scarce, so it may be worth stating that on the morning of the 7th September, Mr. Henry Cowan of Ayr found on the North Beach there, and apparently very recently dead, an almost uninjured example of *Hyperöodon rostratus*, which he disposed of to a showman at Ayr, in whose booth I saw it, and took the following measurements :—

		Ft.	Ins.
Length, along dorsal ridge, from tip of beak to notch of tail	.	16	2
" " " " " "	.	9	3
Anterior curve of dorsal fin	.	1	3
Spread of tail from tip to tip in straight line across	.	3	10
Anterior curve of left lobe of tail	.	2	4
" " " " " " left flipper	.	1	6
Tip of beak to angle of mouth	.	1	4
Upper curve of blow-hole	.	0	5

Girth was said to be 6 feet, weight 3 tons, and sex ♀. Forehead sloped upwards from base of beak at a moderate angle only; colour was a uniform solid black, extending, as far as I could see or was informed, to the underparts also.—HUGH BOYD WATT, Glasgow.

The White-sided Dolphin off the East Coast of Scotland.—A damaged skull of *Lagenorhynchus acutus* was dredged and brought to Aberdeen by trawlers; and as the hyoid bones and cartilages and the ear bones were still in position, I conclude that the specimen was not an old one. This species is seldom found on the Scottish coasts, so I thought it worth recording in the "Annals." The skull measured :—

		Inches.	
Length, including lower jaw	.	16	
Breadth, behind orbits	.	9	
Height	.	7½	
Length of lower jaw	.	13	

This species of Dolphin is easily distinguished from the White-beaked Dolphin, *Lagenorhynchus albirostris*, by its narrower and

less massive skull, narrower anterior and posterior nares, arched orbits, much smaller tympanic bones, and by its much smaller and more numerous teeth—the lower jaw has 32 teeth on each side, the upper jaw is broken.—WM. TAYLOR, Lhanbryde.

Blue Shark (*Carcharius glaucus*) at Ayr.—At the same place as the Bottle-nose Whale recorded above I also saw a specimen of the Blue Shark which had been captured in Ayr Bay by Wm. Morrison, fisherman, in his nets on the 6th September. It measured :—

	Ft.	Ins.
Length, from nose to tip of upper lobe of tail-fin	8	6
Anterior curve of upper lobe of tail-fin	1	18
„ „ pectoral fin (right side)	1	4

HUGH BOYD WATT, Glasgow.

Pied Flycatcher at Peterhead.—In the early summer, two specimens of the Pied Flycatcher were taken at Grange Gardens; several other birds answering to the description of the Pied Flycatcher were seen along by the Convict Prison at the same time.—WILLIAM SERLE, Musselburgh.

Albino Magpie near Peterhead.—A nearly pure white specimen of the Magpie has been seen for some time on the farm of Clubs-cross, July. Nearly twenty years ago one frequented this district for a considerable time: the older people are always ready to talk about it yet.—WILLIAM SERLE, Musselburgh.

Peculiar Variety of Jackdaw near Edinburgh.—To-day, 29th August, when between Craigleith and the Dean House, I noticed a peculiarly marked Jackdaw in a little flock of Daws. Fortunately I had my binoculars in my pocket, so with them I watched it for some time. It was cream-coloured on the body, shading into light chocolate on the wing-coverts; its forehead and cheeks were dark ashy blue.—WILLIAM SERLE, Musselburgh.

Rose-coloured Starling at North Berwick.—On the morning of the 26th of July, a Rose-coloured Starling (*Pastor roseus*), well known to Anglo-Indians as the Cholum or Jowarree bird, was seen on the lawn of my house here. It remained feeding for a few minutes, when something frightened it, and it flew away. I had, however, a good view of it through a field-glass, and am satisfied as to the identity of the bird, with which I was familiar in India. It was in adult plumage.—WILLIAM LOUDON, North Berwick.

The White Wagtail (*Motacilla alba*) in Ayrshire.—The White Wagtail was not included in Gray and Anderson's paper 'On the Birds of Ayrshire and Wigtownshire' ("Proc. Nat. Hist. Soc. Glasgow," vol. i.). Of its regular occurrence in Ayrshire at the present time, however, there cannot be any doubt. I first met with it on 8th May

1897, on the shore, near Portincross, West Kilbride, a single bird only coming under observation on that occasion. In the present year, on 13th May, when walking from Ardrossan by the shore to Seamill with my friend Mr. John Robertson, we saw not less than twenty, but on going over this same part of the shore on the 5th of June, on which occasion I extended the walk twice the distance by continuing it to Fairlie, no White Wagtail came under notice. Between the dates last named (on 21st May) I had had a walk over the sands between Irvine and Troon, and saw one White Wagtail there. Mention of Irvine Sands brings to my recollection that the late Morris Young told me he had found the White Wagtail nesting there. Young's statement was quite categorical. It was not included in Messrs. Barr and Craig's 'List of the Birds of Beith,' published in the "Western Supplement" in May 1894, but it was shortly afterwards included, having been identified by them on 20th April 1895 or 1896. I cannot be sure of the year at the moment of writing. A "large flock" was seen by them on 6th May 1898 at Kilbirnie Loch, and it was first seen by the same observers this year on 3rd May, also at the locality just named.—JOHN PATERSON, Glasgow.

King Eider in St. Andrews Bay.—Mr. R. Canch writes me as follows:—"John Lonie, my brother's man, first saw the bird in the Eden in company with some breeding Eiders; the smallness of the bird and the beak-tubercle drawing his attention. On the 6th June he shot the bird, and it proved to be a King Eider drake in full adult dress. Lonie stuffed the bird, and tried to sell it. I purchased the specimen from him; but, not caring for the manner of stuffing, I had it re-stuffed."—J. A. HARVIE-BROWN.

Great Shearwaters at St. Kilda.—It may be remembered that a specimen of *Puffinus major*, now in the Edinburgh Museum, was taken within a mile of St. Kilda on 7th August 1897. When at St. Kilda on 11th August 1899, two skins of *P. major* were awaiting me. These birds were both killed during the last week of July 1899, on different days and on different sides of the island, and about a mile from it: one was close to Levenish Rock. No others were seen.—HENRY EVANS, Jura Forest.

[To the above notes Mr. Evans adds: "I saw two of them flying between Barra Head and St. Kilda, about four miles from Barra Head, on the 11th June 1899."—J. A. HARVIE-BROWN.]

Nyssia zonaria, Schiff., in the Inner Hebrides.—Among a number of insects and other objects of natural history recently brought to me by Mr. R. Godfrey for identification, I was delighted to find an unset example of the male of this local moth, which had been captured by Mr. James Baxter on the island of Tiree, Inner Hebrides, in April of the present year. The larvæ of this species

are said to have been common in 1847 on a hill in Skye, and on "Bernarah"; but apparently only one of those taken reached maturity—it was a female, which is wingless ("Zoologist," 1847 and 1849). I know of no other record of the occurrence of *Nyssia zonaria* in Scotland.—WILLIAM EVANS, Edinburgh.

Acherontia atropos in Solway.—We have had a very remarkable and altogether unprecedented series of occurrences of the larvæ of the Death's-head Moth in Kirkcudbrightshire. The first was picked up at Kirkbean village on 12th August. The following week no fewer than fourteen fine larvæ were found feeding upon the leaves of a ti tree (*Lycium barbaræ*) growing against the front of a house at Rockcliffe on the coast of Colvend parish. On 26th August another larva was captured at Kirkandrews in Borgue, which is also, be it observed, a seaside parish. Two individuals were picked off bushes of lilac in the vicinity of Maxwelltown on 30th August and 3rd September respectively. They were fully half a mile apart. The last occurrence that has come to my notice is a larva, also from Colvend, but found miles away from the Rockcliffe examples. Thus nineteen larvæ have been got to my certain knowledge. I have previously recorded the taking of the larvæ of *A. atropos* in Solway ("Annals," 1897, p. 257) as a most uncommon event; and although Mr. Taylor, with reference thereto, has made ("Annals," 1898, p. 118) some singular statements as to the unique habit *atropos* larvæ have in Renfrewshire of harbouring in potato-pits (!), it seems to me that the authenticated finding of caterpillars of this species in Scotland is a contribution of value in the geographical distribution of this insect. I am strongly of opinion that it is only at wide and infrequent intervals that a combination of favourable meteorological conditions together with an immigration of these great moths may take place, so as to account for the simultaneous appearance of larvæ over such a wide extent of country as I have detailed above. From the latter half of May till past mid-June we had extremely fine hot weather. During the earliest days of that hot wave very numerous individuals of the Humming-bird Moth put in an appearance throughout Solway. It was quite a sight to observe scores of them at the flower trusses of the rhododendrons. In early August only a few were seen, but since May these pretty and interesting moths have flown continuously, and on some hot days lately they were quite numerous again. I cannot help correlating the appearance this season of *A. atropos* and *M. stellatarum*. I should have the utmost difficulty in believing that the imagos of *M. stellatarum* that have been so abundant most of the summer were Scottish bred. Did any one observe their larvæ? Similarly the larvæ of *A. atropos* that are now recorded can hardly be other than the produce of immigrant females.—ROBERT SERVICE, Maxwelltown, Dumfries.

Hawk-moths in Moray.—A larva of the Death's-head Moth, *Manduca (Acherontia) atropos*, L., almost full grown, was found on 4th September last by a woman working in the garden at Earnside, near Forres. Not knowing what to do with it, she put it into boiling water! Another larva of the same moth was found at Alves, which is not far from Earnside, on 8th September, by Mr. Scott, carpenter. A fine specimen of the Convolvulus Hawk-moth, *Phlegethontius (Sphinx) convolvuli*, L., was taken by Mr. Gill on 8th September at Bishopmill, near Elgin.—HENRY H. BROWN, Rosefield, Elgin.

Humming-bird Hawk-moth in Moray.—In addition to the Scottish records noted in the July number, it should be mentioned that Mr. Gordon Taylor captured a specimen of this moth (*Macroglossa stellatarum*) at Bishopmill, near Elgin, about 20th June.—HENRY H. BROWN, Rosefield, Elgin.

Stenhelia blanchardi in the Firth of Forth.—I was examining recently a small sample of dredged material from the "Fluke Hole" (off St. Monan's), Firth of Forth, collected in 1896. Several interesting, though familiar, Crustaceans were observed, and amongst them was this Copepod. *Stenhelia blanchardi* (T. and A. Scott) was obtained amongst some material dredged off Arisaig, Argyllshire, in 1892, and was described and figured in the "Annals and Magazine of Natural History" for November 1895. So far as I know, the present is the only other occasion on which this species has been observed. It is quite a distinct species: the secondary branches of the fifth pair of thoracic feet in the female possess at the apex a lateral process exteriorly that assumes a hook-like form, and it is the only *Stenhelia* I am acquainted with in which the secondary branches of the fifth feet are so modified.—T. SCOTT, Aberdeen.

BOTANICAL NOTES AND NEWS.

Notes on the Flora of Wigtownshire.—As supplementary to Mr. G. C. Druce's paper on the 'Flora of Wigtownshire' in "Annals of Scottish Natural History" for January 1899, and to Professor Trail's notes thereon, I would desire to add the following:—*Rubus nessensis*, Anders., *Rubus Scheutzii*, Lind., and *Rubus Selmeri*, Lind., are additional new records for Wigtownshire, *i.e.* additional to my list. *Daucus maritima = gummifer*, Lam., likely is from Hooker and Arnott's "British Flora," but probably a mistake. *Saxifraga oppositifolia* is in 72 (Gray Mare's Tail) but not in 74. *Inula Helenium* is an outcast or escape. *Pulmonaria officinalis* has no record for 74. Without doubt both *Sedum rupestre* and *Carex*

pendula, and also *Osmunda regalis*, are all planted at Lochnaw, though I have gathered *Carex pendula* in 74 in at least two stations, and *Osmunda regalis*, once frequent and plentiful, can yet be gathered in certain localities. The following are not yet recorded for 74:—*Leontodon hispidus*, *Senecio viscosus*, *Ulex nanus* (but *Gallii* is in abundance), *Hypericum hirsutum*, *Reseda luteola*, *Viola odorata*, *Prunus domestica*, *Callitriche verna* (but almost certain to occur), and *Epilobium tetragonum*. *Dianthus deltoides*, *Saponaria officinalis* (*Saponaria Vaccaria* in 72), and *Tanacetum vulgare* were recorded by the late Rev. George Wilson, Glenluce, but are outcasts or escapes. *Leontodon hirtus*, *Ranunculus auricomus*, *Aquilegia vulgaris*, “Trans. Phil. Soc. Glasgow,” 1841-44, vol. i.), and *Stellaria palustris* (almost certain). The following plants have yet to be recorded or re-discovered for 74, though the majority of them occur in the neighbouring counties:—*Lepidium campestre*, *Viola lutea*, *Galium Cruciatum*, *Stachys Betonica*, *Ranunculus Lingua*, *Ranunculus arvensis*, *Erysimum alliaria*, *Cardamine amara*, *Genista anglica*, *Silene inflata*, var. *puberula*, *Geranium sylvaticum*, *Chrysosplenium alternifolium*, *Myosotis collina*, *Carex riparia*, *Cicuta virosa*, *Cenanthe fistulosa*, *Sambucus Ebulus*, *Valeriana dioica*, *Lathyrus sylvestris*, *Carduus heterophyllus*, *Anthemis nobilis*, *Vaccinium Vitis-Idæa*, *Galeopsis versicolor*, *Rumex Hydrolapathum*, *Scirpus sylvaticus*, *Blysmus compressus*, *Phleum arenaria*, *Lepturus filiformis*, *Limosella aquatica* (almost certain), *Rumex sanguineus*, *Brassica monensis*, *Parietaria officinalis*, *Malaxis paludosa*, *Melica nutans*, etc.—JAMES M'ANDREW, New Galloway.

Mistletoe in Scotland.—I am informed, although I have not seen it, that Mr. H. D. Geldart has an interesting paper on ‘Mistletoe, its Hosts and Distribution in Great Britain,’ in vol. vi. part 5, of the “Transactions of the Norfolk and Norwich Naturalists’ Society,” and that he alludes to its presence in Scotland not as a native, but introduced. Now it is quite possible that mistletoe was once indigenous in Scotland, and disappeared with other woodland flora and fauna in the process of excessive denudation. One thing is certain, that there is nothing inimical to the plant in the climate of Scotland, because when sown properly it grows luxuriantly. I have sown it abundantly here on apple, hawthorn, poplar, and lime, and there are many large plants on the two kinds of trees first named. Of the two last I cannot speak as yet. I have forgotten where the seeds were placed on the limes; the poplars were only treated three years ago,—several scores of them,—and it requires a ladder to examine them, which cannot be done till the leaves are fallen.

The mistletoe has been established on apple trees for many years at Loch Ryan House in this county (Wigtownshire), and at Comlongan Castle, Dumfriesshire.

The mode of propagation is very simple. Do not cut any

notch; simply squeeze the berry on the smooth bark of first or second year twigs; the seed adheres by the viscous matter in the berry. The following summer a green shoot like a small caterpillar may be seen: this bends downwards, and seems to enter the bark, disappearing altogether the following winter. Then the twig of the host begins to swell; it may be one year, or two or even three years before the mistletoe reappears with a brace of small leaves, after which growth is rapid. One small apple tree in my garden carries two huge bunches, which threaten ultimately to destroy their host.—HERBERT MAXWELL.

Wilson's Filmy Fern on Foula.—On the 25th May last, while climbing the steep hillside on Foula towards the Kaim in company with Mr. P. G. Ralfe, we found, under large boulders, and growing among the moss, many plants of *Hymenophyllum Wilsoni*.—FRANK S. GRAVES, Ballamsar, Alderley Edge, Cheshire.

CURRENT LITERATURE.

The Titles and Purport of Papers and Notes relating to Scottish Natural History which have appeared during the Quarter—July-September 1899.

[The Editors desire assistance to enable them to make this Section as complete as possible. Contributions on the lines indicated will be most acceptable and will bear the initials of the Contributor. The Editors will have access to the sources of information undermentioned.]

ZOOLOGY.

WILD CAT IN ARGYLLSHIRE. D. A. Maccoll. *The Field*, 5th August 1899, p. 234.—A specimen captured on, or in the vicinity of, Craig Deer Forest, Glen Orchy, a few miles to the north of Loch Awe.

LARGE SEAL IN ORKNEY. Geoffrey Ellis. *The Field*, 2nd September 1899, p. 401.—Specimen of gray seal (*Halichærus grypus*) shot during the second week of August, weighing 370 lbs. and measuring about 7 ft. in length. An editorial note refers to other large specimens.

PIED FLYCATCHER IN SHETLAND. Wm. Eagle Clarke. *The Field*, 8th July 1899, p. 84.—Corrects a statement in *The Field* for 24th June (p. 907) to the effect that the species had not been met with until this year in these islands, and draws attention to the record in the *Annals*, 1898, p. 178, of its occurrence at Dunrossness on 30th April 1898. The note refers also to the Ortolan Bunting.

PROTECTION OF PLOVERS' EGGS. "B. G. J." *The Field*, 15th July 1899, p. 100.—Refers to the scarcity of the Plover in Forfarshire, and expresses regret that the eggs of the species are not protected by law in this county.

NESTLING SNIPE IN JULY. Dalziel MacKenzie. *The Field*, 29th July 1899, p. 227.—Two birds just hatched found on a nest near Farr, Inverness, on 23rd July.

BEWICK'S SWAN IN SOUTH UIST. Donald Guthrie. *The Field*, 12th August 1899, p. 315.—Six birds reported as remaining during the summer.

LATE GROUSE NEST. "W. F. L." *The Field*, 26th August 1899, p. 394.—A hen found sitting on three eggs on the Strontian shooting, Argyllshire, on 17th August.

HEBRIDAL SMELT OFF ARRAN. W. B. Tegetmeier. *The Field*, 26th August 1899, p. 394.—Specimen caught by Mr. H. Knox Dicks in Brodick Bay on 18th August 1899.

THE INVERTEBRATE FAUNA OF THE INLAND WATERS OF SCOTLAND—REPORT ON SPECIAL INVESTIGATION. By Thomas Scott, F.L.S. *17th Ann. Rep. Fishery Board for Scotland*, pt. iii. pp. 132-204, pl. vii. (July 1899).—This valuable paper is a description of the results of a special investigation of eleven Scottish lochs. Each of the lochs is described, and temperature observations, lists of pelagic entomostraca and shore invertebrates given. A general list is appended (pp. 182-185) of all the Crustacea and Mollusca recorded in the previous pages, showing in which lochs they were observed. The paper concludes with notes on some of the species mentioned in the general list.

REVISION OF BRITISH MOLLUSCA. By the Rev. Canon A. M. Norman, M.A., D.C.L., LL.D., F.R.S., etc. *Ann. and Mag. Nat. Hist.* (7), vol. iv. pp. 126-153 (August 1899).—The present instalment, which is the last, "brings the list of British Mollusca on the descending arrangement as far as the Cerethiopsidæ." A large number of Scottish records are given.

NOTES ON RECENT GATHERINGS OF MICRO-CRUSTACEA FROM THE CLYDE AND THE MORAY FIRTH. By Thomas Scott, F.L.S. *17th Ann. Rep. Fishery Board for Scotland*, pt. iii. pp. 248-273, pls. x-xiii. (July 1899).—Notes are given on forty-four species of Copepoda, five of which are described as new, and two of which form the types of new genera. Brief notes are also given on several species of Amphipoda, Isopoda, Cumacea, and Schizopoda.

CONTRIBUTIONS TO FOSSIL CRUSTACEA. By Professor T. Rupert Jones, F.R.S., F.G.S., and Henry Woodward, LL.D., F.R.S., F.G.S. *Geol. Mag.*, Dec. IV. vol. vi. pp. 388-395, pl. xv. (September 1899).—The following Scottish species are described and figured as new:—*Hibbertia orbicularis*, Burdiehouse, and *Anthrapalæmon glaber*, Kilmairs, Ayrshire. Both are from the Coal Measures.

EREBIA ÆTHIOPS (BLANDINA) IN THE ISLE OF SKYE. G. W. Kirkaldy. *Entomologist*, vol. xxxii. p. 236 (September 1899).—

Reports the species as not uncommon, on the first day of August, near a stream running into the sea between Staffin and Portrigh (Portree). Five other species of Butterflies are mentioned, one from the Pass of Brander, near Loch Awe.

EXTRAORDINARY ABUNDANCE OF *MACROGLOSSA STELLATARUM* (at Galashiels). James C. Haggart. *Entomologist*, vol. xxxii. p. 187 (July 1899).

NOTES ON THE ADDITIONS TO THE BRITISH LIST OF COLEOPTERA SINCE CANON FOWLER'S "COLEOPTERA OF THE BRITISH ISLES" (*continued*). By Horace Donisthorpe, F.Z.S., F.E.S. *Ent. Record*, vol. xi. pp. 184-186 and 216, 217 (July and August 1899).—The following species and localities are given:—*Helophorus obscurus*, ab. *Shetlandicus*, Kuwert, Shetland Isles; *H. griseus* ab. *bulbipalpis*, Kuwert, Shetlands; *Quedius riparius*, Kelln., Beauly, Inverness; and *Telephorus figuratus*, ab. *cruachanus*, Chitty, near Ben Cruachan.

ABERDEENSHIRE FORM OF *TRICHIURA CRATÆGI*. Arthur Horne, F.E.S. *Ent. Record*, vol. xi. p. 191 (July 1899). A note describing the northern variety of this insect.

COLEOPTERA IN SCOTLAND. Theodore Wood. *Ent. Mo. Mag.* (2), vol. x. p. 214 (September 1899).—Nine species are referred to.

QUEDIUS TRISTIS, GRAV., IN SCOTLAND. T. Hudson Beare. *Ent. Record*, vol. xi. p. 242 (September 1899). Found in numbers under stones on Arthur's Seat and at North Queensferry in July 1899.

TWO ADDITIONAL BRITISH SPECIES OF *ANDRENA*. By Edward Saunders, F.L.S. *Ent. Mo. Mag.* (2), vol. x. pp. 154, 155 (July 1899).—One of the species referred to is *A. ruficrus*, Nyl., and the specimens are those recorded in the *Annals* by Mr. Evans (see p. 158).

PHILOPOTAMUS MONTANUS, VAR. *CHRYSOPTERUS*, ON THE PENTLAND HILLS. Kenneth J. Morton. *Ent. Mo. Mag.* (2), vol. x. p. 157 (July 1899).—Two examples taken at a streamlet near the source of the Logan Burn on 17th April.

NOTES ON *ÆSCHNA CÆRULEA*, AND *SOMATOCHLORA ARCTICA* AND *METALLICA*, IN INVERNESS-SHIRE. By James J. F. X. King, F.E.S. *Ent. Mo. Mag.* (2), vol. x. p. 206 (September 1899).

BOTANY. †

CRITICAL NOTES ON SOME SPECIES OF *CERASTIUM*. By Frederic N. Williams, F.L.S. *Journ. Bot.*, 1899, pp. 310-315.—The only Scotch *Cerastium* referred to is *C. Edmonstoni* (H. C. Watson, as variety, Murbeck and Ostfeld, as species), which is regarded as identical with *C. arcticum*.

ALSINE IN THE BRITISH FLORA. By W. P. Hiern, M.A., F.L.S. *Journ. Bot.*, 1899, pp. 317-322.—Deals with nomenclature, but the

reader must be referred to the original article to understand the value of the changes advocated in it.

SAGINA APETALA IN WESTERNNESS? By W. F. Miller. *Journ. Bot.*, 1899, p. 36.—Advises that the record in *Journ. Bot.*, 1895, p. 345, should be regarded as in need of confirmation.

HIEROCHLOË BOREALIS IN KIRKCUDBRIGHTSHIRE. By Arthur Bennett, F.L.S. *Journ. Bot.*, 1899, p. 328.—Refers to the discovery reported in our last issue.

BRYOLOGICAL NOTES FROM THE WEST HIGHLANDS. By H. N. Dixon, M.A., F.L.S. *Journ. Bot.*, 1899, pp. 300-310.—Is an important paper, with records new to various districts, and even to Scotland.

NEW AND RARE SCOTTISH HEPATICÆ. By W. H. Pearson. *Journ. Bot.*, 1899, pp. 274-275.—Enumerates three new to Scotland, and twelve others new to West Inverness, collected by Mr. S. M. Macvicar.

HEPATICÆ OF MOIDART, WEST INVERNESS. By Symers M. Macvicar. *Journ. Bot.*, 1899, pp. 348-356.—Is an exhaustive list, with localities of all species found by the author. It includes numerous new records.

REVIEWS.

THE CAMBRIDGE NATURAL HISTORY. INSECTS. Part II. By David Sharp, M.A., M.B., F.R.S. (London: Macmillan and Co., Ltd., 1899.)

Dr. Sharp is to be congratulated on the completion of his treatise on Insects, which occupies the greater part of the fifth and the whole of the sixth volumes of this estimable *Natural History*. We were very favourably impressed with *Insects*, Part I, which appeared some four years ago, and our estimation of the author's ability as a clear and careful expounder of his subject has certainly not diminished on perusal of the volume now before us. The whole treatise is quite a masterpiece in its way. While giving a vast amount of detailed information on the various groups, yet the style is sufficiently lucid to render the book an eminently readable one. Add to this the excellence and profusion of the illustrations and the elegance of the printing, and we are led at once to remark that it is certainly the most acceptable introduction to the science of Entomology in the English language, or at any rate to the subject treated from the systematic standpoint. The volume just published treats of the Hymenoptera, Tubulifera, and Aculeata, the Coleoptera, Strepsiptera, Lepidoptera, Diptera, Aphaniptera, Thysanoptera, Hemiptera, and Anoplura. The various groups of

Bees are elucidated in a particularly interesting manner, including a detailed account of the anatomy of the proboscis of *Bombus*. The sections devoted to Wasps' Nests, Features of Ant-life, Structure of the Imago in Lepidoptera, Blood-sucking Diptera, Vocal Structures of the Cicadidæ, and Parthenogenesis in the Aphidæ and Coccidæ, are also worthy of special notice. It is difficult, however, to particularise, as the numerous groups of Insects are looked upon with varied degrees of interest by different readers. We can only say that all are *well* treated of, and both volumes can be thoroughly recommended as containing an invaluable summary of our present state of entomological knowledge.

P. H. G.

FLORA OF CUMBERLAND, containing a full list of the flowering plants and ferns to be found in the county, according to the latest and reliable authorities. By William Hodgson. With a Map of the County. (Carlisle: W. Meals and Co., 1898.) Pp. xxxvi. and 398.

The appearance of this Flora was looked forward to with considerable interest, since it treats of a very charming district which is well known to all English pedestrians, and it was known that it comprised many local plants, and that the highest English mountains were to be found in the area it embraced.

In this volume Mr. Hodgson has given the results of his arduous labours; and he must be congratulated on filling up another gap in the list of counties of England of which there were no published Floras.

Each compiler of a county Flora has his own idea as to the manner in which a Flora shall be written, and therefore considerable latitude must be given to the authors of such works; but there appears to be a consensus of opinion on certain points. Among these are, that a Flora, to be complete, should contain, as far as possible, all the references which have appeared in botanical literature to the plants of a county. In this respect the authors of the "Flora of Middlesex" set a noteworthy example of general excellence. Then, a local Flora should give the general reader some idea of the frequency or otherwise of the plants which occur in the area treated of, the kinds of soil or geological formations on which they occur, and the times of flowering in the county; and in these respects the excellent Floras of North-West Yorkshire and Herefordshire are good instances.

The altitudes of the chief lakes and tarns would also have been useful and interesting. Some of the misprints are curious. The use of capitals in the specific names follows no rule, and the absence of them in the text for the genera is not a pleasing innovation.

The "Flora" proves that there is an immense amount of work still to be done in the Cumberland hills, and we must thank Mr. Hodgson for having given us this important contribution towards the history of their flora.—G. CLARIDGE DRUCE.

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